



Towards **transformation**
of the **development model**
in Latin America and
the Caribbean: **production,**
inclusion and sustainability



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Contents

Foreword	11
Chapter I	
The present and future of globalization: crises, environmental emergency and technological revolution	15
A. Crises and changes in globalization	17
1. The global financial crisis of 2008–2009: a turning point.....	19
2. Tensions between the three “global factories”	21
3. Steady growth in international migration flows	26
4. The dissatisfaction of the middle-income strata.....	28
5. The health crisis laid bare the acute differences among regions and countries.....	30
B. A resurgence in inflation, across the board.....	32
1. A worldwide trend	32
2. Interaction of supply and demand factors	33
3. Central banks’ strategy: normalizing monetary policy	34
C. The environmental emergency is magnifying the effects of the economic and social crisis	35
1. Climate change	35
2. Degradation and loss of biodiversity and ecosystem services	38
D. From the connected economy to the digitalization of the economy	39
E. From an efficiency rationale to a geopolitical rationale: the future of globalization	45
Bibliography.....	47
Chapter II	
Production structure and policies for sustainable development	51
Introduction	53
A. Patterns of structural transformation and growth: a comparative analysis	54
1. Productive diversification, new capabilities and trade growth.....	54
2. Not all sectors are equal: Schumpeterian efficiency and Keynesian efficiency.....	56
3. Schumpeterian efficiency and Pavitt’s typology	57
4. Demand is not equally dynamic in the different sectors.....	60
5. Increasing returns from the interaction between technology and demand growth	62
6. Keynesian efficiency and economic growth	64
7. Differences in the international trade position of different subregions in Latin America and the Caribbean	65
8. The production structure and greenhouse gas emissions: structural change can also bring environmental benefits	67
9. The Caribbean: a region heavily exposed to the impacts of climate change	71

B. There are no growth miracles, but long-term policies can redirect incentives to the most dynamic sectors.....	73
1. Debt and investment: a more unstable global economy with less resilient national economies.....	73
2. Macroeconomic policy, competitiveness and premature deindustrialization.....	78
3. Industrial and technology policy.....	81
4. Less complex structures mean less resilience to crises.....	91
Concluding remarks.....	93
Bibliography.....	94
Chapter III	
Inequality, employment and social policy.....	99
Introduction.....	101
A. The production structure as a barrier to the creation of higher-productivity jobs.....	101
1. Rigidity of the production structure versus labour market flexibility.....	102
2. Employment, productivity and wages.....	103
B. The burden of structural heterogeneity: informality in total employment.....	106
1. Structural heterogeneity.....	106
2. Informality and crises.....	107
3. Informality is multidimensional.....	107
4. New forms of informality.....	109
C. Middle-income sectors at risk: the pressures of hyperglobalization and the vulnerability of those left behind.....	110
1. Evolution of the middle-income strata in Latin America over the past two decades.....	110
2. Towards a new social contract: the role of middle-income strata.....	111
D. Migration: a window of opportunity and a reflection of development imbalances.....	112
1. The positive impact of migration on countries of origin and destination.....	113
2. Vulnerability and inequality.....	113
E. Climate change has distributional effects and accentuates inequalities within and between countries.....	116
1. A fundamental asymmetry: external and internal dimensions.....	116
2. Climate change and poverty.....	119
F. Social spending: recent boost and challenges for continuity.....	120
1. Evolution of social spending and the importance and impact of transfers during the crisis.....	121
2. Emergency transfers: the challenge of sustainability.....	123
Concluding remarks.....	125
Bibliography.....	125
Annex III.A1.....	129
Chapter IV	
Sectoral considerations: drivers of sustainable development.....	131
Introduction.....	133
A. The energy transition to tackle the environmental and geopolitical crisis.....	133
1. The growing competitiveness of renewable and clean energy.....	133
2. The nascent green hydrogen industry.....	136
3. Lithium in the energy transition.....	140
B. Opportunities in the growing e-mobility market.....	144
1. Mexico in the North American light electric vehicle production chain.....	145
2. Brazil: a window of opportunity for manufacturing electric buses.....	147
3. Policy recommendations.....	152
C. The circular economy: a cross-sector strategy.....	153
1. The circular economy as a tool for sustainability.....	153
2. Policy recommendations.....	158
D. The bioeconomy: sustainable agriculture, genetic resources and bio-industrialization.....	159
1. Economic importance and characteristics of the bioeconomy.....	159

2.	The sustainable use of biodiversity and genetic resources	161
3.	Synthetic fertilizers and organic fertilizers.....	162
4.	Opportunities for bioindustrialization	167
5.	Policies for the use of genetic resources and the production of agricultural bioinputs	168
E.	Health-care manufacturing industry: progress towards self-sufficiency in health matters	170
1.	How regional priorities have evolved amid the COVID-19 pandemic	170
2.	Characteristics and recent performance of the regional pharmaceutical industry.....	171
3.	Development and progress of the plan for self-sufficiency in health matters	176
F.	Digital transformation.....	179
1.	Connected economy: universalizing access and deploying new networks	180
2.	Digital economy: an innovation boom in the region.....	185
3.	Digitalized economy: Industry 4.0 for the transformation of productive sectors	187
4.	Lines of action for digital transformation and inclusion	189
G.	The care economy: creating jobs with equality.....	192
1.	The structural challenges of gender inequality	192
2.	The COVID-19 crisis aggravated gender inequality.....	193
3.	The economic valuation of unpaid work demonstrates its galvanizing potential.....	197
H.	Sustainable tourism for job creation	200
1.	The regional vision.....	200
2.	The tourism sector in Central America and Mexico	202
3.	The situation of the tourism sector in the Caribbean.....	206
4.	Towards a sustainable tourism.....	208
I.	Harnessing the potential of MSMEs and the social and solidarity economy	209
1.	MSMEs: informality and productivity gaps	210
2.	Concentration and geographic distribution of microenterprises.....	213
3.	Social and solidarity economy	215
4.	Policies for productivity and inclusion	217
J.	Conclusions: towards industrial policies with sectoral and cross-cutting actions	220
	Bibliography.....	221

Chapter V

	Policies to transform the development model	229
A.	A big push for sustainability	231
B.	Development planning for policy coordination.....	236
C.	Macroeconomic policies to accelerate growth and address inflation	237
1.	Monetary policy: use of all available instruments	237
2.	Fiscal policies to boost investment and growth.....	243
3.	Financing for development.....	245
D.	Consolidating welfare states for a sustainable future.....	247
1.	Toward less unequal societies and a just transition to sustainability.....	247
2.	Social protection systems in an era of uncertainty.....	249
3.	Labour inclusion: the key to closing inequality gaps old and new.....	250
4.	Closing the education gap that was exacerbated by the pandemic	251
5.	Guaranteeing the rights of particularly vulnerable populations	253
E.	Care systems: a pillar of rights-based welfare states	256
1.	A State for a care society	257
2.	Public policies for a care society	257
3.	Participatory, inclusive and transformative compacts for a care society.....	260
F.	Mitigation and adaptation to the environmental emergency	260
1.	A change in relative returns.....	260
2.	Strengthening environmental democracy.....	263

G.	New approaches to natural resource governance	264
1.	Strategic transitions in natural resource governance	264
2.	Fiscal and sectoral policies for transition.....	265
H.	Implementing industrial and technological policies.....	266
1.	Extending the scope of industrial policy	266
2.	Cross-cutting guidelines for a new industrial policy agenda.....	267
3.	Toward policies guided by goals and targets.....	268
I.	Regional integration in the new geopolitics of globalization.....	272
1.	A region at odds with global trends	272
2.	Toward more resilient, efficient and sustainable regional infrastructure	273
3.	Digital cooperation for regional production.....	273
4.	Convergence for productive integration	274
J.	Conclusions: the path forward.....	275
	Bibliography.....	277

Tables

Table II.1	Keynesian efficiency and growth: an empirical exercise.....	64
Table II.2	Latin America (8 countries): real GDP, exports and imports, average annual growth rates, 1990–2021	66
Table II.3	Latin America and the Caribbean (16 countries): non-linear relationship between industrialization and emissions, 1970–2019.....	70
Table II.4	Emissions by product type, grouped according to Pavitt’s classification, 2015–2018 averages.....	71
Table II.5	Emerging and developing world (selected regions): external debt indicators, 2019–2021	75
Table II.6	World, developing economies and developed economies: manufacturing shares of total employment and periods of high international liquidity.....	80
Table II.7	Latin America and the Caribbean: intensity of industrial policy instruments in Latin America and the Caribbean, by area and scope.....	85
Table II.8	Latin America and the Caribbean: public institutions operating in different areas of industrial policy.....	87
Table II.9	Latin America (5 countries): intensity of use of industrial policy instruments, by type.....	88
Table III.1	Employment rate and structure complexity: a fixed-effects panel exercise	104
Table III.2	Argentina, Brazil and Mexico: wage dispersion across sectors, 1980–2019	105
Table III.3	Latin America: nationally determined contributions	118
Table IV.1	Latin America (10 countries): green hydrogen pilot projects under way or in development, 2022	139
Table IV.2	Regulatory frameworks for lithium exploitation and capacity-building instruments and mechanisms to add value to this resource in lithium triangle countries	142
Table IV.3	Share of electric vehicles in total sales of original equipment manufacturers, 2025–2040.....	146
Table IV.4	Share of electric vehicles in total sales of original equipment manufacturers, 2025–2030.....	149
Table IV.5	Mexico: circular economy management mechanisms for the automotive chain in the State of Querétaro.....	158
Table IV.6	Latin America and the Caribbean: breakdown and evaluation of bioeconomy exports, by category and subperiod, 2010–2020	160
Table IV.7	Estimates of market growth in different sectors of the high value added bioeconomy.....	167
Table IV.8	Latin America (selected countries), United States and European Union: stylized facts of the pharmaceutical industry, 2019.....	172
Table IV.9	Latin America and the Caribbean: trade balance in human vaccines, 2008–2020.....	174
Table IV.10	Brazil and Mexico: examples of Industry 4.0 impacts in the agricultural and automotive sectors	187
Table V.1	Latin America and the Caribbean: objectives, instruments and modelling of the scenario in which sustainable development policies are implemented in the countries and territories of the region.....	232
Table V.2	Latin America and the Caribbean (12 countries): monetary policy rates, December 2020–July 2022	238

Figures

Figure I.1	The rise and downturn in globalization: annual change in world GDP and international trade volume, 1994–2022	18
Figure I.2	Per capita GDP growth rate in the world economy, 1961–2020	19
Figure I.3	Value of global exports of goods, services and digitally supplied services, 1980–2021	22
Figure I.4	Annual variations in global goods and services export volumes and global foreign direct investment flows, 1990–2021	22
Figure I.5	China: goods exports and imports as a share of GDP, 1990–2021	25
Figure I.6	Selected groups: share of world GDP, trade in goods and population, 2021	26
Figure I.7	International migrants worldwide, 2000, 2010 and 2020	27
Figure I.8	Proportion of intraregional migrants among total migrants, by region of origin, 2000 and 2020	28
Figure I.9	COVID-19 vaccines and mortality, by country groups according to income level, first half of 2021 to first half of 2022	31
Figure I.10	COVID-19 vaccines and labour markets, by country groupings according to income level, first quarter of 2020–second quarter of 2022	32
Figure I.11	Year-on-year consumer price inflation rates, January 2017–May 2022	33
Figure I.12	Non-resident portfolio capital flows to emerging markets, January 2019–May 2022	35
Figure I.13	Per capita GDP and per capita greenhouse gas emissions in the world, by income level, 2019	37
Figure I.14	Internet users, connected Internet of things devices and amount of data created and consumed globally, 2010–2021	40
Figure I.15	World: goods and services trade flows, foreign direct investment and international broadband, 1990–2021	41
Figure I.16	Value of the global digital technology industry compared with traditional industries, by industry sector, 2010, 2019, 2020 and 2021	41
Figure I.17	Number of operating Internet of things platforms and distribution by industry segment, 2021	43
Figure II.1	Revealed comparative advantage index (RCAI) and per capita exports, simple averages, 2010–2019	55
Figure II.2	Selected regions and countries: average export diversification, 2010–2019	56
Figure II.3	Selected regions and countries: export baskets by sector, according to the revised Pavitt typology, simple averages by country, 2010–2019	58
Figure II.4	Latin America and the Caribbean: export baskets by sector, according to the revised Pavitt typology, by subregion, simple averages by country, 2010–2019	58
Figure II.5	Latin America and the Caribbean and selected Asian economies: the flight to high technology and export shares of science-based and specialized supplier industries, simple averages by country, by decade, 1960–2010	59
Figure II.6	Selected regions and countries: exports of modern services, 2010–2019	60
Figure II.7	Income elasticity of export demand, medians of estimates at the two-digit level of the Standard International Trade Classification (SITC), 1960–2019	61
Figure II.8	Latin America and the Caribbean and groups of advanced and emerging economies: technological dynamism and demand dynamism go together and reinforce each other	63
Figure II.9	Selected regions: income elasticity of exports	65
Figure II.10	World and Latin America and the Caribbean: reductions in per capita GDP due to temperature increases in a high emissions scenario, 2030 and 2050	67
Figure II.11	Latin America and the Caribbean: shares of total emissions, by activity, 2019	69
Figure II.12	Economic complexity index and greenhouse gas (GHG) emissions intensity, 2015–2018 average	70
Figure II.13	The Caribbean (selected countries and territories): natural disasters, 2000–2021	72
Figure II.14	The Caribbean: share of total installed renewable energy capacity, by technology	73
Figure II.15	Latin America and the Caribbean: trend rates of change in labour productivity and gross fixed capital formation, 1991–2020	74
Figure II.16	Latin America and the Caribbean: public and private investment as shares of the total, 1970–2019	75

Figure II.17	Selected groupings and regions: general government gross fixed capital formation, 2019	76
Figure II.18	Latin America (18 countries): cumulative inward foreign direct investment flows, equity and intercompany lending.....	78
Figure II.19	Latin America and the Caribbean and Asia (36 countries and territories): gaps in the manufacturing share of GDP, 1980–2017	79
Figure II.20	Latin America and the Caribbean and Asia (36 countries and territories): gaps in the manufacturing share of total employment, 1980–2017	79
Figure II.21	Latin America: gross domestic product, 2019 to first quarter of 2022	91
Figure II.22	Latin America (19 countries): balance-of-payments current account, by components, 2009–2022	92
Figure II.23	Latin America and the Caribbean: 12-month rates of change in the consumer price index (CPI), January 2005 to June 2022	93
Figure III.1	Variations in productivity and employment, by region, 2005–2019.....	103
Figure III.2	Latin America and the Caribbean (24 countries): participation rate and unemployment rate, by sex, weighted average, 2001–2022	105
Figure III.3	Latin America (8 countries): productivity gap and wage gap between formal and informal sector workers, 2000–2018.....	106
Figure III.4	Latin America (10 countries): variation in number of workers (formal and informal), simple average, compared to 2019.....	107
Figure III.5	Latin America (12 countries): employed population aged 15 and over in low-productivity sectors (informality), weighted average, around 2010, 2014, 2019 and 2020.....	108
Figure III.6	Latin America (12 countries): employed population aged 15 and over in low-productivity sectors, by sex, age group and geographic area of residence, weighted average, 2020	109
Figure III.7	Latin America: population distribution by income stratum, 2019–2021	111
Figure III.8	Peru: employment rate of the immigrant population by formality status, 2014–2019.....	114
Figure III.9	Costa Rica: informal employment by migration status, 2010–2020	114
Figure III.10	Chile: composition of GDP growth, by growth factor and migratory origin of the labour force, 2009–2017	115
Figure III.11	Climate change: a fundamental asymmetry.....	116
Figure III.12	Latin America: per capita greenhouse gas emissions, by income decile	118
Figure III.13	World: human development index and total per capita energy consumption, 2019	119
Figure III.14	Latin America: poverty resulting from the chronic impact of climate change on per capita GDP, 2030	120
Figure III.15	Latin America (17 countries): central government social spending, 2000–2020.....	121
Figure III.16	The English-speaking Caribbean (5 countries): central government social spending, 2008–2020	122
Figure III.17	Latin America and the Caribbean (30 countries): estimated average per capita expenditure on emergency cash and in-kind transfers, January–December 2021	124
Figure IV.1	Latin America and the Caribbean: energy efficiency by sector, 1991–2020	134
Figure IV.2	Comparison of levelized costs of competitive renewable energy and of fossil fuels, 2021.....	135
Figure IV.3	Latin America and the Caribbean (17 countries): green hydrogen industry development index, 2022.....	139
Figure IV.4	Estimated and projected end uses for lithium in the world, 2006–2030.....	141
Figure IV.5	Participation of countries in the lithium-ion battery value chain, 2020.....	142
Figure IV.6	Global sales and market share of light electric vehicles, 2016–2021	145
Figure IV.7	Electric bus sales and share of total fleet, by selected countries and regions, 2015–2021	147
Figure IV.8	Electric buses in circulation, by manufacturer, July 2022.....	149
Figure IV.9	Latin America: electric buses in circulation, by model and country, April 2022.....	150
Figure IV.10	Latin America: electric buses in circulation, by manufacturer, April 2022	150
Figure IV.11	Latin America (4 countries): effects of achieving circular economy targets, 2030.....	154
Figure IV.12	Intensity of fertilizer use and variation in the world and its regions, 2000–2004 compared to 2015–2019.....	162

Figure IV.13	Latin America and the Caribbean (28 countries): intensity of fertilizer use and agricultural gross output value, 2000–2004 and 2015–2019	163
Figure IV.14	Latin America and the Caribbean: fertilizer imports by country of origin and composition, 2010–2020	164
Figure IV.15	Latin America and the Caribbean: pharmaceutical patents granted, 1990–2020	173
Figure IV.16	Latin America and the Caribbean: trade balance in pharmaceutical products, 2008–2020	174
Figure IV.17	Latin America and the Caribbean: distribution of pharmaceutical exports, by main destinations, 2010–2012 and 2018–2020	175
Figure IV.18	Connectivity in selected regions of the world, around 2021	181
Figure IV.19	Latin America and the Caribbean (18 countries): Internet penetration in households and in the total population, 2020	181
Figure IV.20	The Caribbean (17 countries and territories): Internet users as a percentage of the population, 2012, 2017 and 2020	182
Figure IV.21	Latin America and the Caribbean (18 countries): connection quality in terms of fixed and mobile broadband latency and download speed, monthly average, May 2022	183
Figure IV.22	Latin America (9 countries): children between the ages of 5 and 12 living in households with no Internet connection, by income quintile, 2020	184
Figure IV.23	Latin America (7 countries): effective affordability of a digital basket in households in the poorest income quintile	184
Figure IV.24	Latin America and the Caribbean: value of the digital industry compared with traditional industries, by industrial segment, 2010, 2019, 2020 and 2021	185
Figure IV.25	Latin America (7 countries): variation in women’s employment in paid domestic work, around the second quarter of 2020 with respect to the same quarter of 2019	195
Figure IV.26	Latin America (8 countries): trend of employment levels in the construction and paid domestic work sectors, first quarter of 2020–first quarter of 2021	196
Figure IV.27	Latin America (10 countries): value of household unpaid work relative to gross domestic product, around 2015	199
Figure IV.28	South America, the Caribbean, Central America, Mexico and the world: year-on-year variation in international tourist arrivals, 2020, 2021 and 2022 relative to 2019 levels	200
Figure IV.29	Latin America and the Caribbean: total service exports and tourism service exports, 2010–2021	201
Figure IV.30	Latin America and the Caribbean (24 countries): share of tourism service exports in GDP and in total service exports, 2019	202
Figure IV.31	Central America and Mexico: share of tourism in exports, GDP and employment, 2019	203
Figure IV.32	Central America and Mexico: women’s income relative to that of men, 2019	204
Figure IV.33	The Caribbean (15 countries): impact of coronavirus disease (COVID-19) and contribution of tourism to GDP, 2019 and 2020	206
Figure IV.34	The Caribbean: average monthly stopover tourism, January 2020–April 2022, compared to 2019 levels	207
Figure IV.35	Latin America and European Union: labour productivity relative to large firms, by firm size, 2008, 2016 and 2018	210
Figure IV.36	Latin America and the Caribbean: employment, by firm size and formality, 2020	211
Figure IV.37	Latin America and the Caribbean: distribution of employment, by firm size and formality status, 2020	211
Figure IV.38	Latin America and the Caribbean: distribution of employment by firm size, 2020	212
Figure IV.39	Latin America and the Caribbean: average schooling of persons employed in formal and informal sectors, by firm size, 2020	212
Figure IV.40	Latin America and the Caribbean: average monthly labour income of persons employed in the formal and informal sectors, by firm size, 2020	213
Figure IV.41	Latin America and the Caribbean: microenterprise share of employment, by type of region, 2020 or latest available year	215
Figure IV.42	Latin America: presence of cooperatives, 1989–2020	216
Figure IV.43	Latin America (8 countries): population affiliated to cooperatives, 2020 or latest available year	216

Figure V.1	Latin America and the Caribbean: macroeconomic, social and environmental effects of the implementation of sustainable development policies in the countries of the region, change from baseline scenario, 2021–2030	233
Figure V.2	Latin America and the Caribbean (20 countries): long-term planning	237
Figure V.3	Latin America and the Caribbean (21 countries): foreign-exchange interventions by type of instrument used, 2000–2021	241
Figure V.4	Latin America and the Caribbean and countries of the Organisation for Economic Co-operation and Development (OECD): general government tax structure, 2020	245

Boxes

Box I.1	The effects of the humanitarian crisis in Ukraine	27
Box III.A1.1	Employment, productivity and structural heterogeneity: transforming production	129
Box IV.1	Investments in electric buses in Brazil	151
Box IV.2	A circular economy approach to wastewater treatment is feasible and cost-effective in the region	155
Box IV.3	The Querétaro Circular Economy System	156
Box IV.4	Lines of action of the plan for self-sufficiency in health matters in Latin America and the Caribbean	176
Box IV.5	Pillars for action to promote sustainable tourism	209
Box V.1	Learning through digital education during the pandemic: the case of the Ceibal Plan in Uruguay	253
Box V.2	Colombia: temporary protection statute for Venezuelan migrants	255
Box V.3	A territorial and gender approach to care systems: the case of the district care system of Bogotá	259
Box V.4	Thematic sovereign bonds: the case of Chile	263
Box V.5	Regulatory harmonization in the Pacific Alliance	274

Diagrams

Diagram I.1	Dimensions of social unrest	29
Diagram I.2	Dimensions of digital development and their disruptive effects on society, the production sector and the State	39
Diagram II.1	Interaction between the different types of efficiency	62
Diagram IV.1	General sequence of green hydrogen value chain	137
Diagram IV.2	Analysis framework for the circular economy in production chains	153
Diagram IV.3	Mexico: flows in the automotive chain	157
Diagram IV.4	The care economy	193
Diagram IV.5	The COVID-19 crisis aggravated the challenges of gender inequality and threatens women's autonomy	194
Diagram IV.6	The virtuous circle of investing in the care economy	198

Maps

Map I.1	The world by market capitalization value of companies in the digital economy, 2021	44
Map IV.1	Latin America and the Caribbean (9 countries): relative share of current GDP generated by each intermediate territorial entity relative to the region's total GDP, 2020	214



Foreword

In a highly complex macroeconomic, social and environmental context in the region that demands a rethinking of short- and long-term public policies, the Economic Commission for Latin America and the Caribbean (ECLAC) is fulfilling its mandate at its thirty-ninth session, by presenting the countries of the region with a proposal for economic reactivation and transformation of development models in Latin America and the Caribbean.

The worst economic and social crisis that the region has ever experienced, amid the coronavirus (COVID-19) pandemic, is now being followed by times of great difficulty and uncertainty generated by a series of cascading—climate, health, employment, social, educational, food security, energy and cost-of-living—crises.

The region faces major short-run economic and social policy challenges, given the need to reconcile policies to simultaneously foster economic recovery, address inflation and the cost-of-living crisis, maintain support for the most vulnerable households, and strengthen the sustainability of public finances. Yet, difficult as the current global juncture is, the greatest challenges are posed by long-term structural factors: the need to increase productivity, transform economic and productive systems to create more and better jobs, move toward more technologically sophisticated low-carbon economies to address climate change, reduce structural gaps and heterogeneities, turn education systems into true drivers of social mobility and growth, end gender gaps and advance towards universal social protection systems in the framework of solid welfare states, to mention only a few of the most pressing.

Moreover, an inflationary process in the global economy such as has not been experienced in 20 years is weighing heavily on monetary policy both in developed economies and in Latin America and the Caribbean. The fiscal and monetary stimulus policies adopted during the pandemic have given way to more restrictive policies, reflected in rising monetary policy interest rates almost across the board in the region. At the same time, most of the countries have seen their fiscal situation deteriorate as a result of the major fiscal efforts made to combat the worst moments of the COVID-19 crisis and its social fallout. The social situation in the region has also deteriorated, with considerable increases in poverty levels reflecting the effects of the pandemic and the ensuing economic contraction. Moreover, income inequalities increased significantly after the outbreak of the pandemic, leading to a deterioration of living conditions and economic prospects not only for the poorest segments, but also for the middle-income sectors, with significant political and social implications. This has been compounded by large migratory flows, which need to be addressed.

It is essential to ensure that public spending is sustainable and to avoid making adjustments that would deepen the economic slowdown and compromise support for the most vulnerable sectors. This means expanding the fiscal space and building a macroeconomic governance that will make cyclical downturns shorter and shallower and render expansionary cycles more sustainable over time.

In addition to facing the difficult challenges posed by the current conditions, the region's economies must also tackle the challenge of reversing the low productivity and investment growth of the past three decades, which have become structural constraints to development. Productive policies need to be rethought to allow the region to become rapidly integrated into the technological revolutions that have changed the production paradigm. Productive policies for recovery must have a sectoral dimension in addition to the appropriate macroeconomic and financial framework. Although sectoral specifics will have to be defined in each national context, ECLAC proposes affording special attention to at least nine sectors that have strong potential to galvanize and transform the productive structure: the energy transition, e-mobility, the circular economy, the bioeconomy, the health-care manufacturing industry, digital transformation, the care economy, sustainable tourism, the micro- small, and medium-sized enterprise (MSME) sector, and the social and solidarity economy.

Technological revolutions generate waves of creative destruction with transformative socioeconomic effects. The policy challenge is ensuring that creative and innovation-driving dynamics prevail over destructive dynamics, and that the social and labour sectors affected benefit from social protection systems and active labour market policies (labour market integration and training), in order to take advantage of the opportunities of the new world of work that the technological revolution is creating.

The reactivation and transformation of the productive apparatus must also be environmentally sustainable if it is to be successful in reducing the effects of climate change — which affect the less developed countries most severely. These countries, which produce the least greenhouse gas emissions and are the least prepared to cope with the adverse effects of climate change, suffer its strongest effects.

The transformation of the productive structure needed in Latin America and the Caribbean will be the outcome of policy choices —as has historically been the case for all countries that have escaped the middle-income trap and become high-income countries— and not the sole result of factor endowments. The institutional and political economy dimensions, in co-evolution with the productive structure, define the development model. Countries that have adopted productive transformation and diversification policies and maintained them over time have achieved better long-term growth outcomes than those that have not. The region's low and falling investment and productivity levels over the past three decades are the result of its countries' limited capacity to make and sustain the required changes in the production structure, and thus in the quantity and quality of employment.

States in Latin America and the Caribbean need to develop a much stronger institutional capacity to design, implement and evaluate the public policies necessary for sustainable structural change. Public policies must have disruptive effects on the composition of the region's productive structure, so they need to be carried out by ministries and secretariats with the political influence and institutional capabilities to do so. If they are to be implemented effectively, productive, industrial and technological policy initiatives require institutional and political support and must be backed by adequate capacity.

Countries also find themselves lacking solid welfare states and systems. The transition towards universal access to certain goods and services (such as health and education) that are crucial to well-being and productivity growth is a challenge that the region's public policies have yet to fully incorporate. Combating poverty and inequality requires more formal employment and social policies leading towards universal social protection systems. Both dimensions must recognize and attack other sources of inequality, such as those relating to gender, race or age and those stemming from environmental deterioration. Universal social protection is not only a moral imperative for development; it also contributes both to social justice and to economic growth and resilience: this is why the region must set about developing welfare states.

If the region is to overcome the problems that are holding it back and locking it into a path of slow investment, low growth and great inequality, it must implement a wide range of macroeconomic, productive, social and environmental policies with a strong sectoral slant. A series of important points emerge from the strategies and policies proposed by ECLAC at its thirty-ninth session: the urgency of reactivating investment and growth; recognition that the role of the State is crucial and irreplaceable in all its dimensions, from articulating proposals and providing financing on a scale not readily accessible to the private sector, to defining regulatory models and formulating and implementing policy; and the need to join up sectoral and economy-wide policies and to create spaces for stakeholders to negotiate, make decisions and take action while acknowledging their different capacities, advantages and limits.

The proposed agenda is ambitious, but this is not a time for gradual or timid changes, but a time for bold and transformational ones. Only by raising the level of ambition can the region respond to the multiple simultaneous challenges and shocks it faces, with due consideration for the complexity of its economies and societies. Coordinating the proposed strategies and policies and ensuring their effective implementation and adjustment to new realities over time will require new forms of experimentalist governance, based on iterative and participatory processes of policy formulation and implementation. In some cases, new fiscal, productive, social and environmental compacts will be needed to resolve the problems of the current juncture and underpin long-term progress towards sustainable, cohesive and resilient societies. These are the hallmarks of the welfare states the region needs to build within the framework of more efficient and productive economies.

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Latin America and the Caribbean (ECLAC)



CHAPTER

I

The present and future of globalization: crises, environmental emergency and technological revolution

- A. Crises and changes in globalization
- B. A resurgence in inflation, across the board
- C. The environmental emergency is magnifying the effects of the economic and social crisis
- D. From the connected economy to the digitalization of the economy
- E. From an efficiency rationale to a geopolitical rationale: the future of globalization

Bibliography

A. Crises and changes in globalization

In 2022, the economic and social conditions and sustainability of the countries of Latin America and the Caribbean have been shaped not only by internal circumstances but also nearly two decades of external shocks and changes in globalization which, while varying in nature and intensity across countries, have worsened investment and production conditions in the region in a context of growing uncertainty. These shocks include the global financial crisis of 2008–2009, economic tensions between the United States and Europe with China beginning in 2017, the crisis of the coronavirus disease (COVID-19) pandemic since 2020 and the war between the Russian Federation and Ukraine since February 2022. All this, in the context of technological, environmental and demographic changes and slowing foreign direct investment and global trade, despite strong growth in trade in services, particularly technology-enabled ones.

The war in Ukraine has created new uncertainty for the world economy, affecting its level of activity. Current projections are for growth of 3.0% in 2022, 1.4 percentage points lower than projected prior to the conflict. In the United States, as of mid-2022, it was projected that annual economic growth would be 0.2%, 3.8 percentage points lower than projected before the war. In China, continued growth seems less certain than ever owing to the recent trends in the export and real estate sectors. Measures adopted under the country's "zero-COVID" plan have also affected the pace of growth. Excluding the countries directly involved in the war, the largest cut to growth projections is for the eurozone, whose economy is highly dependent on Russian energy sources: it is now expected to grow by 3.1%, 1.1 percentage points less than forecast before the war. The largest forecasted GDP declines are those of the countries in the conflict. In the case of the Russian Federation, economic activity is expected to contract by 7.0%.¹

Increases in energy, food and, more generally, commodity prices, the steep rise in international transportation costs, worsening supply problems and growing domestic demand in developed economies, discussed below, have pushed up global inflation, which has been rising since the second half of 2020 and reached four-decade highs in the first four months of 2022. As a result, inflation has once again become the focus of international discussion and policy agendas amidst a heightened risk of stagflation.

The war in Ukraine has had detrimental effects on global food supply. The destruction of infrastructure and the blockade of Black Sea ports is preventing or hindering shipment of food stores in both warring nations. Exports from Ukraine have virtually halted since the war began, owing in particular to the closure of ports (the site of approximately 90% of agricultural exports),² damage to critical infrastructure and the displacement of persons.³ Between 1 August and 15 September 2022, 144 ships carrying some 3.25 million tonnes of grain left Ukrainian ports for different destinations under the Black Sea Grain Initiative (Aydoğan Ađıııarcı, 2022). This is less than 15% of the stocks estimated to have been blocked in Ukraine since the beginning of the war.

The return of Ukrainian grain to the international market has increased the security of supply and, combined with the harvest period in the northern hemisphere, pushed the FAO cereal price index down by 28.3 points (16.3%) between July and August, from its peak in May. However, the agreement is valid for 120 days and will have to be extended in mid-November, provided that the Russian Federation and Ukraine agree. Failure to extend the agreement and the loss of this export outlet for grain blocked in Ukraine would severely disrupt global food markets.

A combination of shocks and trends varying in nature and duration has triggered changes in globalization, some of which have been mutually reinforcing, weakening globalization as a driver of growth and leading to the prioritization of geopolitical considerations over efficiency (see figure I.1). All this is taking place in a context in which the parameters of sustainable development continue to be altered by two megatrends: the environmental emergency and the technology revolution. This chapter analyses these processes on a global scale.

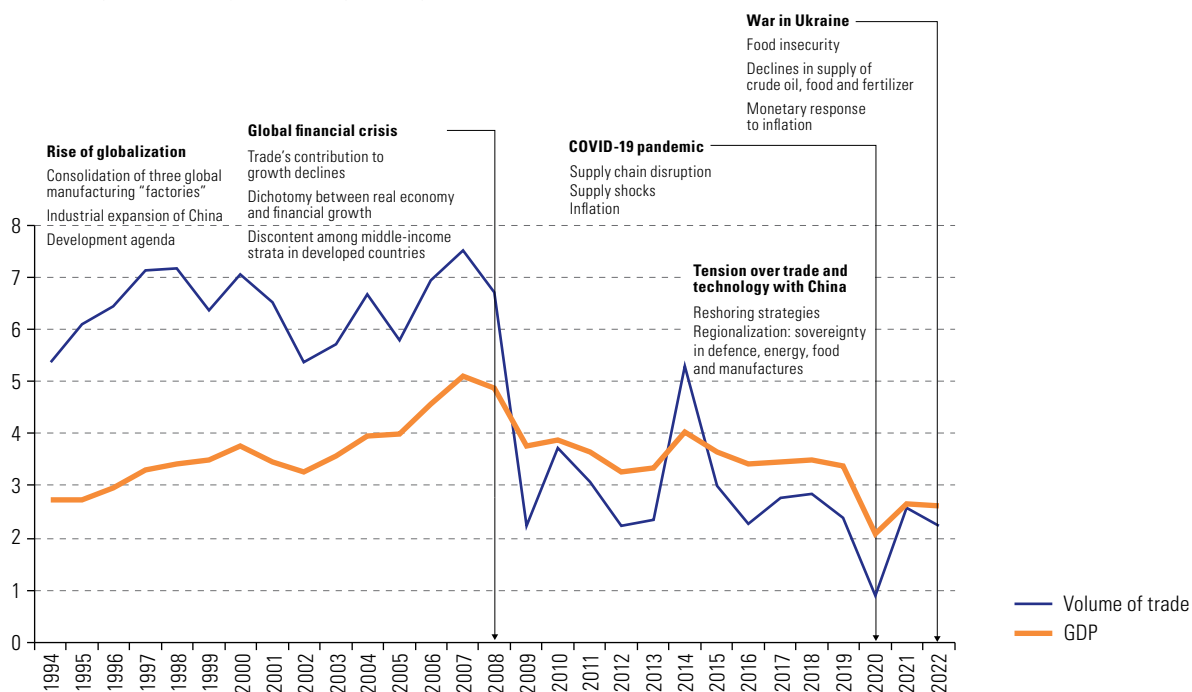
¹ Data for the world are from OECD (2022b) and Capital Economics (2022); for the United States from Board of Governors of the Federal Reserve System (2022b); for the eurozone, European Central Bank (ECB, 2022b); and for the Russian Federation, Capital Economics (2022).

² In early August 2022, some grain exports resumed from some ports in Ukraine after the signing of the Initiative on the Safe Transportation of Grain and Foodstuffs from Ukrainian Ports (Black Sea Grain Initiative), an agreement under the auspices of the United Nations. See [online] <https://news.un.org/en/story/2022/07/1123062>.

³ As of mid-2022, nearly half of the grain exports of Ukraine, or 22 million tons, was stored in siloes with no way to export it. This volume is equal to the combined annual consumption of all least developed economies in the world (ECLAC and FAO, 2022).

Figure I.1

The rise and downturn in globalization: annual change in world GDP and international trade volume, 1994–2022^a
(Percentages and five-year moving averages)



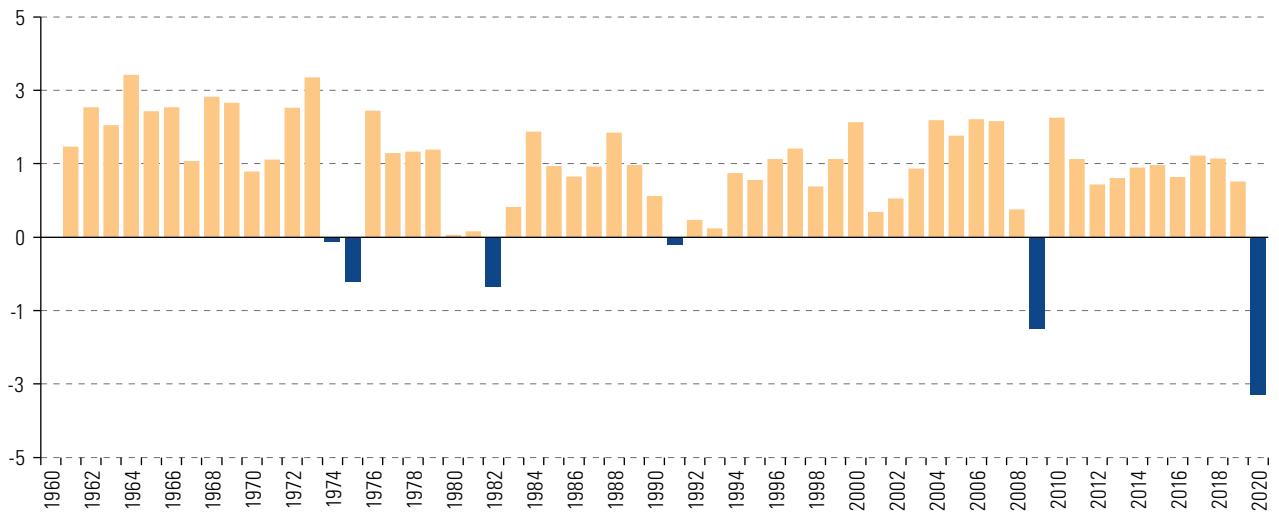
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the World Trade Organization (WTO) and the International Monetary Fund (IMF).

^a The figures for 2022 are projections.

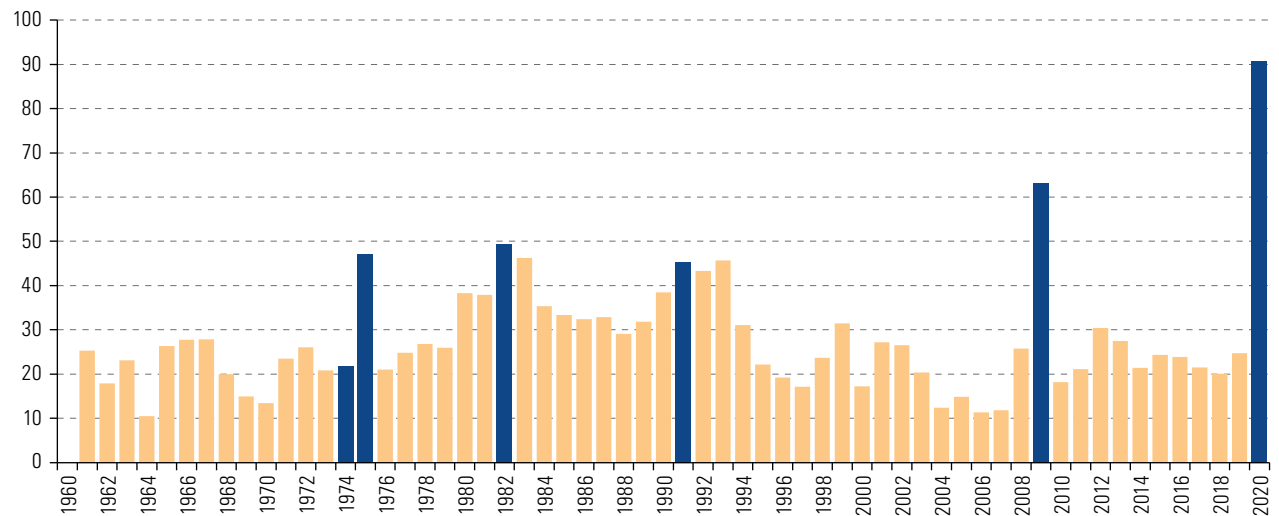
These crises have changed in both form and nature: since 2008, they have become more frequent, more severe and more global. World GDP per capita has declined six times since 1961: in 1974, 1975, 1982, 1991, 2009 and 2020. The steepest falls were seen in the last two of those years, with 2.5% and 4.3%, respectively (see figure I.2). In a globalized world, the synchrony of upward and downward cycles has increased, albeit with varying intensity, reflecting this greater interdependence. In 2009, during the global financial crisis, 129 of 195 countries (63%) reported contractions in GDP per capita, a figure that rose to 177 (91%) in 2020 amid a crisis very different in origin: the pandemic. In fact, 2009 and 2020 are the only two years for which figures are available in which more than half of the world's countries experienced recessions. International trade as a percentage of world GDP has not returned to its 2008 high. As regards production, well before the pandemic, and in particular after the tsunami in South-East Asia in 2004, there had been doubts as to the resilience of a globalization model based on value chains with limited stock and just-in-time production and delivery. Thus, globalization has struggled to function as an engine of growth.

Figure I.2
Per capita GDP growth rate in the world economy, 1961–2020
(Percentages)

A. World per capita GDP growth rate



B. Proportion of countries with negative per capita GDP growth



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, "GDP per capita growth (annual%)" [online] <https://data.worldbank.org/indicator/NY.GDP.PCAP.KD.ZG>.

1. The global financial crisis of 2008–2009: a turning point

In terms of impact and duration, with the exception of the COVID-19 crisis, the global financial crisis (2008–2009) and the eurozone crisis (2009–2013) were the most severe since the Great Depression. Both were the culmination of a trend towards an increasing number of global and systemic financial crises that had begun in the 1970s.

Although the global financial crisis and the eurozone crisis were distinct in origin and in their transmission and propagation mechanisms, they shared one central element. Both sprang from an economic model that, since the 1990s, had been based on using private sector debt to drive aggregate demand, compensating for

declining wages in a context of low interest rates, but more importantly, of financial liberalization and deregulation. Owing in part to the downward pressure on labour costs exerted by China, this model enabled the achievement of both sustained global growth and nominal and real stability, in what was dubbed “the great moderation”.

The great moderation was not confined to the more developed countries; rather, it extended to the developing world, albeit with some lag. From the 1990s onward, the developing world also experienced less real volatility and less volatile inflation. The great moderation benefited middle-income countries in particular: between 2003 and 2007, countries in Latin America, East Asia and Eastern Europe grew at annual rates of 5.5%, 5.7% and 6.6%, respectively, driven by high rates of export growth that coincided with periods of sharp downturn in the rate of public indebtedness (Foxley, 2009). In addition, there was a steady rise in globalization over that period, measured as the value of global trade (according to goods and services exports) as a share of GDP, which went from 12.9% in 1970 to 31.2% in 2008. The great moderation was interpreted as the result of better macroeconomic management and the increased capacity of monetary and tax authorities to manage the economic cycle.⁴

In the United States, the exhaustion of the economic model that had sustained the great moderation was reflected in a real estate bubble, with a significant increase in mortgage defaults after 2006. The financial difficulties in the real estate market affected the large global banks, the result of a business model based on asset growth through leverage (the proportion of assets financed with debt) and interconnectedness (measured by the value of assets and liabilities held by other financial institutions). The relationship between leverage and interconnectedness enabled high profits and was accompanied by a process of financial concentration.

The global financial crisis erupted in September 2008, when the Lehman Brothers investment bank declared bankruptcy, thrusting the global financial system into a period of high uncertainty and volatility. The initial impact of the financial market collapse was large-scale destruction of the world’s financial wealth: some US\$ 50 trillion of value was erased in 2008 (AsD, 2009). The crisis quickly led to flight to value around the world. Cross-border capital inflows⁵ fell from 21% of world GDP in 2007 to 3% in 2008 (McKinsey Global Institute, 2009). There was a direct knock-on effect on the real economy. In 2009, world GDP per capita fell by 2.5%; in 2008, the global unemployment rate rose from 5.4% to 6.0% and gross fixed capital formation fell by 9.7%.

The economic policy response to the global financial crisis and the eurozone crisis failed to address the underlying problem of both. Economic policy focused on regulating and rescuing the financial system, in particular systemically important financial institutions. Regulatory initiatives included strengthening capital and shoring up liquidity through the Basel III accords, the identification and monitoring of systemically important financial institutions by the Financial Stability Board (established in 2011), and, in the United States, the Dodd-Frank Wall Street Reform and Consumer Protection Act (2010).

Regulatory efforts were also ineffective in addressing the dynamic and changing nature of the global financial system. Although regulation helped reduce global banking’s dependence on leverage, financial concentration remained high. In the part of the post-crisis period that fell between 2000 and 2018, the number of mergers and acquisitions increased significantly, far exceeding the number of such transactions recorded prior to the crisis. Regulation also failed to cover the entire financial system, as it ignored its most important transformation after the global financial crisis: the shift from financial activity intermediated by banks to activity based in the non-bank sector, in particular the asset management industry, whose business and ownership became strongly connected to global banking.

The COVID-19 crisis has further accentuated the importance of the asset management industry. In the United States, this industry became the fiduciary agent of the Federal Reserve in the purchase of private securities in 2020 and 2021, with significant conflicts of interest. A substantial share of the sovereign debt of developing countries is concentrated in the asset management industry, and it has an important stake in the real and financial sectors of several developed economies. Owing to the value of their assets, which exceeds the value of those of any international bank, some of these institutions have once again become the subject of discussion regarding the problem of systemic risk and financial institutions that are “too big to fail”.

⁴ That sense of optimism was exemplified in the lecture given by Lucas (2003) to the American Economic Association, in which he categorically stated that macroeconomic theory had solved its central problem: the prevention of depressions and crises.

⁵ Capital inflows represent net purchases by foreigners of FDI, equity, and debt securities, as well as deposits and loans to local banks.

The financial system bail-out was largely achieved through a policy known as quantitative easing. In the United States, this was done through the purchase of the country's treasury bonds, but more importantly, through the purchase by the Federal Reserve of debt securities and other mortgage-backed securities from the big global banks.⁶ Quantitative easing helped to improve performance on global capital markets, including the global market for bonds, and increased their importance as a source of financing. Deleveraging and lower profitability for global banks after the global financial crisis (2008–2009) decreased the number of cross-border bank loans around the world and strengthened the role of capital markets in global finance. This gave a greater role to the non-bank financial sector and the asset management industry in global finance.

The expansion of global capital markets has coincided with significant debt growth for developing economies. All regions of the developing world, without exception, have seen indebtedness grow since the global financial crisis, a process that has intensified since the pandemic began, increasing the reliance of developing economies on short-term capital flows.

Mounting debt has affected not only governments but also the non-financial corporate sector, which became a major source of vulnerability because it often operates under conditions of currency mismatch. In several developing economies, the gap between liabilities and assets denominated in foreign currency has been trending upward since 2007.

Since the onset of the pandemic, large, global banks have once again begun relying on quantitative easing.⁷ Although its purpose has always been to finance expansionary fiscal policy, it has also served to support equity markets.⁸ Furthermore, quantitative easing has been highly beneficial for the banking system inasmuch as it has increased liquidity and profitability. Nevertheless, this liquidity has not always flowed through to the real sector; rather, it has translated into larger holdings of financial securities.

2. Tensions between the three “global factories”

Since the 1990s, the defining characteristic of the global economy has been the rapid globalization of trade and finance. The end of the cold war, the adoption of the Washington Consensus in much of the developing world and the rise of China in the global economy, along with technological advances such as the Internet, were key milestones in configuring a global marketplace characterized by high cross-border mobility of goods, services and capital (Bárcena and Herreros, 2021). On the production front, the main manifestation of globalization has been the proliferation of global value chains. Under this model, transnational corporations—which are generally based in advanced countries—relocate segments of their production processes to developing countries to benefit from lower labour costs, tax exemptions, access to natural resources or other advantages. Over the last three decades, this has resulted in the development of three “global factories”: East and South-East Asia, Europe and North America.⁹ The establishment of the World Trade Organization (WTO) in 1995 and China's accession to it in 2001 provided an institutional framework for this fragmentation of production.

The growth of trade in services, especially in the last 20 years, has been one of the defining characteristics of economic globalization, driven heavily by the commercial use of the Internet from the mid-1990s and the massive introduction of broadband from the 2000s onwards. These innovations have made it technically and economically feasible to trade across borders in a number of services that were previously considered non-tradable, such as business, financial, engineering, design, educational and medical services. Thus, global exports of digitally supplied services (also called modern services) have grown much faster than total services exports, which have themselves outpaced global goods exports (see figure I.3 and chapter IV, section F).

⁶ The policy of quantitative easing was used for approximately six years through three main rounds of large-scale asset purchases: December 2008–March 2010 (QE1), November 2010–June 2011 (QE2) and September 2012–December 2013 (QE3).

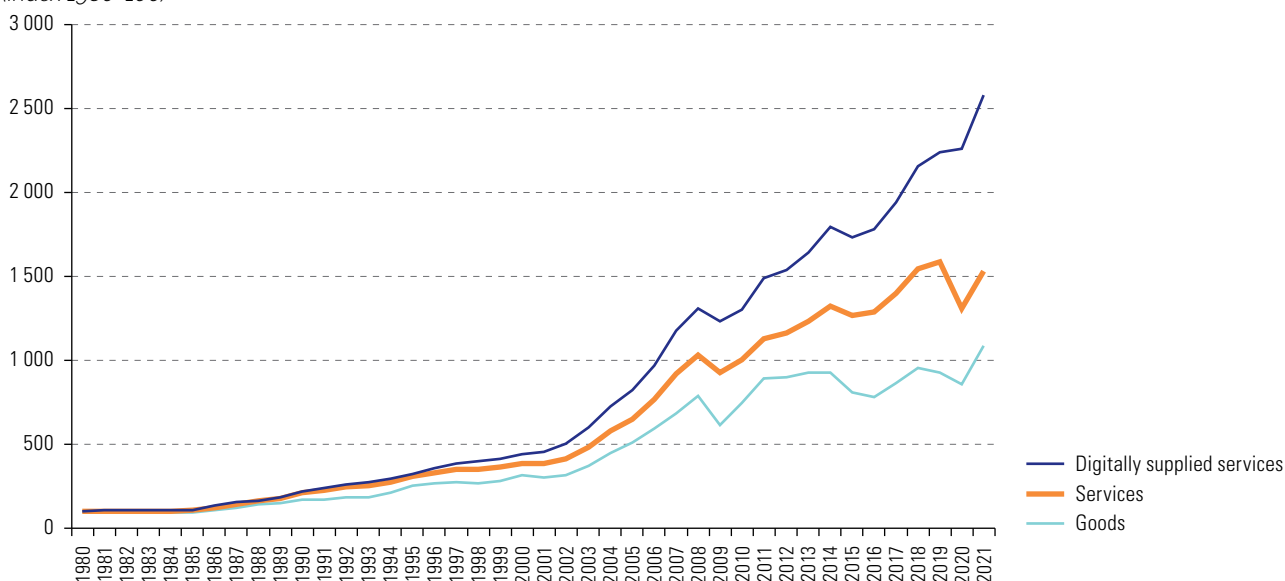
⁷ At year-end 2021, the assets of the United States Federal Reserve, the European Central Bank, the Bank of England and the Bank of Japan were valued at 33%, 60%, 43% and 129% of their respective GDPs.

⁸ In the United States, there is a positive correlation between a higher Federal Reserve balance sheet and the stock market index. Between March and December 2020, Federal Reserve assets grew from US\$ 4.2 trillion to US\$ 7.4 trillion and the S&P 500 index rose from 3,044 to 3,693. Between December 2020 and 19 November 2021, Federal Reserve assets grew from US\$ 7.4 trillion to US\$ 8.8 trillion and the S&P 500 index rose from 3,738 to 4,695.

⁹ The “factory” of North America includes the United States, Canada, Mexico and Central American economies such as Costa Rica, Honduras and the Dominican Republic.

Figure I.3

Value of global exports of goods, services and digitally supplied services, 1980–2021

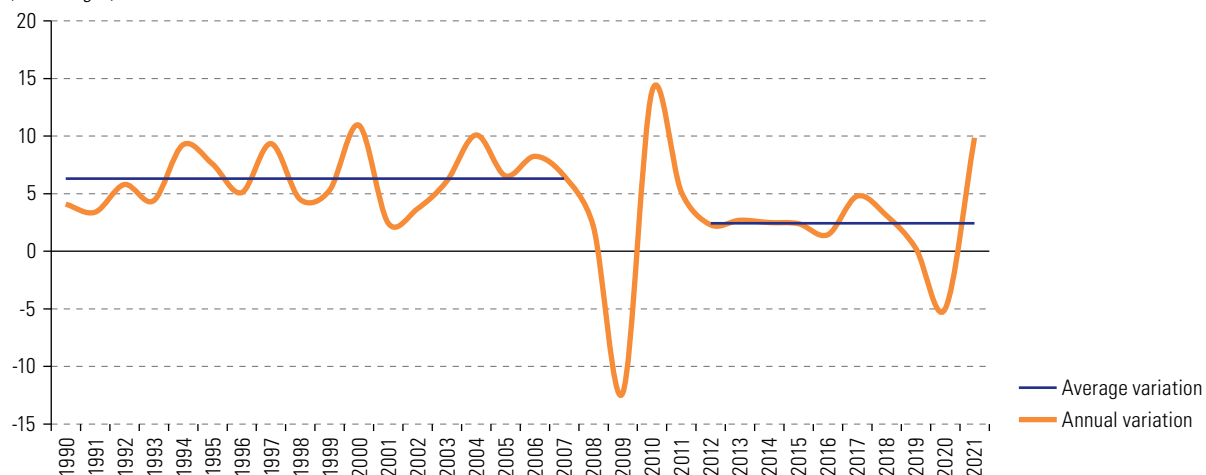
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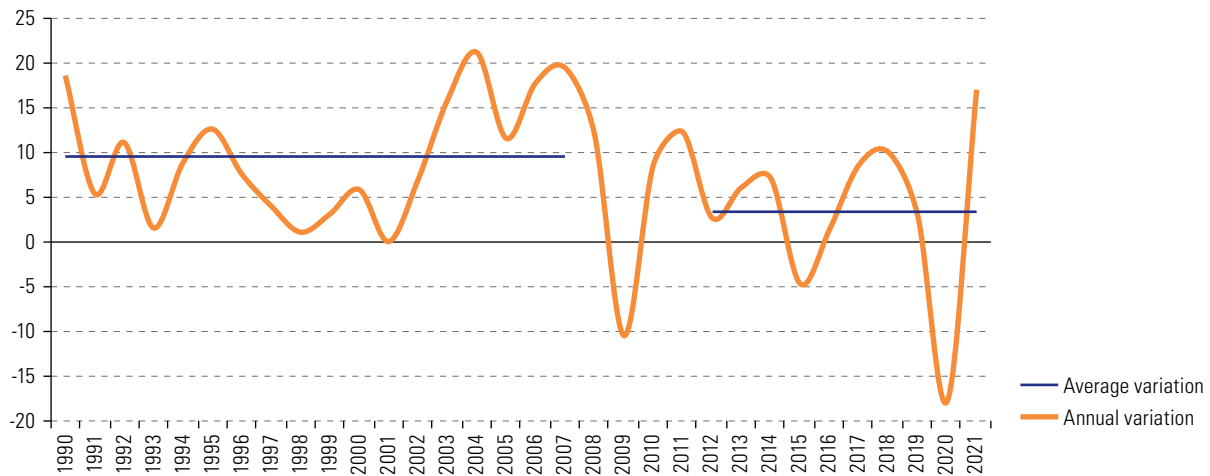
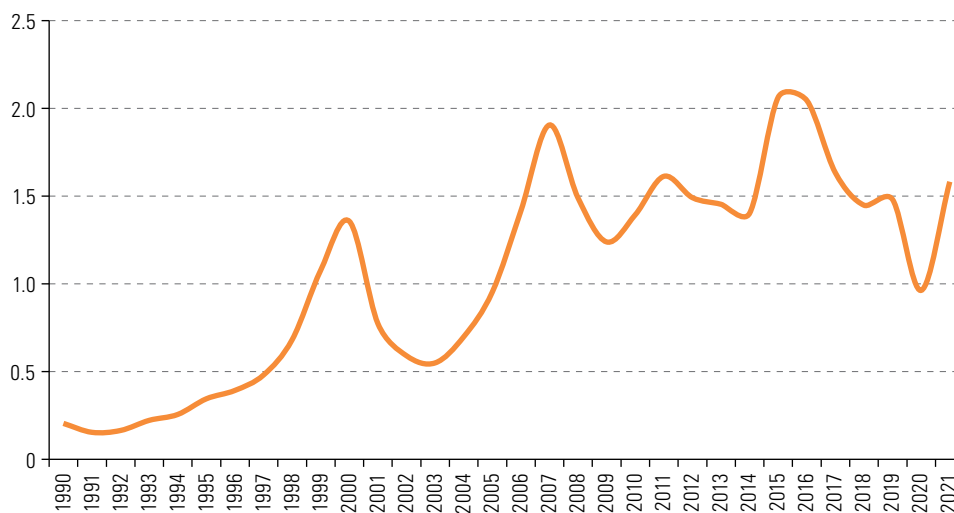
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Conference on Trade and Development (UNCTAD), UNCTADstat [online database] <https://unctadstat.unctad.org/EN/>.

Trade in goods and services and foreign direct investment (FDI) have been sluggish since the 2008–2009 financial crisis. Between 1990 and 2007, the volume of world trade in goods rose at an average annual rate of 6.3%, but between 2012 and 2021, annual average growth was just 2.4%. While the value of global trade in services grew at an average rate of 9.8% per year between 1990 and 2007, it expanded by only 3.5% per year after 2012. Meanwhile, that of annual global flows of FDI slightly surpassed their pre-crisis peak (US\$ 1.9 trillion, reached in 2007) in 2015 and 2016 alone. The pandemic exacerbated the slowdown in globalization (except that of the digital economy, which was boosted by restrictions on movement) and caused a 5% fall in the volume of world trade in goods in 2020—the largest drop since 2009. It also led to a 17.7% drop in the value of service exports, driven down by the collapse in tourism, and a 35% contraction in global FDI (see figure I.4). As COVID-19 vaccination progressed and demand increased, the three variables rebounded strongly in 2021, reflecting primarily the low basis for comparison in 2020.

Figure I.4

Annual variations in global goods and services export volumes and global foreign direct investment flows, 1990–2021

*(Percentages and billions of dollars)***A. Global goods export volumes***(Percentages)*

B. Global service export values*(Percentages)***C. Global foreign direct investment flows***(Trillions of dollars)*

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Trade Organization (WTO), WTO Stats database and United Nations Conference on Trade and Development (UNCTAD), UNCTADSTAT database.

In 2021, international investors were cautious in announcing new, or greenfield, investment projects, except in certain technology-intensive sectors. The value of global FDI project announcements grew by just 12%, reaching approximately US\$ 645 billion, lower than the annual average for the 2010s (US\$ 800 billion). The announced investments were concentrated in Europe and North America (the United States and Canada), while the value of announced investments in most emerging regions remained stable or fell. The sectors that benefitted most were renewable energy (13%), semiconductors (12%), communications (11%), real estate (8%), software and computer services (5%) and food and beverages (5%), which together accounted for 54% of total announcements in 2021. The highest growth was seen in semiconductors,¹⁰ at 386%, while renewable energy (down 7%) was the only sector of this group in which announced investment fell below 2020 levels (ECLAC, 2022f).

¹⁰ The largest investment announcement was made by Intel, a United States company, for the opening of a cutting-edge semiconductor manufacturing facility in Germany with an investment of US\$ 19.3 billion (Intel, 2022). South Korean firm Samsung announced an investment of US\$ 17 billion in a new factory in the United States that will manufacture advanced semiconductors for use in 5G mobile telephony, high-performance computing and artificial intelligence (Samsung, 2021).

The surge in announcements in the semiconductor industry was driven, in part, by market dynamics as demand rose sharply, and in part by geopolitical factors, which resulted in the sector being identified as strategic. Until 2019, investment announcements in semiconductor manufacturing had been mainly concentrated in China, the destination of 33% of FDI announced between 2005 and 2019, followed by the United States and Japan, with 11% and 8%, respectively. That situation changed dramatically in 2020 and 2021. In 2021, the three countries concentrating the largest value of announced investments in the semiconductor industry were Germany (24%), the United States (23%) and Japan (18%); China accounted for just 7% (ECLAC, 2022f).

The announcement of new facilities in the United States and European Union countries cannot be dissociated from the initiatives taken in those economies to boost the semiconductor industry and other strategic industries in an attempt to provide a counterweight to the position of China. In the United States, the CHIPS (Creating Helpful Incentives to Produce Semiconductors for America) and Science Act, to boost semiconductor research, development and production was signed into law in August 2022. It provides US\$ 52 billion in subsidies for private companies to encourage domestic production of semiconductors.

In 2021, the European Commission launched the Industrial Alliance for Processors and Semiconductor Technologies with a view to fostering collaboration in the public, private and academic sectors to identify gaps in microchip manufacturing and in the technological advances required to increase production. In a similar vein, the European Chips Act was proposed in 2022, seeking to mobilize 43 billion euros of public, local and national investment by 2030 to make the European Union more attractive to technology companies setting up production facilities (ECLAC, 2022f).

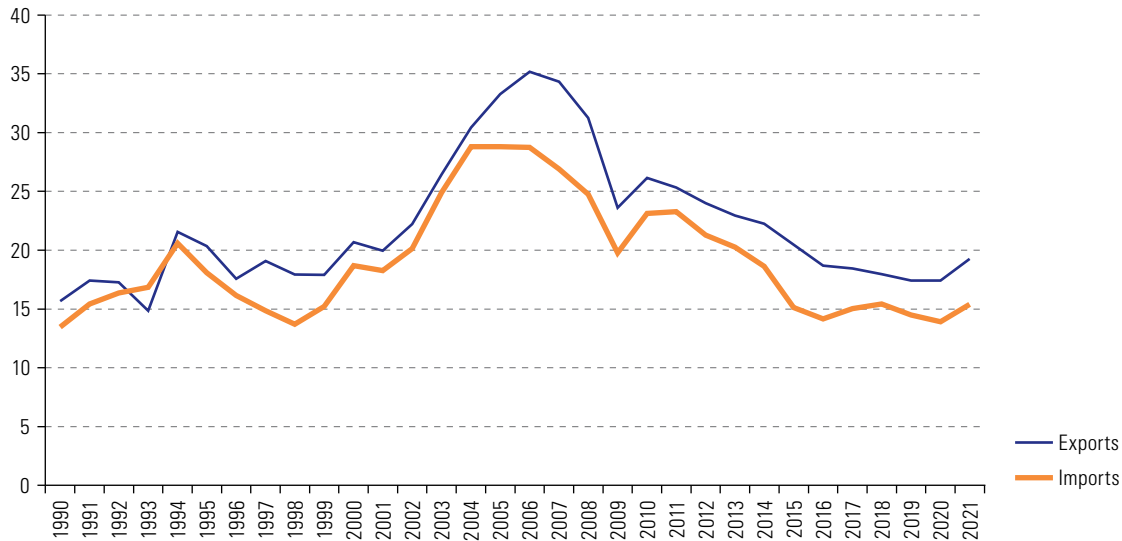
China has also taken decisive action in this area, adopting in May 2015 the “Made in China 2025” initiative. The objectives of the initiative include increasing the local content of semiconductors from 40% in 2020 to 70% in 2025. Since March 2021, technology development has been regarded as a national security issue and semiconductors as strategic technology, while research and development (R&D) spending is set to increase by 7% over the next five years. Among other measures, the government announced the China Integrated Circuit Industry Investment Fund, known as the “Big Fund” (with an initial investment of US\$ 20 billion and US\$ 30 billion in the subsequent phase) to invest in chip manufacturers.

The factors behind the slowdown in trade in goods and services and FDI in the 15 years since the financial crisis are manifold, chief among them escalating tensions in trade relations between the major powers, in particular since 2017. This is especially true of the United States and the European Union, which are engaged in intense economic and technological competition with China. In addition, the economic changes that have taken place in China—the largest exporter and second-largest importer of goods in the world—have significantly reduced its dependence on external trade (see figure I.5). An efficient import substitution process has enabled China to produce a variety of inputs and finished products that it once had to source from abroad, while the population’s increased purchasing power has meant that a greater share of production is destined for the domestic market.

Technological advances associated with the fourth industrial revolution have made it possible to automate a growing range of industrial processes—reducing the incentive to transfer production to countries with lower labour costs—and replace trade in physical goods with flows of digital products and services in an ever-increasing number of sectors. Lastly, political and social support for globalization have been eroded, in particular in developed countries, a process that has been intensified by growing inequality and the fall in manufacturing jobs as a share of total employment in most of those countries (United Nations, 2020a; Teimouri and Zietz, 2020). Although the loss of manufacturing jobs has multiple causes, some of which, such as automation and digitalization, reflect technology change, some authors in the United States point to the offshoring of industry to developing countries and the “mercantilist practices” of China as another cause (Nager, 2017; Atkinson, 2018).

Figure I.5

China: goods exports and imports as a share of GDP, 1990–2021
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Trade Organization (WTO), WTO Stats database and International Monetary Fund (IMF), World Economic Outlook Database, April 2022.

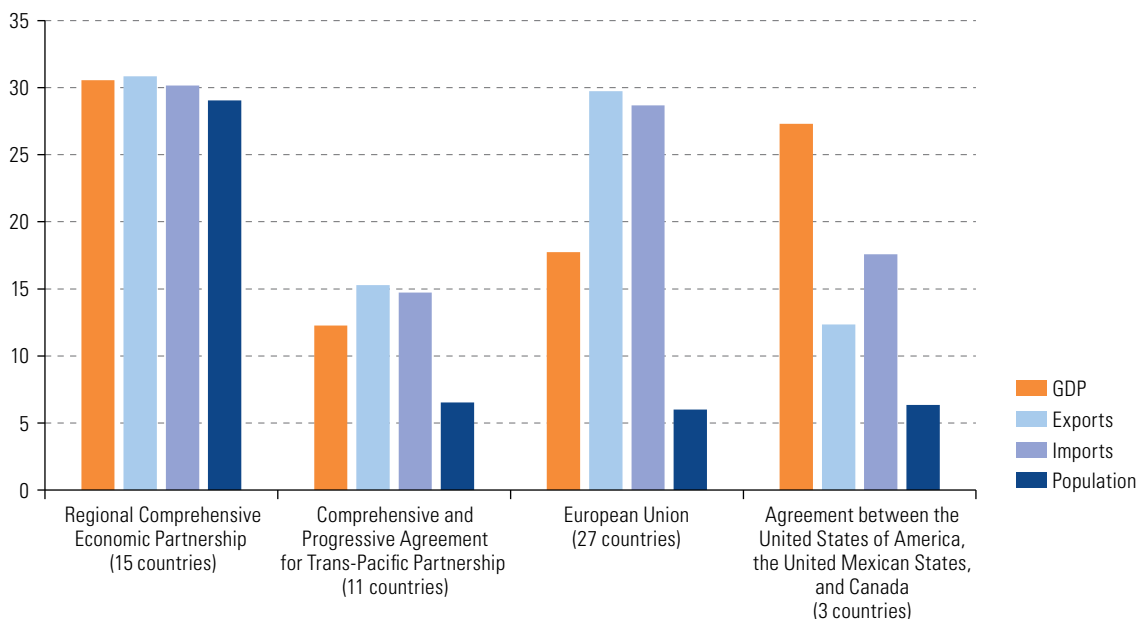
Roberts, Moraes and Ferguson (2019) argue that the global economy is undergoing a transition from the neoliberalism that has been in place since the end of the cold war towards a new geographic and economic order, characterized by greater awareness of the security risks of economic interdependence. This is illustrated by the United States restrictions on the export of certain high-tech products to China, the growing use of foreign investment screening in the interest of national security (Bonnitcha, 2020), and concerns about the supply of medicines, medical supplies, semiconductors, energy, food and fertilizers that arose during the pandemic and later the war between the Russian Federation and Ukraine. In that regard, concepts such as strategic autonomy, reshoring, near-shoring, and relocation to countries considered as friends and allies, known as friend-shoring and ally-shoring, have become common among authorities in Europe and the United States (Borrell, 2020, and Yellen, 2022, respectively). In 2021, both the United States and the European Union launched initiatives to enhance their manufacturing autonomy in strategic industries, including for semiconductors, electric batteries, minerals and essential materials, and medicines (ECLAC, 2021b). This renewed concern for the reliability of international supply chains, including from the political perspective, stands in stark contrast to a world in which the globalization dynamic was mainly determined by economic efficiency and profit maximization.

One consequence of the growing links between trade, FDI and geopolitics is the dilemma faced by the World Trade Organization (WTO) in creating new rules for both global trade and dispute resolution between its members. This has led to frequent calls for reform to align the Organization with the current challenges of world trade. At the twelfth session of its Ministerial Conference, held in Geneva in June 2022, an agreement was reached to formally launch the reform process; nonetheless, significant uncertainty remains as to its possible results in light of the strong disagreement on a variety of matters between its most influential stakeholders. In this context and in the absence of new, multilaterally agreed rules, trade in each region will increasingly be governed by the rules set out in the last round of megaregional agreements. Outstanding among these owing to their economic and demographic importance are the Regional Comprehensive Economic Partnership in East Asia, the Agreement between the United States of America, the United Mexican States, and Canada, and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (see figure I.6).

Figure I.6

Selected groups: share of world GDP, trade in goods and population, 2021

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Monetary Fund (IMF), World Economic Outlook Database, April 2022, for GDP and population, and World Trade Organization (WTO) for exports and imports.

Increasing regionalization of supply chains and their governance is likely and could lead to a fragmentation of world trade rules. A scenario of this sort would be particularly problematic for Latin America and the Caribbean, and especially South America; unlike other regions, they have not managed to develop a sufficiently integrated regional market to reduce their exposure to changes in their main trading partners' commercial and industrial policies. It is also unclear how and to what extent the region will be able to participate in any potential restructuring of global supply chains in the coming years. On the whole, the countries that seem best placed to benefit from such a process are those that are already embedded in international production networks centred on the United States, such as Costa Rica, the Dominican Republic and Mexico (ECLAC, 2021c).

In this context, it is important for Latin America and the Caribbean to redouble regional integration efforts. Recent evidence points to the complementarity between insertion in global value chains and the development of regional production systems by increasing regional economic integration through more and better physical infrastructure, trade facilitation efforts, and the harmonization of regulations and rules of origin (Sanguinetti and others, 2021; Rocha and Ruta, 2022).

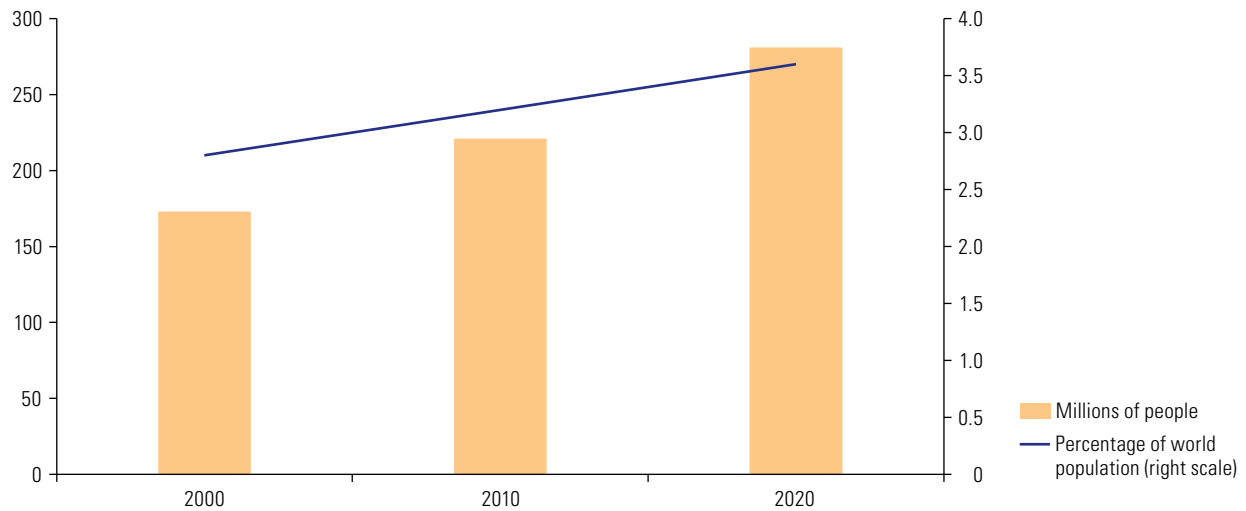
3. Steady growth in international migration flows

International migration is growing around the world, with important economic, social, cultural and political impacts on countries of origin, transit, destination and return. According to the most recent data from the Department of Economic and Social Affairs of the United Nations, 281 million people resided outside their country of origin in 2020, 3.6% of the global population, compared to 173 million in 2000 (2.8%) and 221 million in 2010 (3.2%). This is the highest figure ever recorded (United Nations, 2020a) (see figure I.7).¹¹

¹¹ The Department of Economic and Social Affairs provides global estimates of international migrant populations, mainly based on national statistics on country of birth drawn from population and housing censuses. An international migrant is defined as "any person who changes his or her country of usual residence". However, countries use different criteria to identify international migrants for statistical purposes, which affects the comparability of national statistics on international migration. While some use country of birth to define a migrant, others use country of nationality. The dates for census-taking also vary across countries.

Figure I.7

International migrants worldwide, 2000, 2010 and 2020
(Millions of people and percentage of world population)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, *International Migration 2020 Highlights* (ST/ESA/SER.A/452), New York, 2020.

Migration is triggered by various factors, including the search for better work opportunities, family reunification or humanitarian crises in countries of origin. Increased international migration, therefore, is linked to growing inequality in economic opportunities, economic and environmental crises and a pattern of humanitarian crises that is characteristic of much of contemporary migration.

The pandemic temporarily halted international migration owing to border closures and, later, mobility restrictions affecting borders (ECLAC, 2022d). According to Department of Economic and Social Affairs estimates, by mid-2020, the number of international migrants may have fallen by approximately 2 million worldwide, a roughly 27% decline in the growth projected between July 2019 and June 2020. However, since February 2022, the war between the Russian Federation and Ukraine has caused one of the fastest-growing refugee emergencies in history, and the largest since World War II (see box I.1).

Box I.1

The effects of the humanitarian crisis in Ukraine

The war between the Russian Federation and Ukraine, which began in late February 2022, has turned Ukraine into the source of a large-scale forced migration and has led to one of the largest human displacement crises in the world. In August 2022, the Office of the United Nations High Commissioner for Refugees (UNHCR) put the number of refugees and asylum seekers—that is, people in need of protection—at more than 6.6 million, a figure that exceeds the total number of immigrants and refugees who arrived in Europe from other regions over the past seven years. It is estimated that 90% of the refugees coming from Ukraine are women and children who require protection. In addition, more than 6.6 million people in Ukraine have been displaced by the war and they also require humanitarian assistance and protection.

On 4 March 2022, the European Union activated the Temporary Protection Directive, whose purpose is to alleviate the pressure on national asylum systems and enable displaced persons to enjoy harmonized rights across its territory. These rights include residence and access to the job market and housing, medical care and education for children.

UNHCR estimates that more than 3.8 million Ukrainians have registered for some form of temporary protection in Europe. Most of those forced to flee the country have gone to the Russian Federation and Poland, but a significant number have sought refuge in Germany, Czechia, Italy, Türkiye and other countries in Europe. In Latin America and the Caribbean, Mexico has become a bridge to the United States for Ukrainian refugees.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Office of the United Nations High Commissioner for Refugees (UNHCR), Operational Data Portal [online] <https://data.unhcr.org/en/situations/ukraine>.

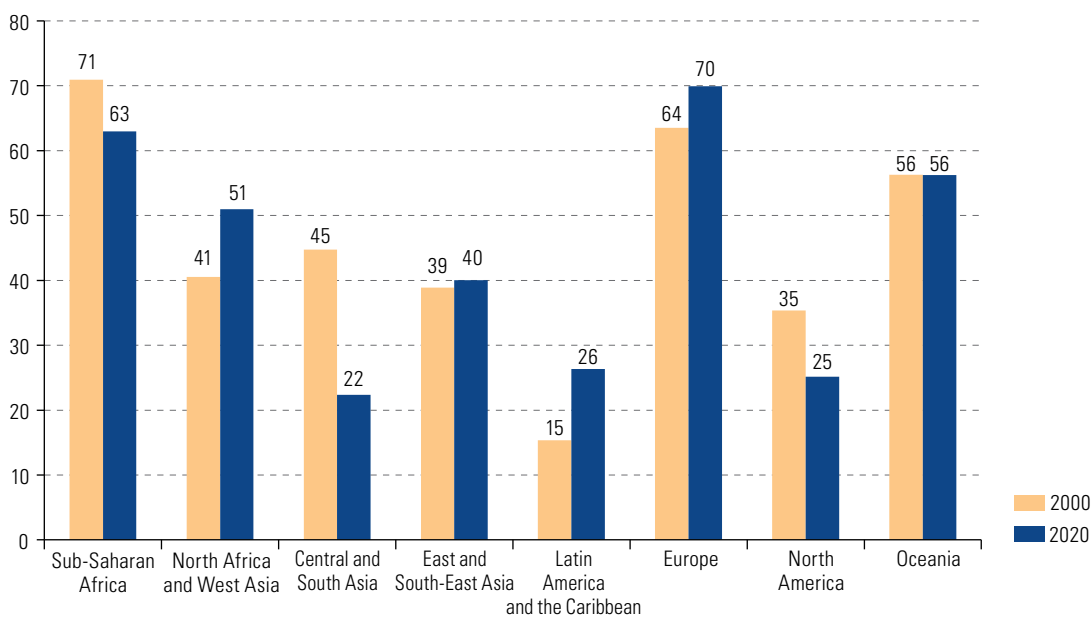
In 2020, Europe was the region with the greatest number of international migrants, 87 million, followed by North America, with almost 59 million migrants.¹² However, the latter could be overtaken by North Africa and Western Asia in the coming years.

Most international migrants come from middle-income countries; this is the case for 177 million people, approximately 63% of all migrants. Globally, in 2020, nearly half of international migrants from low-income countries of origin were refugees or asylum seekers, and approximately half of all persons undergoing forced displacement were women and children (United Nations, 2020a).

Nearly half of all international migrants worldwide lived in their region of origin. The breakdown by region, however, shows varying trends in the share of migration in each region over the past two decades (see figure I.8). Although Europe has the highest level of intraregional migration in the world, Latin America and the Caribbean have seen the highest relative growth in intraregional migration between 2000 and 2020.

Figure I.8

Proportion of intraregional migrants among total migrants, by region of origin, 2000 and 2020 (Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, “International Migrant Stock 2020” [online] <https://www.un.org/development/desa/pd/content/international-migrant-stock>.

The challenges of intraregional migration—which are linked, among other factors, to environmental vulnerability, family reunification and the ensuing migration of unaccompanied children and adolescents, and conflicts between national security policies and freedom of mobility—must be addressed multilaterally. Managing international migration requires a regional approach, establishing shared responsibilities among States and taking into account the entire migration cycle and conditions and processes for the departure, transit and destination of migrants.

4. The dissatisfaction of the middle-income strata

In many developed countries, increasing inequality and job insecurity in various sectors and economic activities since the 1980s along with slow income growth have led to a perception that the middle-income strata are in decline.¹³ The number of people living in middle-income households and the relative size of their total income have been decreasing. Intergenerational mobility has been called into question, and younger generations have

¹² For these data, North America includes the United States, Canada, Greenland, Bermuda and Saint Pierre et Miquelon. See [online] <https://www.un.org/development/desa/pd/content/international-migrant-stock>.

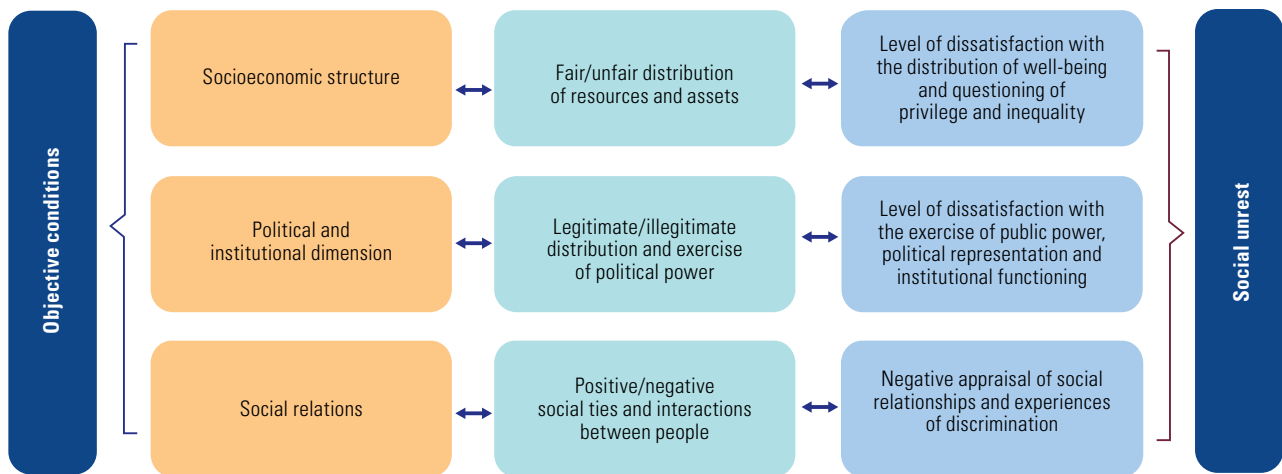
¹³ Among the methods used to estimate the size and characteristics of the middle-income strata, OECD has considered middle-income households, using indicators that include the size of the population in households with incomes equivalent to between 75% and 200% of the national median income and the relative weight of the total income of those households (OECD, 2019).

experienced the greatest challenges in achieving and retaining middle-income status (OECD, 2018). As a result, they are concerned about their lack of influence in both the economic and political future of their societies, in contrast to the growing concentration of wealth and political power in the hands of few to the general detriment of most people.

Middle-income sectors are facing growing levels of uncertainty, and when compared to the recent past (or the previous generation), have a significant sense of loss of control over their lives and well-being and those of their families. They are active participants in growing social unease linked to negative perceptions of various dimensions of social life, which are related to objective living conditions (ECLAC, 2021d). This unease can arise from disapproval of various elements of the socioeconomic structure, the political and institutional framework or social relations, and takes the form of dissatisfaction with the exercise of public power, political representation and the distribution of well-being, as well as distrust towards institutions and individuals and feelings of insecurity (see diagram I.1).

Diagram I.1

Dimensions of social unrest



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Social Panorama of Latin America, 2020* (LC/PUB.2021/2-P/Rev.1), Santiago, 2021.

Growing uncertainty and precariousness and general exasperation at the inability of political parties and traditional institutions to contain the excesses and imbalances of the current model have led middle-income groups to join the ranks of sectors that are broadly discontented, disillusioned and often ready to explore “anti-system” political alternatives. The economic anxiety and uncertainty, dissatisfaction, distrust of institutions and political parties and demand for the restoration of a decaying order that have accompanied globalization in many countries are fertile ground for populist narratives that may appeal to simplistic agendas claiming to privilege the country’s citizens at the expense of some ethnic minority, recent immigrant group or class, or a combination of the three (termed “nativist” narratives). The forces exacerbating such collective insecurity include deindustrialization and offshoring, the unintended effects of technological change, the emergence in large sectors of “winner-take-all” market economies, the erosion of safeguards and protections in the labour market and the erosion of rules that used to limit wage differentials (Rodrik, 2018, p. 2).

In addition to these factors related to globalized economies, according to Algan and others (2019), the new populist wave in the developed world is fuelled by growing social discontent and resentment towards traditional politics based on the expectation that there will be a shift towards a society no longer of classes, but of individuals who consider their position in subjective terms, and who, depending on their more or less precarious situation, either still trust or radically distrust the established order. Added to this is disaffection and the desire to break with that order in view of the ineffectiveness or inability of traditional political actors, from the right or the left, to correct the inequalities of the current economic model and meet people’s needs. In this regard, Gethin, Martínez-Toledano and Piketty (2021) note in developed countries a clear decline in the “class” vote, a change led by middle-income sectors. The behaviour of voters has also become more volatile and unpredictable in general, in particular among the youngest. Although socioeconomic factors continue to play a key role in structuring divisions along political lines, their mechanisms depend on how social inequalities are politicized in each context and the narratives and strategies that political actors use to do so.

In that context, the new populist wave is fed by mistrust of the globalized economy, traditional political parties, liberal democracy and even public policies that favour “others”. Migrants are typically identified among these “others”, as are the most vulnerable groups at times, who have been the focus of targeted social policies in the absence of a truly universal welfare state or because of eroding social welfare systems. Social unrest and the growing distrust felt by some middle-income sectors are also the result of extreme wealth concentration and the inability or unwillingness of traditional political actors to prevent it, as well as a false meritocracy in which some maintain privileges or avoid contributing to collective welfare despite benefiting from the current model (Ferreira and Scoch, 2020).

These tensions, along with the crisis of legitimacy and trust in democratic institutions, whose actions have failed to mitigate uncertainty, may favour socially conservative governments, which are against universal social policies and support a return to a market-based agenda in all areas of economic and social life. The fear and uncertainty of the pandemic contributed to the factors that can enhance the appeal of this type of leadership, in this case through the call to avoid excessive economic and labour disruption as a consequence of measures to protect health and contain the pandemic and also because of the tax burden of policies to support the well-being of the most vulnerable (Maldonado and others, 2021a and 2021b, p. 50).

Middle-income sectors take a leading role in the surge of dissatisfaction, while also facing a growing dilemma with regard to their place in society and the type of social contract they are willing to uphold, in particular when they feel that their tax contributions are disproportionate or perceive that they are not benefiting from public services or opportunities that are available to other sectors. Faced with precariousness and uncertainty, it is tempting to turn to the market to the exclusion of other ways to meet needs and face risks individually. The result is support for alternatives that promise to reduce the tax burden on the middle-income sector, sometimes at the cost of essential and accessible public services for the population as a whole, which, in practice, serves only to disproportionately reduce the burden on the most affluent.

This dilemma can also mobilize considerable support for alternatives that propose excluding certain segments of the population from eligibility to receive public services or social protection, such as migrants, in particular irregular migrants, or other marginalized groups. This is a path that not only fails to address the structural imbalances that generate uncertainty but can also contribute to deepening inequality and exacerbate polarization. It is therefore crucial, as discussed in chapter V, to rethink the social contract, addressing the needs of and risks faced by the middle-income strata and ensuring that it is one of the main sectors targeted for support from systems for general improvement in well-being and from social protection systems in particular.

5. The health crisis laid bare the acute differences among regions and countries

The COVID-19 pandemic has had severe economic and social repercussions, which have continued to the present despite the pandemic becoming less severe. From March 2020 onward, measures were implemented in almost every country in the world to limit interaction between groups of people. The economic impact was immediate. In 2020, this widespread process caused per capita world GDP to fall by 4.3%: in 91% of countries GDP declined, leading to increased unemployment and poverty.

The health emergency became a protracted social crisis, which deepened inequalities both within and among countries. The deterioration in well-being and health was amplified by structural weaknesses in health systems and social protection, particularly in developing countries.

The three key tools used to cushion the health-related, economic and social impacts of the pandemic were restrictions on movement, fiscal transfers, and development and administration of vaccines. In particular, the restrictions on movement widened income gaps, because the jobs that can be performed remotely are generally high-income. For example, in the United States, those in the low-wage brackets, who before the pandemic accounted for just 43% of all workers, accounted for 53% of displaced workers¹⁴ (Bateman and Ross, 2021). These trends were even more marked in countries with high labour informality.

¹⁴ The term “displaced” refers here to people who lost their jobs during the pandemic, and whose jobs have not recovered. The term “displaced” is used instead of “unemployed” because the official definition of unemployment entails actively searching for work. While that is the case for some, displaced individuals may also have left the labour force (Bateman and Ross, 2021).

Because vaccines were predominantly available in the most developed countries, there were large differences in vaccination rates among countries, widening health and economic gaps. By mid-2021, 46.5% of the population in the United States and Canada and 34.9% in the European Union had been fully vaccinated, in stark contrast to only 11.3% worldwide. As shown in figure I.9, high-income countries were the first to vaccinate. An average of 60% of their populations had received at least one dose by the third quarter of 2021 and more than 80% by the second quarter of 2022. Upper-middle-income countries caught up rapidly, achieving vaccination rates close to 50% by the third quarter of 2021. There is still a gap between vaccination in lower-middle-income and low-income countries on one hand and high-income and upper-middle-income countries on the other.

Figure I.9

COVID-19 vaccines and mortality, by country groups according to income level, first half of 2021 to first half of 2022



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Our World in Data, (OWID), "Data on COVID-19 (coronavirus)" [online] <https://github.com/owid/covid-19-data/tree/master/public/data>.

The vaccination gap is also reflected in mortality rates (deaths from COVID-19 per 100 confirmed cases). Although mortality rates showed little correlation with countries' level of development early in the pandemic—there were high-income countries with high mortality rates and low-income countries with low mortality rates—in the second half of 2021 vaccination started to significantly reduce mortality rates in high-income countries. Administration of vaccines also combined with an additional factor: arrival of a less deadly variant of the virus (omicron), which led to a reduction in mortality rates in almost all countries in the first half of 2022. Nonetheless, in those six months, the countries with the lowest vaccination rates—most of them less developed countries—had the highest mortality rates.

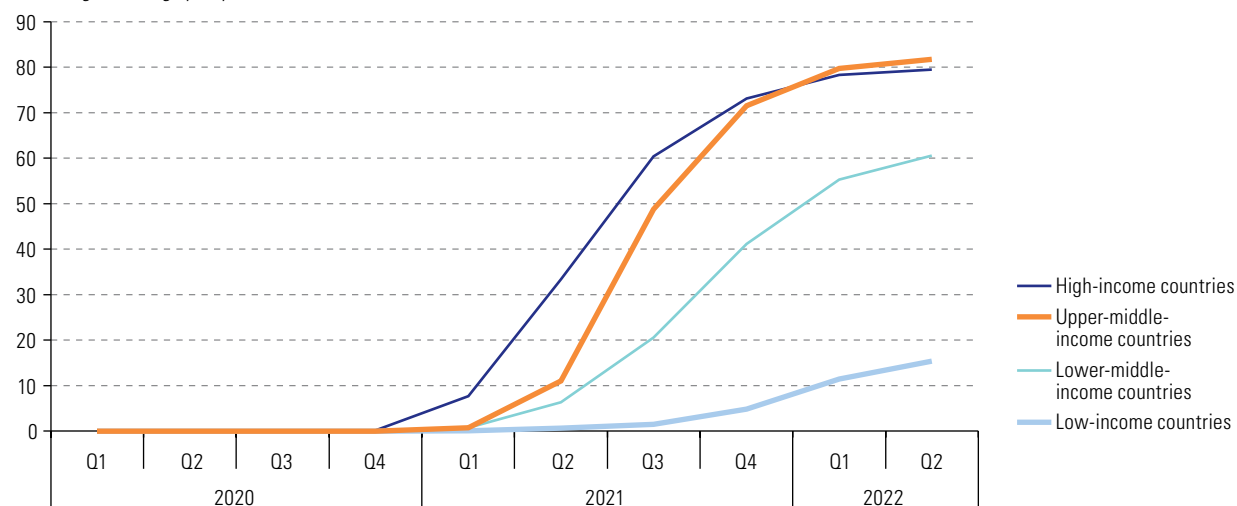
The vaccination gap also had considerable economic and social effects. Although high-income countries recorded large initial losses of hours worked (a decline of 15.6% in the second quarter of 2020, according to estimates by the International Labour Organization (ILO)), the labour market recovery reflected progress with vaccination over the course of 2021, which is not yet the case in lower- and lower-middle income countries (see figure I.10).

Figure I.10

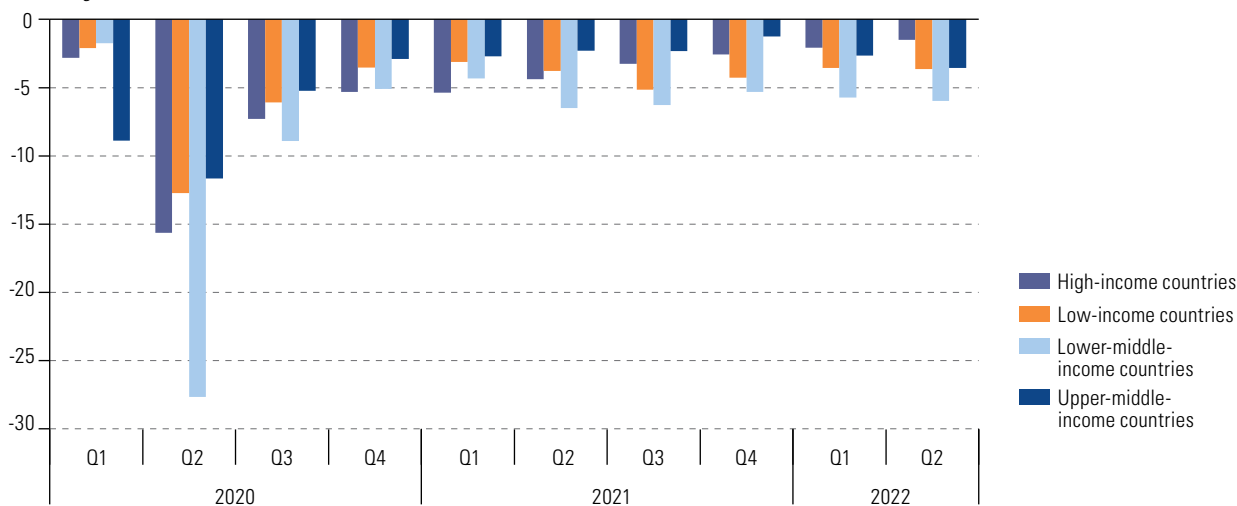
COVID-19 vaccines and labour markets, by country groupings according to income level, first quarter of 2020–second quarter of 2022

A. Vaccinated persons

(Percentages, average per quarter)

**B. Change in hours worked compared to the fourth quarter of 2019**

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Labour Organization (ILO), ILOSTAT [online database] <https://ilostat.ilo.org/> and Our World in Data, (OWID), “Data on COVID-19 (coronavirus)” [online] <https://github.com/owid/covid-19-data/tree/master/public/data>.

The effects of the pandemic on global supply —with production and distribution problems suddenly appearing in global value chains— and the responses to social pressures resulting from falls in employment and income led to an acceleration in the pace of inflation, as discussed in the next section.

B. A resurgence in inflation, across the board

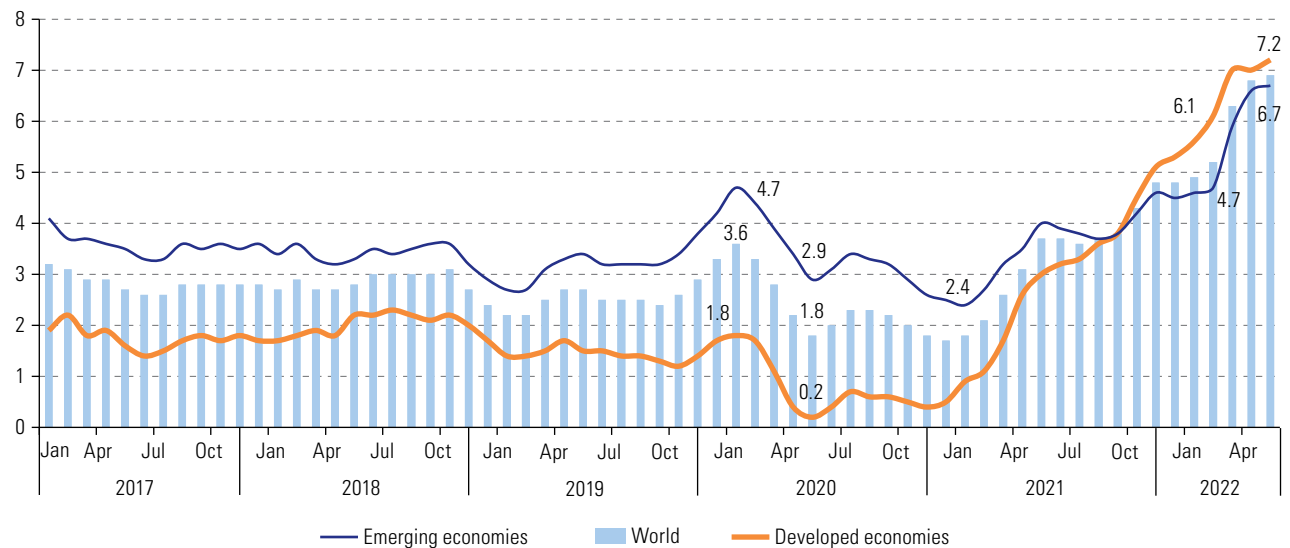
1. A worldwide trend

The inflationary process occurring in 2022 is a worldwide trend, which started in the second half of 2020, but intensified after the conflict broke out between the Russian Federation and Ukraine. As previously indicated, the COVID-19 pandemic caused one of the largest economic and social crises the world has undergone

since the post-war period, with world GDP contracting by 3.1% and global employment falling by 3.2%. This situation was widespread, affecting both developed economies and emerging and developing economies. As a result of the severe contraction in world aggregate demand, there was a sharp slowdown in inflation at the global level (see figure I.11). On average, world inflation fell 1.8 percentage points from 3.6% in January 2020 to 1.8% in May 2020. In developed economies, inflation slowed by 1.6 percentage points, from 1.8% in January 2020 to 0.2% in May 2020. In the case of emerging economies, the drop in inflation in the same period was 1.8 percentage points, from 4.7% to 2.9%.

Figure I.11

Year-on-year consumer price inflation rates, January 2017–May 2022
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Capital Economics.

Expansionary fiscal and monetary policies were adopted worldwide to mitigate the harmful impact of the pandemic on economies, stimulate aggregate demand, facilitate financing of health policies and protect the most vulnerable groups. As a result of those endeavours and the reopening of economies from the second half of 2020 onward, global economic activity started to recover and commodity prices began to rise, as did global inflation.

Figure I.11 shows the upward trend in inflation since May 2020, which has been particularly marked in developed economies, whose inflation rate climbed by 7.0 percentage points from that month through to May 2022. The rise in inflation in developed economies has been so substantial that their average inflation is above the global average. During the same period, the inflation rate in emerging economies accelerated by 3.8 percentage points. While inflation was already above pre-pandemic levels before the war in Ukraine, it has since intensified. Between May 2020 and May 2022, the rise in the inflation rate in emerging economies accounted for 52% of its overall increase in the same period (May 2020 to May 2022); the corresponding figure for developed economies was 15%.

2. Interaction of supply and demand factors

Rising inflation has been driven by the dynamics of supply and demand factors, whose relative significance has changed over time. ECLAC (2022c), Reifschneider and Wilcox (2022) and Gagnon (2022) argue that higher inflation in 2021 was driven by a recovery in consumption, supply disruptions and higher commodity prices, especially for energy and food.

The expansionary policies implemented by fiscal authorities and central banks around the world led to a strong recovery in consumption in 2021. While consumption strengthened, the pandemic triggered changes in consumption patterns, with spending shifting towards goods and away from in-person services, in the light

of restrictions on movement and other physical distancing measures that remained in effect through much of 2021. The combined effect of those demand factors pushed up prices for goods on the back of inelastic supply. In addition, global production chain problems meant that global supply, far from being able to adjust to the surge in demand, was depleted, giving additional impetus to global inflation.

Driven by the economic recovery, higher prices for international commodities, especially energy, also contributed to the uptick in inflation in 2021. Prices of energy and non-energy goods (including food) —after falling because of the pandemic— rose significantly. Between December 2020 and December 2021, the increases were 76% for energy and 21% for non-energy goods, including a 19% rise in the case of food.¹⁵

By mid-2021, although it had been accepted that inflation would rise in the year and in the first half of 2022, it was generally expected to slow, especially in the second half of 2022, as the factors that had driven it in the previous year became less prominent (*The Washington Post*, 2021; Torres, 2021). Additionally, forecasts for 2022 made at the start of the year suggested commodity prices would decline slightly, by around 3.2%, with metal and mineral prices falling the most (by 8.4% compared to the 2021 average) (see ECLAC, 2022c and Ha, Kose and Ohnsorge, 2022). The declines were based on the economic slowdown, especially in China and particularly its construction sector, where problems have emerged. Prices for energy and agricultural products were projected to remain relatively stable, with little change compared to 2021 averages (0.3% and -0.4%, respectively). Moreover, the supply of oil, natural gas and coal was expected to recover, with higher demand forecast as transportation and production continued to return to normal worldwide.

Because the impetus in inflation was expected to be limited, the world's major central banks anticipated only modest changes in monetary policy rates. However, by the end of 2021, the outlook was of inflation that was more intense and potentially longer-lasting than initially foreseen, meaning that normalization of monetary policy could be stepped up, if required (*The New York Times*, 2021). There was particular concern about pressure that may be building in labour markets, with conditions that seemed to tend toward wage rises that might be driving up costs, but also about significant price rises in the United States housing market.

In this context, the outbreak of the war between the Russian Federation and Ukraine led to a change in inflation patterns: not only did recorded rates rate climb, but medium-term expectations also rose. As a result of the conflict, commodity prices jumped higher. In fact, between December 2021 and June 2022, price increases were recorded of 52% for energy and 8% for non-energy goods, including a 19% rise for food.¹⁶ In the cases of both energy and food, more than half of the rise came after the war began. This situation also exacerbated problems in global supply chains, which had still not recovered from the difficulties caused by the pandemic, and ships have had to be diverted from the Black Sea, adding to shipping disruption and pushing shipping costs up even higher. In short, these cost factors have driven inflation in the developed world to rates not seen since the 1980s. In addition, the effects on cereal production of climate change-related phenomena such as droughts have led to heightened price pressure in the near term and increased the risk of food insecurity.

3. Central banks' strategy: normalizing monetary policy

Central banks have tended to normalize monetary policy, withdrawing aggregate demand stimulus measures. The response of the world's major central banks has been to raise monetary policy rates and reduce asset purchase programmes (ECB, 2022 and Board of Governors of the Federal Reserve System, 2022), mainly to attempt to rein in inflation expectations and prevent misaligned expectations in the medium term. However, the current situation poses a challenge for monetary authorities, as contractionary monetary policies will likely do little to alleviate inflationary pressure, which is generally fuelled by supply-side factors. Nor would such policies be effective in anchoring inflation expectations if those expectations were to move based on factors such as those related to the war, supply chain problems, rises in international transportation costs and more subdued growth prospects. The expected price trend would instead reflect expectations concerning the extent or duration of those factors. In addition, restrictive monetary policy would result in less impetus for economic activity and greater risks for financial systems, potentially heightening the threat of stagflation (World Bank, 2022).

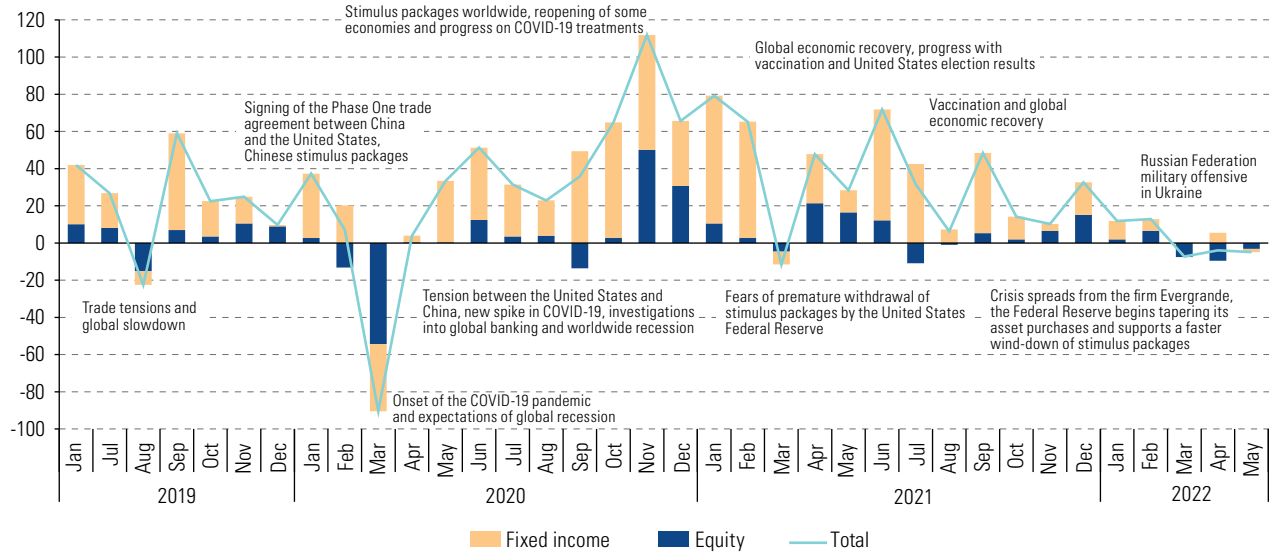
¹⁵ Calculated on the basis of World Bank, "World Bank Commodities Price Data (The Pink Sheet)".

¹⁶ Calculated on the basis of World Bank, "World Bank Commodities Price Data (The Pink Sheet)".

For emerging economies, the picture is even more complex, as inflation has also accentuated the tightening of global financial conditions seen in recent months, leading to greater volatility on financial markets. This is reflected in figure I.12, which shows the smaller inflow of capital, which could shrink further, given the risk of greater capital outflows. This could have a destabilizing effect on the real sector and on financial risk, given the connection between these flows and exchange rates.

Figure I.12

Non-resident portfolio capital flows to emerging markets, January 2019–May 2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the Institute of International Finance (IIF).

Increased financial volatility and global risk aversion because of the war in Ukraine has affected capital flows to emerging markets, triggering substantial depreciation of currencies and amplifying shocks from rising energy and food prices. These trends could become more pronounced in the coming months, especially if inflationary pressure persists in developed economies and their central banks continue to opt for more contractionary monetary policies, including monetary policy rate hikes and the withdrawal of monetary stimulus packages (asset purchases).

The COVID-19 crisis showed that central banks have the capacity to expand and draw on the tools at their disposal in times of crisis. In the current circumstances, emerging economies must continue to use various means of maintaining macrofinancial and price stability. This means that all available tools must be employed to mitigate the impact of inflation on economies and attenuate the effects of international financial volatility.

C. The environmental emergency is magnifying the effects of the economic and social crisis

1. Climate change

While the global economy is facing the growing impact of stagflation and a protracted health crisis, societies are also facing an increasingly acute environmental crisis caused by the overstepping of planetary boundaries. The most alarming indications of the environmental crisis are the loss of biodiversity and ecosystems, pollution and the threat from climate change, the signs of which are increasingly frequent and severe. Climate impacts increase the vulnerabilities already laid bare by the health crisis and high food and energy prices. Moreover, the socioeconomic impacts of those crises are preludes to the expected effects of the climate crisis.

In 2021, the combined effect of high energy prices and the impact on crops from periods of drought linked to the La Niña phenomenon in parts of Africa, Asia and Latin America led to a 26% rise in food prices¹⁷ compared to the 2014–2016 average. The war between the Russian Federation and Ukraine has led to a further rises in prices, which have hit an all-time high, almost 60% above the average for the 2014–2016 period. As a result, world hunger is on the rise, affecting nearly 10% of people globally. From 2019 to 2022, the number of undernourished people grew by as many as 150 million, reaching a total of 829 million.¹⁸

As the effects of climate change multiply, its impact on food production, health and ultimately well-being will become increasingly apparent. The average global temperature for the twenty-first century to date is approximately 1°C higher than the average for 1850–1900, reflecting warming without precedents in the last 2000 years (IPCC, 2021). This warming brings with it an increase in extreme weather events such as heat waves, storms and droughts, which affect food and water security. The droughts in 2015 and 2016, caused by El Niño, significantly reduced food availability in the Central American Dry Corridor and eastern and southern Africa. Likewise, although agricultural productivity has increased worldwide, climate change is estimated to have slowed its growth over the last 50 years, mainly affecting mid-latitudes and low latitudes (IPCC, 2022a). In countries near the equator, which are already experiencing higher temperatures, some crops are under heat stress and further rises will substantially reduce yields, with repercussions for employment and output in agriculture. Furthermore, ocean warming and acidification erode aquaculture and fisheries productivity (IPCC, 2022a).

In addition to impacts on crop yields and on food security, higher temperatures also reduce productivity and labour supply (Heal and Park, 2016) and economic growth (Dell, Jones, and Olken, 2012; Burke, Hsiang, and Miguel, 2015; Kalkuhl and Wenz, 2020). Global estimates show that the effects of a 1°C increase (approximately the current increase over the pre-industrial era) range from an increase in GDP of 0.3% for countries with average annual temperatures of 10°C to a loss of 3.5% for countries whose average temperature is around 25°C. These estimates take into account only the impacts of changes in average temperature on GDP growth, and do not consider the impacts of extreme hydrometeorological events.

Another environmental factor related to the determinants of climate change with observed impacts is air pollution. Coal-fired power generation and use of fossil fuels for transportation produce both local pollutants and greenhouse gas (GHG) emissions. Air pollution causes 1 in 6 deaths each year, equivalent to 9 million, 90% of which occur in low- and middle-income countries (Fuller and others, 2022).

The impact of climate change thus hinders achievement of several of the Sustainable Development Goals. For example, lower growth entails slower job creation and more limited capacity to eradicate poverty, while diminished agricultural yields affect the availability and price of food and therefore also global nutrition indicators. In this regard, existing inequalities will deepen, with a disproportionate impact on lower-income countries and, within countries, on the most vulnerable households.

To prevent the most severe impacts of climate change, limiting the temperature increase to 1.5°C requires a reduction in greenhouse gas emissions by 2030 of 38%–63% with respect to 2019 levels (IPCC, 2022b). This would entail an annual rate of decline of around 4%–9% over the next eight years. By the middle of the twenty-first century, emissions would need to be reduced by around 75%–98%, meaning that the global economy would be virtually carbon-neutral (IPCC, 2022b). To put this into perspective, it is estimated that the reduction in emissions¹⁹ caused by the COVID-19 pandemic amounted to a 6% fall in 2020, a figure that would have to be maintained to keep the world on a path consistent with the climate goal.

In 2019, emissions continued to grow and hit a record high of 60 gigatons of CO₂ equivalent, driven mainly by population and economic growth (IPCC, 2022b). In addition, global CO₂ emissions from combustion for energy and industrial processes returned to their pre-pandemic path, rising by 6% between 2020 and 2021 and reaching the highest annual level on record (IEA, 2022). Around 56% of emissions come from burning fossil fuels for electricity and heat, heating and cooling, and transport, 24% from industrial production of materials such as chemicals, metals and cement, and 22% from the food system, mainly from deforestation

¹⁷ As measured by the FAO Food Price Index (FFPI) of the Food and Agriculture Organization of the United Nations (FAO).

¹⁸ See [online] <https://www.actionagainsthunger.org/world-hunger-facts-statistics>.

¹⁹ Only carbon dioxide (CO₂) emissions from burning fossil fuels and industrial processes are included.

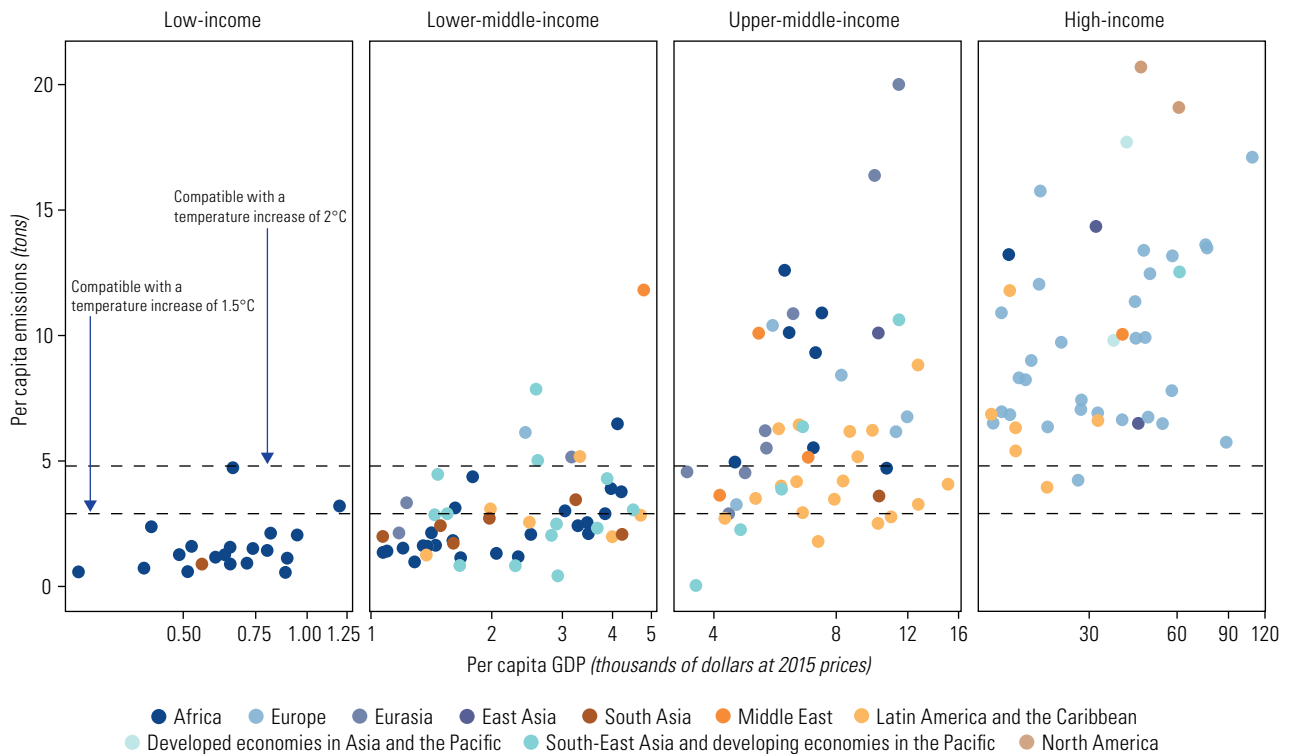
and livestock production. Thus, achieving net-zero emissions by 2050 requires rapid and profound changes to energy and food systems, mobility, industrial production techniques and nature conservation (Acemoglu and others, 2012; ECLAC, 2020). The transition also requires increased investment in sectors that can drive the economy, leading to more growth and job creation, as discussed in chapter IV and in chapter V, section A.

The effect that high energy prices will have on the transition is not yet clear. On one hand, high fuel prices put pressure on the balance of payments and on government budgets owing to efforts to control prices; this is an incentive to replace fuels with renewable energies. On the other hand, through improved returns on fossil fuel investments, high prices could drive a new wave of investment in the sector; companies from the United States have stated that they require a price of US\$ 56 per barrel to extract oil profitably (Federal Reserve Bank of Dallas, 2022), compared to a price of US\$ 118 per barrel in mid-2022. All of this is dependent on how long prices remain high.

This situation once again highlights the dual imbalance between GHG emissions produced and how their impact is distributed (Bárcena and others, 2020). Firstly, the economies that generate the largest proportion of emissions (the most developed countries) are the best prepared to address their harmful effects, while the countries that suffer most from the effects and are least prepared are those whose emissions are the lowest. Secondly, a similar pattern can be seen among social groups within countries in terms of the proportion of emissions generated and their effects: the richest groups generate more per capita emissions (see figure I.13) and are better prepared, while the poorest groups are in the opposite situation.

Figure I.13

Per capita GDP and per capita greenhouse gas emissions in the world, by income level, 2019
(Thousands of dollars at 2015 prices and tons)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the World Bank, World Development Indicators (WDI) and J. C. Minx and others, "A comprehensive and synthetic dataset for global, regional, and national greenhouse gas emissions by sector 1970–2018 with an extension to 2019", Earth System Science Data, vol. 13, No. 11, Copernicus GmbH, 10 November 2021.

2. Degradation and loss of biodiversity and ecosystem services

Loss and degradation of biodiversity and terrestrial and marine ecosystem services is another manifestation of the global environmental crisis that has important implications for economic stability and social well-being. Globally, the most relevant driver of biodiversity loss is land-use change, in particular the expansion of the agricultural frontier, which accounts for 89.8% of deforestation worldwide (FAO, 2021). In marine ecosystems, overexploitation of species caused by harvesting, hunting or capture is the greatest change driver, mainly through fishing of commercial species and bycatch of non-commercial species, whose volume can be significant (WWF, 2020).

The many ways in which climate change affects different regions (for example, prolonged drought, excessive tides or extreme temperatures) harm a variety of species and ecosystems. For example, in the scenario of a 2°C temperature increase above pre-industrial levels, the number of species threatened by extinction is projected to be 30% higher than with an increase of 1.5°C (WMO, 2022). Given the planetary scope of climate disruption, its negative effects, in synergy with other, more local triggers such as pollution, overexploitation of resources and deforestation, catalyse biodiversity loss in areas that are already vulnerable or threatened. For example, according to the latest projections of the Intergovernmental Panel on Climate Change (IPCC), the already high risk of extinction for species endemic to biodiversity hotspots would double with a temperature increase from 1.5°C to 2°C above pre-industrial levels, and, with a temperature increase of 3°C, would increase tenfold (IPCC, 2022). Other factors that directly affect biodiversity include pollution and the invasion of non-native or exotic species.

In addition to the direct causes of biodiversity loss and degradation, indirect causes, such as overpopulation, unsustainable consumption and production, cultural values, market failures and weak international, national and local governance must be addressed to achieve progress towards real and lasting solutions (IPBES, 2019). For example, government incentives or subsidies that increase unsustainable production or consumption, harming biodiversity and ecosystem health, represent approximately 2% of annual global GDP, or US\$ 1.8 trillion, even based on incomplete estimates (Koplow and Steenblik, 2022). Conversely, governments invest US\$ 67.8 billion each year in biodiversity conservation to compensate for the damage done by unsustainable production and consumption systems (OECD, 2020).

Beyond the intrinsic value of protecting the diverse lifeforms of the planet, the profound impacts of unsustainable activity on nature represent a risk to production systems and the well-being of societies and contribute to deepening global crises. For example, 75% of emerging communicable diseases are zoonotic and are related to ecosystem degradation, including forest loss. Deforestation may continue to be a major driver of future health crises (United Nations, 2021 and IPBES, 2020). The loss of coastal ecosystems, such as mangrove forests and coral reefs, reduces resilience to floods and hurricanes, which affects the well-being of between 100 million and 300 million people worldwide, in a context of increasingly frequent and severe climate change-related disasters (CBD, 2020a).

Food and food production systems are highly vulnerable to soil degradation and to the loss of pollination by fauna. Pollinator loss reduces agricultural output, wiping out an estimated US\$ 235 trillion to US\$ 577 trillion each year and affecting 75% of crops, including fruit, vegetables and export products that are important for developing regions, such as coffee and cocoa (CBD, 2020a). In addition, the accelerated loss of local varieties of domesticated animals and plants increases exposure to risks such as pathogens, pests and the impacts of climate change (CBD, 2020a). These trends have consequences for society, given that nearly half of the world's population directly depends on natural resources and many of the most vulnerable depend directly on biodiversity for their subsistence (CBD, 2022b).

Ecosystem degradation and biodiversity loss threaten both local communities and global supply chains. They are among the greatest emerging global systemic risks, along with food insecurity, and are one of the main risk management concerns for companies in the coming decade (World Economic Forum, 2022), suggesting that they are likely to be increasingly relevant in companies' investment and operating decisions. Central banks, financial system supervisors in several countries (including Chile, France, Mexico, Switzerland and the United Kingdom) and international organizations are increasingly recognizing that biodiversity is fundamental for macroeconomic and financial stability and they are developing tools and multidimensional information and creating specialized working groups to build the capacity required for a transition towards better practices in that domain (UNEP, 2022).

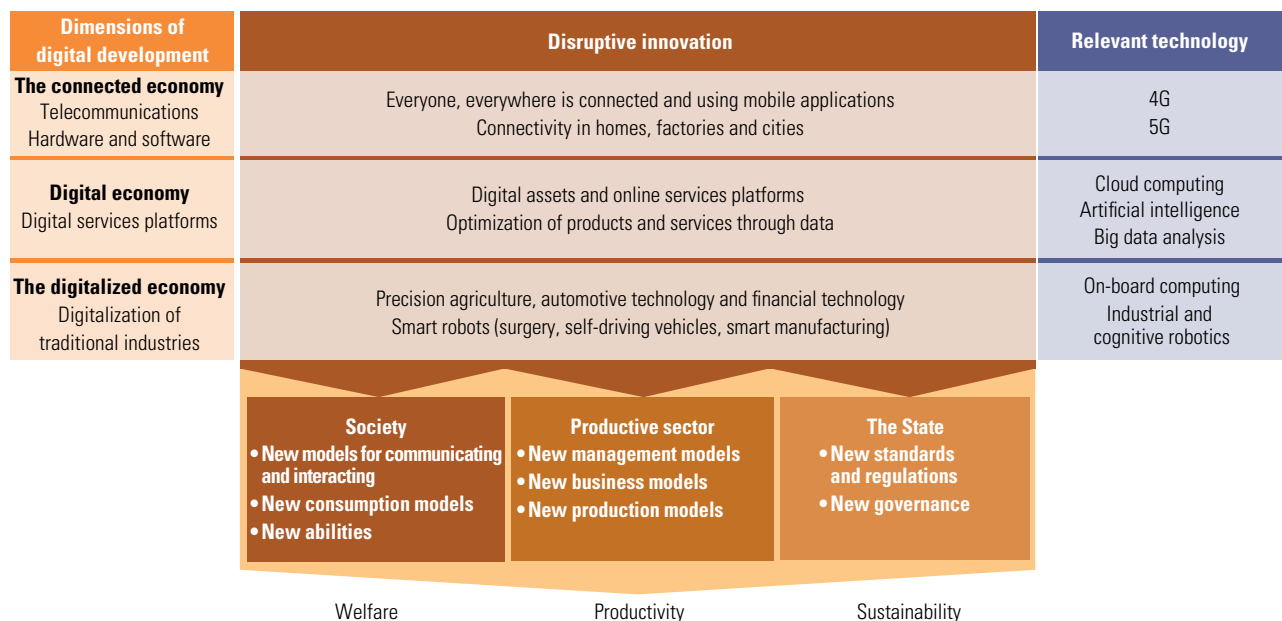
D. From the connected economy to the digitalization of the economy

Over the last decade, digital technologies have led to innovations that have driven the creation of new goods and services, business models and value networks and have triggered the emergence of new companies that have not only displaced large, established firms in various industries (including music, retail and tourism) but have also become globally dominant. Data-driven business models are permeating more and more sectors of the economy, altering production processes and value chains. These waves of creative destruction have transformative socioeconomic effects and have the potential to alter countries' development trajectories through changes to wealth generation and distribution.

There are three dimensions of digital development that are constantly evolving based on technological advances, in a process that is both synergistic, with advances in one sphere affecting progress in another, and systemic, in the sense that it has the potential to transform activities in society, production and the State and to improve well-being, productivity and environmental sustainability, albeit with risks, for example to privacy. As seen in diagram I.2, these dimensions are the connected economy, the digital economy and the digitalized economy (ECLAC, 2021b).

Diagram I.2

Dimensions of digital development and their disruptive effects on society, the production sector and the State



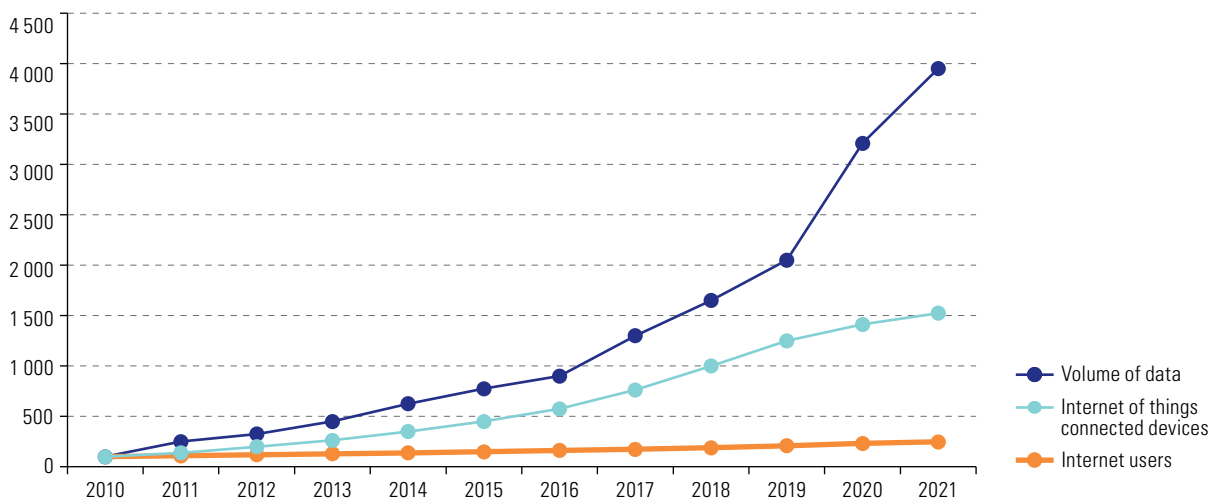
Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Foreign Direct Investment in Latin America and the Caribbean, 2021* (LC/PUB.2021/8-P), Santiago, 2021.

This is a paradigm shift, from a hyperconnected world to one that is digitalized in the economic and social dimensions, where the organizational, production and governance models of the traditional economy coexist and merge with innovations in the business, production, corporate organization and governance models of the digital economy. A new, digitally interwoven system is being forged, where models from the two spheres are integrated and interact, giving rise to more complex ecosystems that are currently undergoing organizational, institutional and regulatory transformation, and in which digital data, created by both people and machines, are becoming a strategic source of value creation (ECLAC, 2018).

To shed light on the datafication of the economy, between 2011 and 2021, global Internet penetration doubled to reach 63% of the world's population, with a total of 4.9 billion users, and the number of Internet of things connected devices multiplied by a factor of 11 to 12.2 billion devices, while the volume of data created and consumed grew sixteen times, from 5 to 80 zettabytes²⁰ (see figure I.14). In 2020 alone, the volume of data increased by 57% as a result of greater use of online solutions for work, learning, entertainment or communication during the pandemic, a trend that is only accelerating. By 2025, it is projected that 79.4 zettabytes of data will have been created just by Internet of things devices, of which there are now more than 55 billion (IDC Corporate USA, 2019).

Figure I.14

Internet users, connected Internet of things devices and amount of data created and consumed globally, 2010–2021
(Index: 2010=100)



Source: Economic Commission for Latin America and the Caribbean (ECLAC)/European Union, Regional Observatory for Digital Development, on the basis of information from IDC-Statista, June 2021 [online] <https://www.statista.com/statistics/871513/worldwide-data-created/>; Statista, November 2020 [online] <https://www.statista.com/statistics/1101442/iot-number-of-connected-devices-worldwide/> and International Telecommunication Union/ICT Indicators Database, December 2021.

The digitalization trend is also apparent in the exponential growth of international bandwidth²¹ since 2000 (see figure I.15). Over the last two decades, digital flows, in terms of international bandwidth, have multiplied by a factor of more than 1,570, growing by 38% in 2020 alone. This expansion is particularly striking when it is considered that goods and services trade flows and foreign direct investment (FDI) flows fluctuated greatly in the wake of the 2008 global financial crisis and plummeted in 2020 as a result of the pandemic, as analysed above.

Throughout that period, digital business growth remained unaffected by the problems afflicting some traditional economic performance variables and maintained an upward trend that fostered the emergence of new actors that have steadily gained in economic influence and market capitalization. As of March 2021, the digital industry was valued at more than US\$ 30 trillion, representing 29% of the market value of the 5,000 largest companies in the global economy. This valuation represents growth of some 400% between 2010 and 2021. The digital industry boom was the result of growth in online platforms and in the hardware, software and computer services sectors, which recorded an increase of more than 160% between 2019 and 2021 alone (see figure I.16).²² Currently, large technology companies such as Apple, Microsoft, Alphabet, Amazon, Nvidia, Tencent and Meta are among the most valuable in the world in terms of market capitalization. The worldwide scope of their activities means that they are the preeminent agents of globalization.

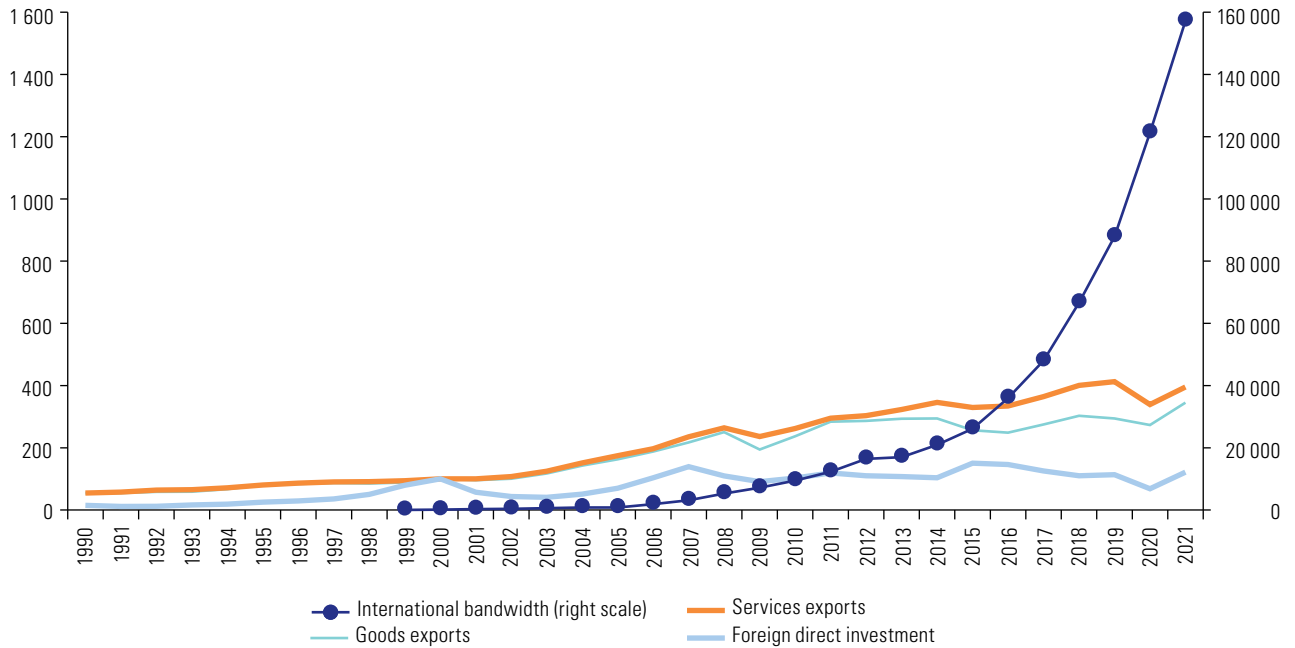
²⁰ One zettabyte is equivalent to the data contained on approximately 250 billion DVDs.

²¹ International bandwidth is the maximum capacity for data transmission from a given country to the rest of the world.

²² As discussed in detail in section F of chapter IV, in Latin America and the Caribbean, the digital industry is valued at US\$ 1.6 trillion, or 13% of the market value of the 500 most valuable companies in the region. The hardware, software and information technology (IT) services industry saw growth of more than 200% between 2019 and 2021.

Figure I.15

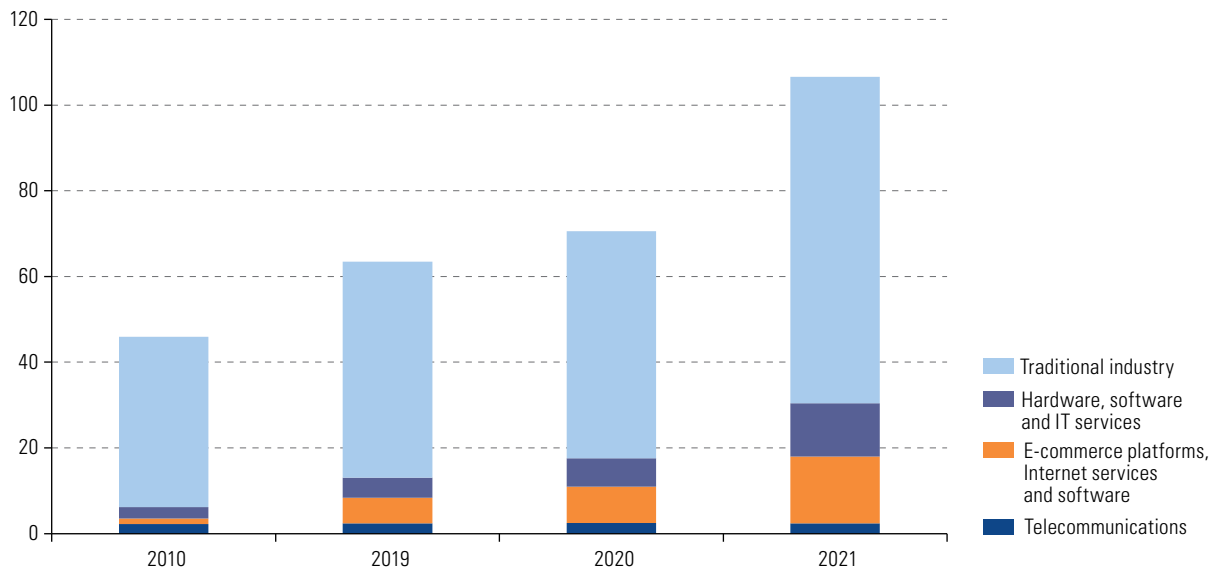
World: goods and services trade flows, foreign direct investment and international broadband, 1990–2021
(Index: 2000=100)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the United Nations Conference on Trade and Development (UNCTAD) and the International Telecommunication Union (ITU).

Figure I.16

Value of the global digital technology industry compared with traditional industries, by industry sector, 2010, 2019, 2020 and 2021^a
(Trillions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC)/European Union, Regional Observatory for Digital Development, on the basis of data from Bloomberg on the 5,000 companies with the highest market value in the world.

^a Data at 31 December 2010; 1 January 2019; 28 February 2020 and 23 December 2021.

This valuation aligns with robust consumption of the online products and services offered by digital economy firms. In April 2022, average user time on the Internet was almost seven hours per day. In fact, 59% of the world's population use social networks, double what was recorded in 2015, and this figure rises to over 80% in the United States, Canada and the countries of Europe and Latin America and the Caribbean. Some 60% of Internet users around the world buy goods or services online, which has translated into significant growth of e-commerce. It is projected that online purchases will account for 21% of all retail trade in 2022 (Statista, 2022a). In 2021, 64% of consumers used some type of financial technology (fintech) tool, mainly for money transfers and payments. Communication channels have also been expanded in the workplace: more than 80% of professionals use some combination of email, messaging services, video calling, office software and collaborative solutions daily. More than 60% of Internet users connect using personal computers and 91% use smartphones. The use of the latter has increased sharply, up from 57% in 2018 (DataReportal – Global Digital Insights, 2022). At the same time, vast numbers of mobile applications (apps) have been downloaded—37 million in the first quarter of 2022—with users spending on average five hours per day in apps (Data.ai, 2022).

The digitalization of the economy is also advancing, albeit at a slower pace. Traditional industries face the challenge of incorporating digital technologies into their products, developing digital services based on data use and incorporating robots and intelligent systems into innovation, production, logistics and marketing processes. All this requires them to assimilate developments that lie completely outside their core business. Established companies in traditional industries are therefore turning to acquisitions and partnerships as a strategy for transformation and survival, even as digital companies expand their operations in traditional industries. Over the past five years, the technology giants (Meta, Amazon, Microsoft, Google and Apple) have made a total of more than 200 acquisitions and over 100 investments, and that pace continued through the COVID-19 crisis. These acquisitions have mainly targeted technology start-ups that can strengthen the capacity of the tech giants in artificial intelligence and virtual reality, among others, and develop solutions for collaborative work, cybersecurity, industrial productivity, mobility and health (CB Insights, 2022).

Digital transformation in the industrial sectors requires data network infrastructure, terminal access points and applications to capture, store and analyse data to generate intelligence for production and business processes. Internet of things platforms and local software and cloud services provide this type of functionality, and their development over recent years reflects the digital transformation²³. As an example, Walmart is building its global Internet of things platform using Microsoft Azure to connect its refrigeration units, reduce energy consumption, and use machine learning to route its trucks and improve its supply chains. Volkswagen has partnered with Amazon Web Services and MindSphere to build its industrial cloud, connect all elements of its value chain and improve it through an online marketplace and app store. In this context, the number of operational Internet of things platforms around the world increased from 260 in 2015 to 613 in 2021, of which 44% are in the United States (41%) and Canada (3%) (see figure I.17). They serve a market that was valued at around US\$ 9 billion in 2020, providing solutions mainly focused on the manufacturing, energy and mobility sectors, followed by tools for enterprise, smart cities and health care (IoT Analytics, 2021).

The use of industrial robots in factories around the world is also accelerating. Between 2015 and 2011, the adoption rate rose from 66 to 126 units for every 10,000 employees, driven strongly by automation in the electronics, automotive and metalworking industries. A highlight of this trend is the increase in the use of collaborative robots, which doubled between 2017 and 2020 to reach 6% of annual installations (International Federation of Robotics, 2021). The use of such robots is expected to significantly improve productivity, as they can be deployed for new applications, which could also improve worker safety, for example by having robots perform risky maintenance and repair tasks.

This shows the cultural changes taking place in consumption, business and production models as a result of the digital transformation. However, the effects of digitalization are neither given nor homogenous across countries, companies and people, but rather depend on complementarity with other economic, social and institutional factors (Cimoli and Dosi, 1995). The potential benefits of digitalization for growth, well-being and

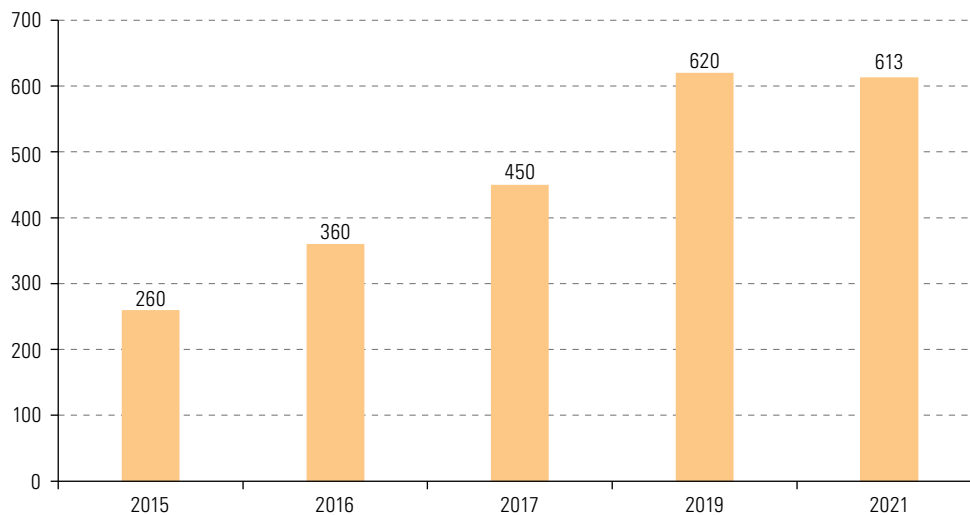
²³ An Internet of things platform is a local software package or cloud service (platform as a service [PaaS]) that monitors and can manage and control various types of endpoints, often through the commercial units of applications deployed on the platform. The Internet of things platform generally provides (or provisions) web-scale infrastructure capabilities to support basic and advanced Internet of things solutions and digital business operations (Gartner, 2022).

sustainability depend on systemic factors such as the degree of technological adoption, individual capabilities, production structures, existing infrastructure (such as electricity and transportation), innovation systems and governance that addresses emerging challenges. These challenges include market concentration, cybersecurity, employment and automation, privacy, personal data security and digital taxation. Without a systemic approach to digitalization, its positive effects could turn negative in terms of concentration and inequality, especially for developing countries that are far from the technological frontier and whose competitive advantages are based on abundant labour and natural resources (ECLAC, 2012).

Figure I.17

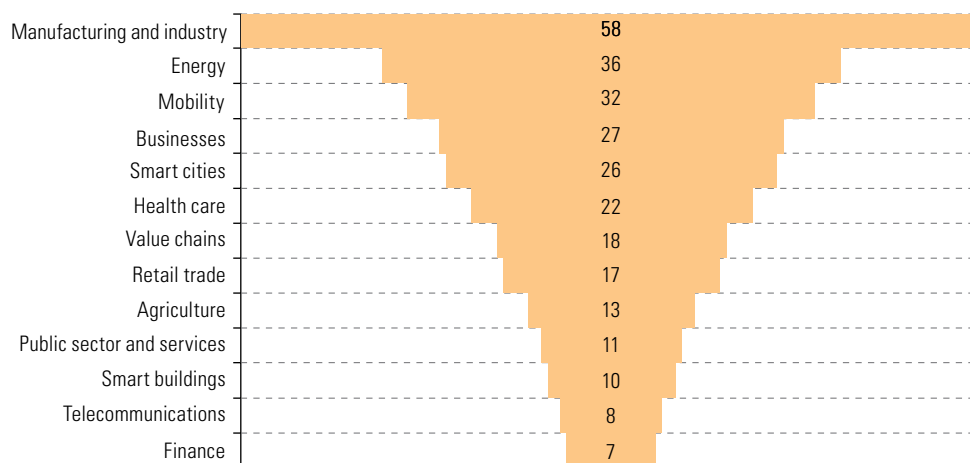
Number of operating Internet of things platforms and distribution by industry segment, 2021
(Numbers and percentages; n=613)

A. Number of platforms



B. Distribution by industrial segment^a

(Percentages)



Source: IoT Analytics, "IoT Platforms Competitive Landscape 2021", December 2021.

^a Percentages add up to more than 100% because most companies focus on several segments at once.

The digital economy is characterized by the ability to generate the increasing returns typical of the network effects of digital ecosystems, and then to use that advantage to dominate markets. This gives rise to situations in which the winners (dominant firms) make extraordinary profits and can affect competition and market entry conditions (Arthur, 1996). Over the last decade, the leading technology giants have attained global dominance

in their respective sectors. Meta, through Facebook and Instagram, accounts for 80% of social media users (StatCounter Global Stats, 2022). Google commands more than 85% of the search engine market share (Statista, 2022b) and over 70% of the smartphone operating system market share, through its Android system (StatCounter Global Stats, 2022). Apple controls 28% of the mobile vendor market share worldwide and 55% of smartphones in the United States. Microsoft maintains 76% of the market share for computer operating systems thanks to Windows. For its part, Amazon manages one third of cloud services through Amazon Web Services.

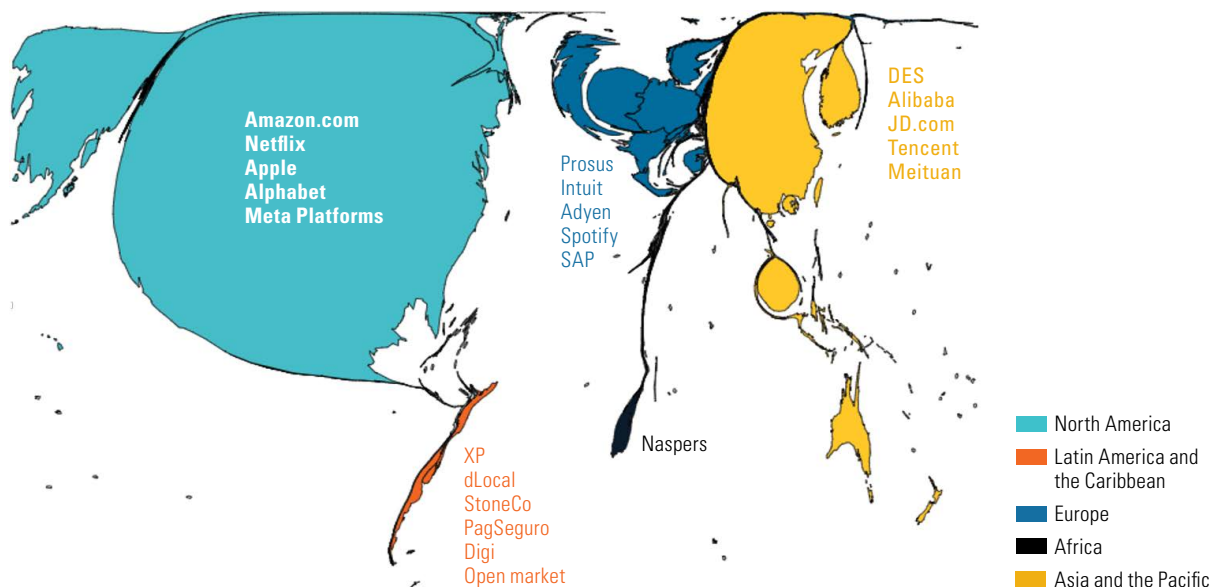
This economic power comes from the digital platform business model, which connects two groups of market agents (for example, suppliers with consumers and advertisers with search engines), and thus the platform benefits from the data exchanged by agents and from network effects, which are global in scope for this type of platform. There are also information asymmetries, inasmuch as platforms have access to large volumes of data belonging to their users, who are unaware of how the platforms work and how the data used to train algorithms are handled. Technology giants therefore have the power to define operating rules and standards. As their services spread to the various sectors of the economy, these companies are then able to define the operating conditions within their ecosystems for other companies and economic agents, exercising a somewhat monopolistic power (Dijck, Nieborg and Poell, 2019).

These micro-level gains pass through to the home countries of these companies, with geopolitical and development implications at the country level. This is particularly important given that the tech giants are largely based in the United States (72%), China (10%) and Europe (9%), which positions these economies in the lead in the new era and lays the foundation for new waves of innovation based on artificial intelligence (see map I.1).²⁴

Map I.1

The world by market capitalization value of companies in the digital economy, 2021

(Surface areas proportional to the market capitalization of companies in each region)



Source: Economic Commission for Latin America and the Caribbean (ECLAC)/European Union, Regional Observatory for Digital Development, on the basis of data from Bloomberg.

In addition to those effects, while technological innovations, in particular advances in AI and robotics, have labour-saving potential, they can also increase inequality. Technological progress in computerization seems to be skewed towards workers who perform non-routine cognitive tasks, to the detriment of workers with lower education levels who carry out routine tasks (Autor, Levy and Murnane, 2003). Even in Latin American countries, over the last two decades, there has been an increase in the demand for workers in occupations that make intensive use of cognitive skills, which pay higher wages than occupations intensive in manual tasks, leading to the polarization of the labour market and deepening inequality (Apella and Zunino, 2022).

²⁴ Preliminary data from March 2022 indicate that the share of the United States will increase to 76%.

A major problem with this new paradigm is that some countries stand to benefit significantly, while others will experience concomitant losses owing to worsening terms of trade as production savings generated by new technologies reduce the demand for unskilled labour, and even for natural resources. As discussed in chapter II, developing countries need to devise strategies to diversify production and include more technology-intensive sectors where global demand is rising. That process will entail not only pro-growth policies targeting specific sectors, but also reforming the global governance system, taking into consideration a global tax regime for the digital era, competition policies that transcend national borders and the amendment of intellectual property and data-handling regulatory regimes (Korinek, Schindler and Stiglitz, 2021).

In short, as argued by W. Brian Arthur, “modern economies have therefore bifurcated into two interrelated worlds of business corresponding to the two types of returns. The two worlds have different economics. They differ in behaviour, style and culture. They call for different management techniques, strategies and codes of government regulation” (Arthur, 1996). Moreover, “This is bringing us into a new economic era —a distributive one— where different rules apply.” (Arthur, 2017).

The digital transformation can contribute significantly not only to the recovery from and repair of pandemic-induced damage, but it can also help to address structural development problems as well as the urgent and necessary post-pandemic reconstruction and transformation. A digital society is not merely more dynamic and productive; it is also more resilient, meaning that it has greater capacity and flexibility to respond to different types of shocks and crises. However, to achieve this, the digital infrastructure (connectivity, data storage and information processing infrastructure) needed for the twenty-first century must be built. It is also essential to reduce inequalities in access and to level the playing field. Leveraging the contribution of digital transformation will require comprehensive policy frameworks and governance and implementation mechanisms, which affect the basic factors or drivers of digital transformation, including: connectivity infrastructure, regulatory frameworks, skilled human resources, and institutional and governance architectures for digital transformation (Salazar-Xirinachs, 2021).

E. From an efficiency rationale to a geopolitical rationale: the future of globalization

What is the future of globalization? This is one of the most critical questions for the 2020s and beyond. The convergence of medium- and long-term crises has brought globalization to its lowest since the end of the cold war. While the logic of efficiency based on lower production costs and increased productivity continues to be driven globally by the technological revolution, in particular digitalization, crises have disrupted investment, production and job creation efforts.

In a globalized and more interdependent world, the synchrony of upward and downward cycles has increased. When globalization is going well, it can benefit many through growth in global demand, enabling countries that apply pro-growth and job-creation strategies and policies to leapfrog up development levels. However, it also exposes countries to higher levels of risks that are beyond their control. As mentioned above, 2009 and 2020 were the first years in nearly a century in which over half of the world’s countries saw lower real per capita GDP, with knock-on effects for unemployment, poverty and inequality.

For most countries, the causes of these crises are exogenous. While the global financial crisis emanated from the United States housing market, the COVID-19 crisis and the war in Ukraine can be considered, economically speaking, to be “black swans” —improbable and unforeseeable events with significant impacts and which, in retrospect, are rationalized as having been predictable or explicable, leading to the impression that they were expected (Taleb, 2007). Even systemic disruptions like the environmental emergency and the technological revolution leave much of the world with a sense that they are suffering the effects of processes they had no part in creating. Moreover, where the individuals, policies or institutions responsible are identified, the responsibility assigned and the consequences may not appear to correlate.

Each crisis sparks new thinking in the domains of economics and policy. After the global financial crisis, the message for economists was to pay more attention to the interaction between financial variables and the real economy (Kenny and Morgan, 2011), the importance of appropriate regulation of financial markets and the economy in general. In the aftermath of the pandemic-induced crisis, the lesson was the need to place a greater focus on the interaction between health and nature variables and those of the real economy: the economy could no longer be seen as a closed system. The current period also provides an enabling environment for reviewing old paradigms, negotiating new social compacts and fiscal covenants and innovative paths forward in terms of public policy.

In each crisis, there are tools that allow some countries to respond better than others; in the 2008–2009 crisis, that included opening up space for the implementation of fiscal stimulus policies and unconventional monetary policies. The response to the 2020–2021 crisis was to promote the development and production of vaccines and State actions to efficiently halt the spread of the virus and provide resources in a timely manner to social sectors in which remote work was impossible. The availability of tools to address a crisis and the ability to use them may not be sufficient to eliminate the resultant setbacks. Negative events almost always hit the most vulnerable hardest, while the reverse is almost always true for the impacts of positive events on the powerful.

Often, policy decision makers focus on the initial downturn caused by a crisis and on the speed of the rebound or recovery. However, what really matters is how and to what degree a crisis alters economic and social structures over the medium term. In that sense, the structural effects of the pandemic, and more importantly those of the war in Ukraine, on the future of globalization remain to be seen.

Despite legitimate uncertainty regarding the effects of an ongoing black swan event, the combination of the breakdown in synergy among the three “factories” of globalization and the war in Ukraine could bolster countries’ resolve to move towards self-sufficiency and sovereignty in defence, health care, food security, access to sources of renewable and non-renewable energy and the manufacturing of strategic products, whether high-technology products (microprocessors) or mature technology products (fertilizers), and in national or regional control over the companies that produce them. Trends towards the regionalization of the global market, already present in the concept of the three global factories, could be strengthened, prioritizing investments in economies that are geographically close or based on national security criteria (in countries considered friends or allies). In this regard, it is clear that a new phase of globalization is emerging, in which geopolitical considerations take precedence over efficiency in investment decisions relating to the organization of global supply chains, and in which buoyant trade in services associated with the digital revolution and e-commerce will persist.

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CHAPTER

II

Production structure and policies for sustainable development

Introduction

- A. Patterns of structural transformation and growth: a comparative analysis
- B. There are no growth miracles, but long-term policies can redirect incentives to the most dynamic sectors

Concluding remarks

Bibliography

Introduction

Chapter I addressed the major transformations that the international economic system has been undergoing because of the impact of the pandemic and the war in Ukraine, even as the momentum of hyperglobalization has run down. This chapter discusses the structural forces that have shaped the region's performance over the past 30 years, in a comparative analysis that sets it beside other regions. These forces must be considered in any discussion of how to combine peripheral countries' development aspirations with growing instability and conflict in a world of increased geopolitical rivalry. Any effort to reform the international system with a view to maintaining the openness of the global economy and making this system conducive to development must take the need to overcome these structural problems as the starting point for its policy proposals.

The international economy presents a very mixed picture, with extremely marked economic, technological, social and environmental asymmetries between countries. These asymmetries are reflected in different rates of growth, productivity, innovation and technology diffusion, different levels of inequality in its various dimensions (in income and education and by ethnicity, race or gender), different degrees of respect for the environment and different levels of attainment of economic and civil rights. As a result, some countries and regions have made more progress towards the Sustainable Development Goals (SDGs) than others. For these to be fully attained, which is something the international community has committed itself to, it is necessary to understand the factors explaining how these asymmetries arise, are reproduced and affect this purpose.

Asymmetries are reproduced as a result of different development models, namely particular ways of combining productive, institutional and political economy factors that determine the trajectory of key variables in the economy. The Economic Commission for Latin America and the Caribbean (ECLAC) has traditionally referred to these as patterns of development.¹ Some patterns generate virtuous cumulative processes that reduce technological and income gaps and promote equality; others may take the form of low-growth traps that reproduce or even worsen initial asymmetries.²

The persistence of asymmetries and the technological and productive lag in Latin America and the Caribbean becomes clear on analysing the behaviour of productivity in the region. In the period 2000–2019, 76% of GDP growth in Latin America and the Caribbean was driven by the expansion of employment, whereas productivity gains accounted for only 24% of this growth. For China, these values are 4% and 96% respectively; for the United States, 36% and 64%; and for Europe, 54% and 46% respectively. Productivity of Latin America and the Caribbean relative to that of the United States has declined steadily since the 1980s (ECLAC, 2020). These indicators are a clear reflection of the fact that the region is lagging further and further behind the international technological frontier.

Two main arguments are developed in this chapter.

The first is that the countries that have achieved higher growth rates and narrowed their per capita income gaps with the more advanced countries (convergence) have been those that have managed to diversify their production structure towards sectors that are more technology-intensive and more dynamic in terms of demand in world markets. In other words, the production structure matters; producing technology-intensive goods is not the same as producing low-technology goods, and producing goods with a high income elasticity of demand is not the same as producing goods for which demand is expanding slowly in the world market. Some specialization patterns are more dynamic than others (on both the supply and demand sides), and this determines the long-run performance of economies.

¹ See the pioneering studies by Pinto (1973) and Sunkel (1978).

² The idea of development patterns as the outcome of the interaction between the economic, institutional and political spheres is not confined to the ECLAC tradition. It has been proposed independently by other schools of thought, sometimes as a result of dialogue between different social science disciplines. Examples are the French "regulation" school and the "varieties of capitalism" school, the latter of which has recently been analysed by Pérez Caldentey and Vernengo (2022) from the point of view of peripheral economies. In the same vein, "growth models" combine varieties of capitalism with post-Keynesian demand regimes (Baccaro and Pontusson, 2016).

The second argument is that transformation of the production structure is the outcome of policy choices rather than a destiny determined by factor endowments. Factor endowments set their stamp on the growth trajectory, but whether they are a trap or a prop for growth depends on policy. The institutional and political economy dimension evolving in tandem with the production structure determines the pattern of development. Countries that have adopted production transformation and diversification policies and sustained them over time have achieved better results in terms of long-term growth than those that have not. Understanding international convergence success stories means understanding how policies have reshaped prices and incentives to stimulate the emergence of dynamic new sectors.

The chapter consists of two sections in addition to this introduction. Section B deals with structural change and its link to growth, using different indicators of the dynamism of supply and demand in specialization patterns for this purpose. It discusses the evolution of these indicators over time and assesses their influence on growth. This section also examines the link between the production structure and the environment. The message is that a structural shift towards more sophisticated and technology-intensive sectors could not only contribute to growth but could help reduce its negative impacts on the environment. Section C discusses the policy aspects that have proved conducive to economic transformation in some countries and to low growth and low technology learning traps in others. Macroeconomic policies and industrial and technology policies (and the interactions between them) are analysed to reach an understanding of investment behaviour and the determinants of growth. Lastly, the main messages are summarized. The following chapter addresses the distributional implications of a production structure that specializes heavily in low-technology goods, and of the political and policy impacts of an extremely unequal society.

A. Patterns of structural transformation and growth: a comparative analysis

For steady progress towards the SDGs to continue, technology gaps need to be narrowed, especially in economies that are open to international competition. Incorporating technical progress makes it possible to raise productivity and sustain competitiveness, without which economic growth will be jeopardized, sooner rather than later in countries that do not issue an international reserve currency, by imbalances in the external sector that may take the form of abrupt exchange-rate devaluation crises or unsustainable external borrowing. The procyclicality of short-term capital movements and liquidity cycles in the international financial system aggravates rather than correcting the instability of growth.

1. Productive diversification, new capabilities and trade growth

It was long assumed that the pattern of specialization did not matter for long-term growth. Economies should specialize in their statically defined comparative advantages, which would allow them to maximize efficiency in the use of resources, both domestic and international. Export subsidies were seen as a gift from the government of the exporting country to the consumers of the importing country. This view, while predominant in economics textbooks, does not carry over into the actual conduct of trade policy. In some cases, the dissonance is due to mercantilist resentments that cause all imports to be seen as a surrender of markets to foreigners, without recognition of the benefits that accrue from international specialization. In others, however, it stems from the realization that not just any specialization produces these benefits; there are patterns of specialization that generate more favourable trajectories of productivity growth and distributional changes than others.

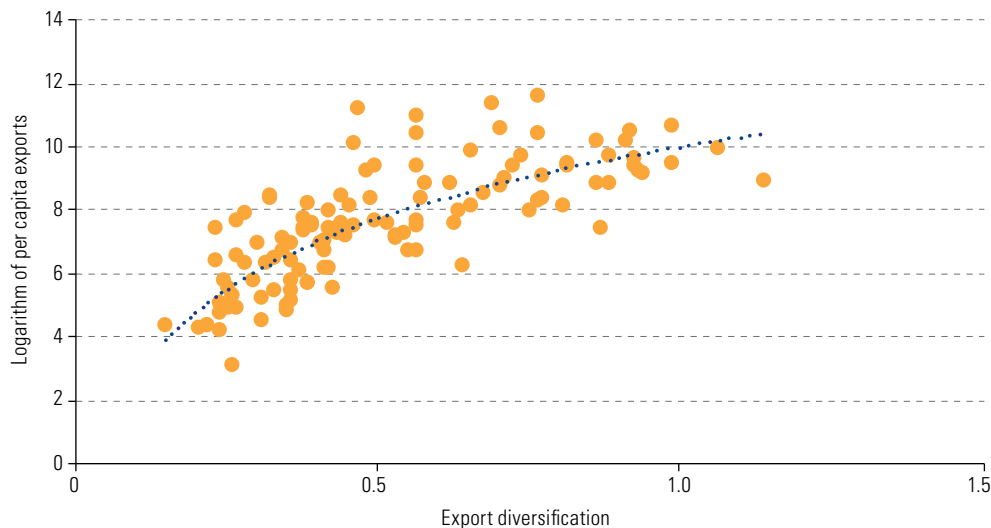
Specialization is a powerful force for productivity and growth when trade is based on an increasingly sophisticated production and technology base. The countries that trade most with each other are those that are most diversified, not those that specialize heavily in a few goods (especially commodities). This finding has

policy implications. If growth and trade can be enhanced by more diversified production patterns and these patterns do not emerge spontaneously from the initial factor endowment, there is room for policy action to transform them. Policies should be coordinated and negotiated in the international system to avoid negative sum games. To preserve an open and multilateral international system that is at the same time capable of responding to the specific problems of economic development, trade rules must recognize that different capabilities and challenges are present at the outset.

The importance of diversification for dynamic participation in the global economy is illustrated in figure II.1. The positive relationship between export diversification (represented by the inverse of the revealed comparative advantage index (RCAI)) and the level of exports per capita expressed in logarithms can be observed (see Riccio, 2022). These data indicate that productive diversification and trade are not opposed: moving towards more complex structures creates scope for more trade. The RCAI is constructed as follows. First, revealed comparative advantage (RCA) is calculated for each product in each country. In this case, the calculation is performed using trade data at the four-digit level of the Standard International Trade Classification (SITC). RCA is the ratio between the share of a good in a country's export basket and the share of that same good in world trade. Second, an aggregate indicator is calculated for each country as the sum of the RCA of each product weighted by its share of that country's exports. Lastly, diversification is calculated as the inverse of the aggregate indicator by country and period. The higher the value of the indicator, the more diversified the export basket.

Figure II.1

Revealed comparative advantage index (RCAI) and per capita exports, simple averages, 2010–2019



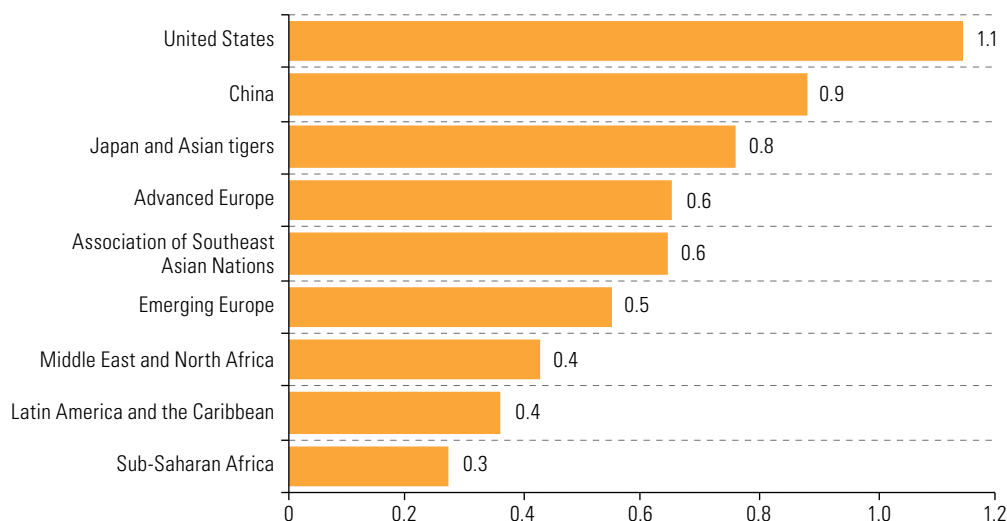
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, UN Comtrade Database; and F. Riccio "Essays on structural change, growth and distribution: an evolutionary interpretation", PhD thesis in economics, Sant'Anna School of Advanced Studies, University of Pisa, 2022.

Note: The quartile of countries with the smallest populations (all those with populations of less than 2,881,362) was excluded. Export diversification is measured as $(RCAI)^{-1}$, where $RCAI = \sum_k \frac{x_{i,k,t}}{\sum_k x_{i,k,t}} \log(1+RCA)$, with x being exports, i output, k the country, t the point in time and RCA revealed comparative advantage.

Figure II.2 shows the degree of diversification of different emerging regions and countries. It can be seen that, among the emerging regions, Latin America and the Caribbean is more diversified than sub-Saharan Africa, which is similar to the countries of the Middle East and North Africa, but less diversified than emerging Europe, China and the developed country regions.

Figure II.2

Selected regions and countries: average export diversification, 2010–2019



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, UN Comtrade Database.

Note: Export diversification is measured as $(RCAI)^{-1}$, where $RCAI = \sum_k \frac{x_{i,k,t}}{\sum_k x_{i,k,t}} \log(1+RCA)$, with RCAI being the revealed comparative advantage index, x exports, i output, k the country, t the point in time and RCA revealed comparative advantage.

2. Not all sectors are equal: Schumpeterian efficiency and Keynesian efficiency

Diversification is important, but even more important is the direction in which it goes. Some sectors of the economy have higher technology content than others, generate more opportunities for innovation and learning, and achieve more substantial productivity leaps. The more a country's exports are concentrated in these sectors, the more likely it is that innovation and productivity will occur at higher rates than in countries specializing in lower-technology sectors. Following Dosi, Pavitt and Soete (1990) and Riccio (2022), the total export share of higher-technology sectors is defined as the Schumpeterian efficiency of the specialization pattern.

In a situation where the factors of production are fully employed, output growth will necessarily be associated with productivity growth (through technical progress) or with the accumulation of those factors. Only supply-side variables play a role, not demand-side ones. The only path open for achieving a higher growth rate will then be to raise Schumpeterian efficiency. At the same time, most economies have idle or underutilized resources. This is especially true in peripheral economies, where in some cases more than half of all workers are underemployed and working informally. In these cases, expanding effective demand to absorb underemployment is crucial. But in open economies there are limits to the effectiveness and scope of demand-side policies.

We should imagine a peripheral economy whose goal is to grow at a high enough rate to absorb all subsistence jobs in the formal sector over a certain time horizon. This could be done by means of an expansionary fiscal or monetary policy designed to bring unused resources into play. But the success of such a policy of expanding aggregate demand will be conditional on export growth accompanying the growth in imports required by the increase in output and employment. As peripheral countries grow, they need to import capital goods, raw materials and consumer goods in which they are not competitive. Because this depends on the initial external financial situation, the increase in exports should also be enough to cover external debt payments or prevent an exponential increase in external debt. Thus, the risk of a purely demand-side policy is that there will be mass consumption in the periphery met by mass production in other countries. Such a path is unsustainable from a basic account balance perspective.

There are problems of effective demand that fiscal or monetary policies cannot solve. Especially in peripheral countries with high underemployment, the expansion of the economy will be checked by an external crisis before it can fully mobilize its “reserve army” from underemployment and informality.³ For this barrier to be avoided, the rest of the world’s demand for the peripheral country’s exports must grow to match the demand for imports associated with a certain rate of growth (corrected for financial commitments in foreign currency). One way of capturing this “demand-side” factor is to analyse the growth rate of global demand for the goods in which the peripheral economy specializes. The share of the sectors with the highest income elasticity of global demand in the total exports of a given country will be referred to as Keynesian efficiency. Higher Keynesian efficiency represents more room for growth before the external constraint intervenes.

A comparative discussion of the evolution of these indicators of the dynamism of specialization patterns in different regions is presented below, with an emphasis on Latin America and the Caribbean.

3. Schumpeterian efficiency and Pavitt's typology

A Schumpeterian efficiency indicator should serve to capture latent technological intensity and opportunity in different sectors.⁴ There are a number of possible indicators, each with its advantages and disadvantages. Looking at these indicators together gives a more accurate picture of how this variable behaves, as they capture different and often complementary dimensions of the technological dynamics of a sector. This section will use Pavitt’s typology (1984) to identify the sectors with the greatest technological export potential in a country. An indicator based on patents will be used in the following section.

Pavitt identifies four types of sectors in addition to the natural resources sector, according to their role in the process of innovation and technology diffusion. The description of the sectors below is based on Bogliacino and Pianta (2016). Supplier-dominated sectors are downstream in the innovation and diffusion chain, examples being agriculture and textiles, where the sources of innovation lie mainly in other sectors, in the form of inputs and equipment. Scale-intensive sectors are those dominated by large firms, such as the plastics, base metals, automotive and steel industries. Innovation occurs in products and processes and is generally incremental. Specialized suppliers include more technology-intensive firms of varying sizes (although they are smaller on average than scale-intensive ones) in the electrical machinery, equipment and scientific instruments sectors. Their innovation potential is high and usually requires very close interaction with users, as product innovations are process innovations in downstream industries. They invest in research and development (R&D), and their competitive advantages are associated with skills and learning embedded in the workforce. Lastly, science-based sectors such as pharmaceuticals and electronics are intensive in R&D (examples being the pharmaceutical, computer, communications and electronics industries) and new products, with a strong propensity to patent innovations.

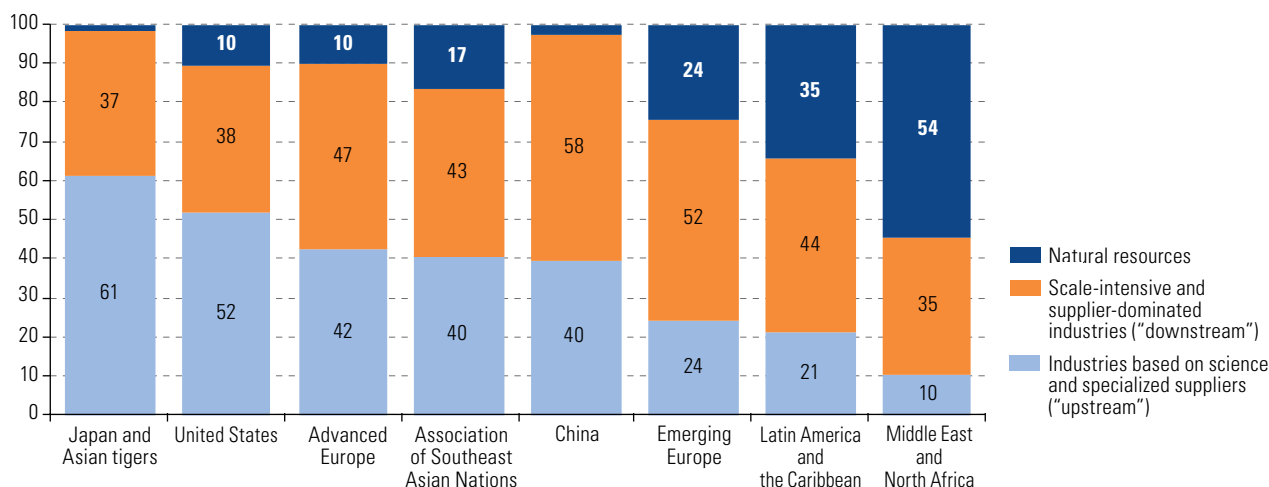
According to Pavitt’s typology, a shift in the pattern of exports from natural resources and supplier-dominated sectors towards specialized and science-based suppliers would increase Schumpeterian efficiency. Figure II.3 shows the exports of different regions on the basis of this typology. In Japan and the Asian tigers, 61% of exports come from the specialized and science-based supplier sectors, compared to 21% for Latin America and the Caribbean. The share of these sectors is very high in the United States (more than half of total exports) and in Europe, in contrast to their low share in developing economies and those caught in the middle-income trap.

³ Adair Turner (2015) has observed that, potentially, governments can always manage aggregate demand (through fiscal or monetary policy) and keep the economic system close to full employment. This argument is valid for countries that issue the international reserve currency or run current account surpluses, but runs up against obstacles in those whose pattern of specialization means they tend to run unsustainable external deficits that they have to finance in foreign currency (the “original sin”).

⁴ Technological opportunity refers to the potential of a sector to generate innovations and capabilities that have an impact on the sector’s own productivity and that of other sectors. For example, the electrical machinery sector invests more in research and development and has a higher potential for productivity gains (within the sector and in the system as a whole) than the textile industry; therefore, its technological opportunity is also higher.

Figure II.3

Selected regions and countries: export baskets by sector, according to the revised Pavitt typology, simple averages by country, 2010–2019 (Percentages)



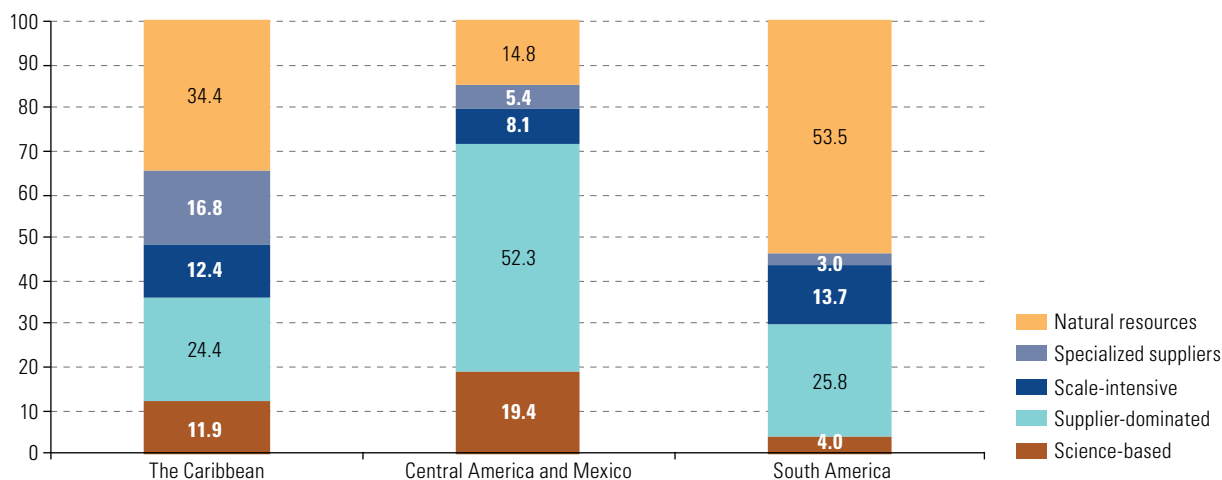
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, UN Comtrade Database; K. Pavitt, "Sectoral patterns of technical change: towards a taxonomy and a theory", *Research Policy*, vol. 13, No. 6, December 1984; and J. E. Durán Lima, M. Álvarez and D. Cracau, *Manual on foreign trade and trade policy: basics, classifications and indicators of trade patterns and trade dynamics* (LC/W.430), Santiago, ECLAC, 2016.

Note: The classification published in Durán Lima, Álvarez and Cracau (2016, p. 56) was used to translate the sectors from the UN Comtrade database into the sectors that make up each of the four groups in Pavitt's (1984) typology. A list of the sectors composing the groups of the revised Pavitt classification can be found in G. Dosi, F. Riccio and M. E. Virgillito, "Varieties of deindustrialization and patterns of diversification: why microchips are not potato chips", *Structural Change and Economic Dynamics*, vol. 57, June 2021, p. 199.

Figure II.4 deals with Latin America and the Caribbean in a more disaggregated way. It can be seen that in South America the export basket is concentrated in natural resources. In Central America and Mexico, manufactures have a greater share. However, the manufacturing exports of these countries are associated with the assembly of final goods, with a predominance of supplier-dominated and scale-intensive sectors. Much the same is true of the Caribbean, where goods exports from supplier-dominated industries account for a considerable share, although with a greater role for natural resources in this case.

Figure II.4

Latin America and the Caribbean: export baskets by sector, according to the revised Pavitt typology, by subregion, simple averages by country, 2010–2019 (Percentages)

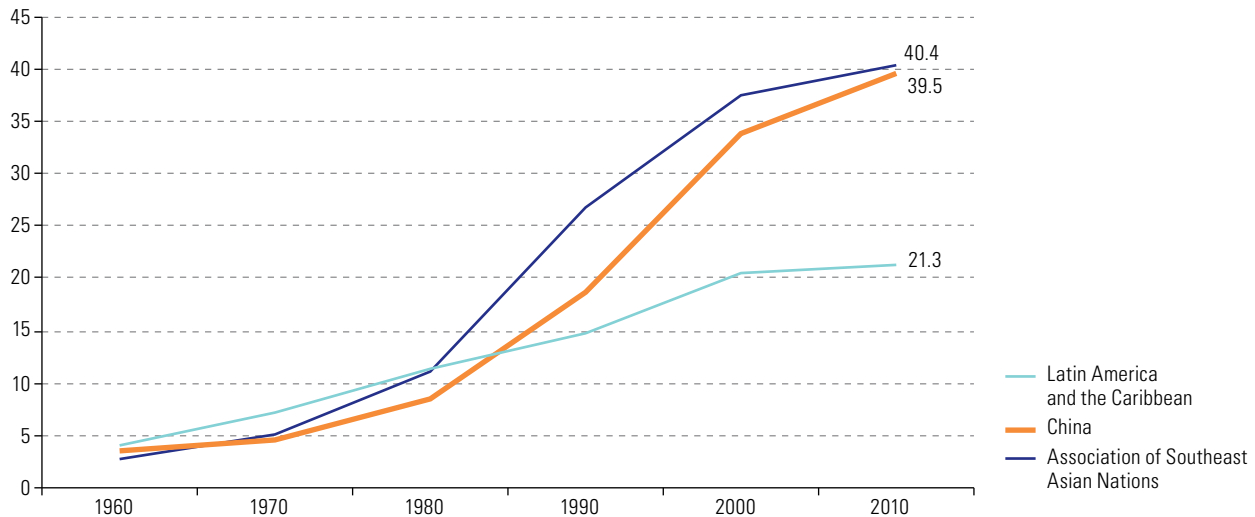


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, UN Comtrade Database; and K. Pavitt, "Sectoral patterns of technical change: towards a taxonomy and a theory", *Research Policy*, vol. 13, No. 6, December 1984.

Lastly, figure II.5 compares the evolution of the shares of exports by science-based industries and specialized suppliers in Latin America and the Caribbean and a group of Asian economies. It shows that the most successful cases of convergence in the second half of the twentieth century (the Asian countries and China in particular) achieved a rapid shift in their pattern of international trade participation towards sectors relying on science and specialized suppliers.

Figure II.5

Latin America and the Caribbean and selected Asian economies: the flight to high technology and export shares of science-based and specialized supplier industries, simple averages by country, by decade, 1960–2010 (Percentages)



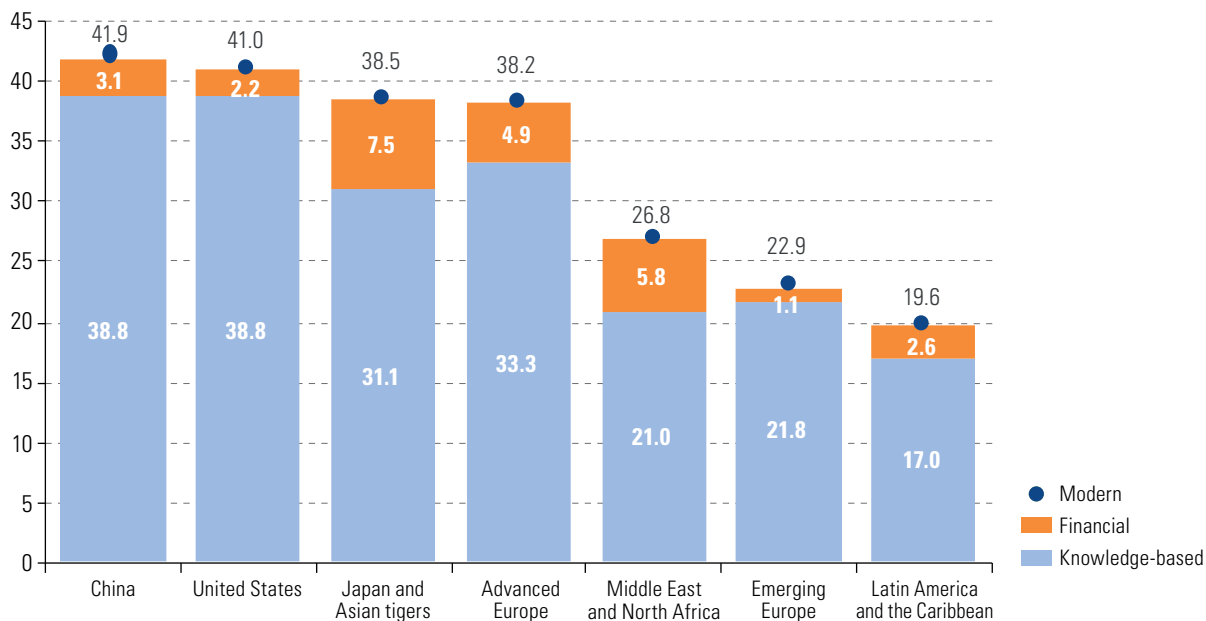
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, UN Comtrade Database.

The indicators used in this chapter were based on trade in goods. Meanwhile, exports of services have been accounting for an ever-larger share of world trade. Economies exporting raw materials or agricultural goods, which are necessarily included among the supplier-dominated sectors in Pavitt's classification (and are thus less technologically dynamic sectors), could be exporters of complex services, which have great potential for learning and for the capture of innovation rents (Mishra, Tewari and Toosi, 2020). Figure II.6 shows services exports according to their degree of technological intensity. The definition of modern services was taken from Loungani and Mishra (2014). This category was further subdivided into knowledge-based services (telecommunications, information technology and information services, royalties and licence fees, and other business services) and financial services (including insurance and pensions in addition to financial intermediation). Traditional services are transport, travel, construction, personal services and recreational services.

It can be seen that the share of modern services in total services exports is higher in advanced economies, where it represents about 40%, than in emerging or developing economies, where it represents a quarter or less of services exports. In particular, Latin America and the Caribbean is one of the regions with the lowest shares of modern services exports, suggesting that there is significant potential for growth and structural transformation of production and employment.

Figure II.6

Selected regions and countries: exports of modern services, 2010–2019

(Percentages of the total)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Monetary Fund (IMF), “Balance of Payments and International Investment Position Statistics (BOP/IIP)” [online] <https://data.imf.org/?sk=7a51304b-6426-40c0-83dd-ca473ca1fd52>.

4. Demand is not equally dynamic in the different sectors

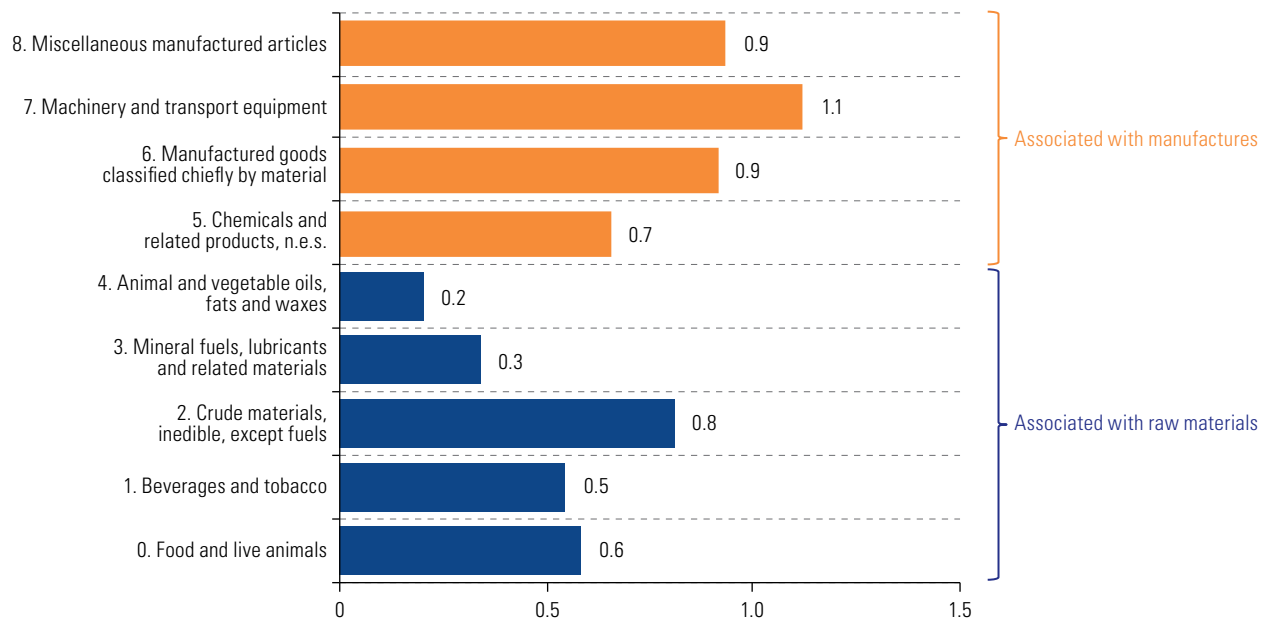
While the purpose of Schumpeterian efficiency is to capture technological opportunities, that of Keynesian efficiency is to capture the opportunities opened up by the expansion of demand and markets. As already mentioned, this can be estimated from the income elasticity of each product and its weight in the export basket of each country. This elasticity varies significantly between sectors, and the elasticity of individual sectors may vary from one period to another, depending on the income level of the countries driving the expansion of world demand.

Income elasticity is estimated by means of a regression whose dependent variable is the logarithm of exports, while the explanatory variables are the conventional ones in a demand function: the GDP at constant prices of each trading partner and the relative price of exports (calculated as the implicit price index for exports over the implicit price index for GDP), all expressed in logarithms. Fixed effects by exporting country, by trading partner and by period are included in the regression. The price variable is used to control for the effect of changes in the price competitiveness of each export product.

Figure II.7 presents the income elasticity of demand for products at the one-digit SITC level. These figures are one-digit medians of the estimates carried out on data at a two-digit level of disaggregation. It can be seen that the income elasticity of demand tends to be higher for goods associated with manufacturing and lower for those associated with natural resources. The greater the share of these resources in exports, the less sensitive they will be to the growth of the world economy. Moreover, external demand for these products is not only less dynamic, but also more subject to strong fluctuations and instability in prices and markets (Bértola and Ocampo, 2012).

Figure II.7

Income elasticity of export demand, medians of estimates at the two-digit level of the Standard International Trade Classification (SITC), 1960–2019



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, UN Comtrade Database.

The above results confirm the findings of the literature. Bottega and Romero (2021) found that the income elasticity of exports was higher in high-technology sectors (with values between 1 and 2) than in low-technology sectors (whose elasticities were between 0.2 and 0.8). Ribeiro, McCombie and Lima (2020) and Riccio (2022) report similar results. As Bottega and Romero (2021, p. 181) state: “It is noteworthy that innovation does not control for all factors comprised in non-price competitiveness. Hence, other non-price factors are still captured in the income elasticities of demand”.

The same is true for the income elasticity of demand for services exports. The elasticity of modern services is 3.1, while that of traditional services is 2.5. Again, the more technology-intensive the services, the higher the demand-side growth of exports.⁵

In sum, the demand side evinces a variance in export dynamics that does not appear in a purely supply-side analysis. The fact that more technology-intensive sectors also have a higher average income elasticity of demand implies that Keynesian efficiency and Schumpeterian efficiency overlap to a high degree. Keynesian efficiency and Schumpeterian efficiency can interact positively and generate virtuous circles, and this is a major source of increasing returns involving innovation, structural change and growth, as will now be discussed.

⁵ The definition of “modern services” is based on Loungani and Mishra (2014). They include telecommunications, computers and information, royalties and licence fees, insurance and pensions, finance and other business services. Traditional services refer to all other services. The values are simple averages of estimates for selected countries over the period 1980–2019. The countries included in are: Brazil, Chile, China, Colombia, Costa Rica, Cyprus, Denmark, Dominican Republic, Finland, France, Germany, Greece, Hungary, Israel, Italy, Malta, Mexico, Morocco, Netherlands, Norway, Pakistan, Poland, Portugal, Romania, Singapore, Republic of Korea, Sweden, Switzerland, United Kingdom, United States and Uruguay. The estimates were made by ordinary least squares with logarithmic variables, using as independent variables the world GDP at constant prices as estimated by the World Bank and the real effective exchange rate as calculated by the International Monetary Fund (IMF).

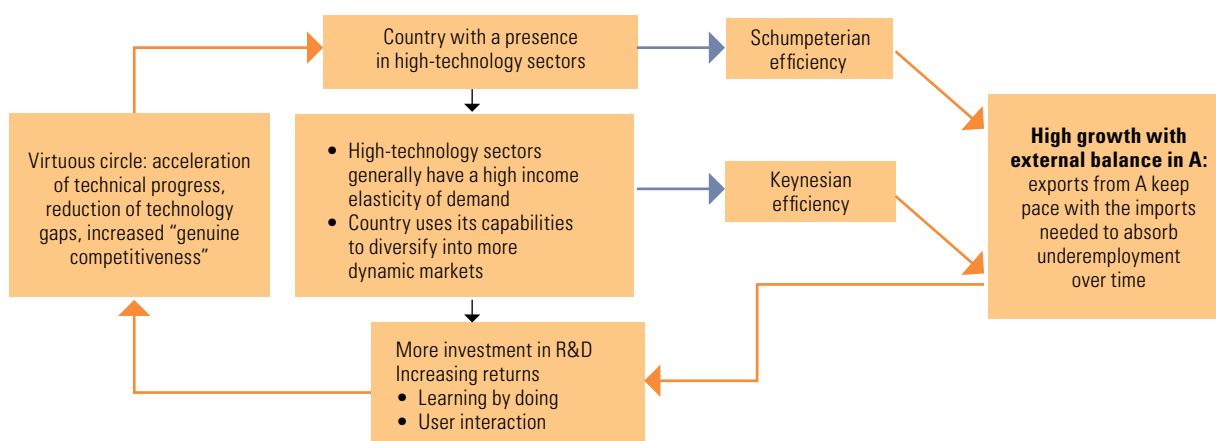
5. Increasing returns from the interaction between technology and demand growth

There are virtuous processes that arise from the interaction between Schumpeterian efficiency and Keynesian efficiency. Let us imagine a technology-intensive sector in which innovators find opportunities to achieve major productivity leaps; let us also assume that this sector has a low income elasticity of demand and that its global market is therefore growing by less than global GDP. Innovators will be able to expand their production by squeezing out other firms as their innovations make them more competitive. But once markets have been concentrated, the highest rate at which a firm's output can grow will be the trend rate (low by assumption) at which the world market grows. For this reason, firms with sophisticated technological capabilities will not want to remain in that sector, but will seek to diversify their sales into sectors where demand is expanding faster.

This positive interaction between supply-side factors (Schumpeterian efficiency) and demand-side factors (Keynesian efficiency) is portrayed in diagram II.1. Firms in country A have capabilities that they use to gain share in sectors with higher income elasticities of demand, thus accelerating their growth and making more resources available for investment in R&D. This makes it more likely that they will be able to innovate and extend their advantage in the next period. If their competitive advantages increase, they will be able to expand their sales and market share yet further in a second round. Markets become concentrated over time and gaps widen thanks to the growing returns on learning and production.

Diagram II.1

Interaction between the different types of efficiency



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

To capture this interaction, two additional indicators of Schumpeterian efficiency and Keynesian efficiency were constructed, the patent revealed comparative advantage (PRCA) index and the export pattern dynamism index. Both indicators are based on Riccio (2022).

PRCA is measured by the share in a country's exports of goods whose share of world patents is higher than their share of world trade. Accordingly, we estimate a PRCA index by calculating the ratio between (a) a product's registered patents as a percentage of world patents and (b) that product's share of world exports. The share in the country's exports of products whose PRCA index is 1 or more during the period under consideration is then computed. The value obtained provides an indicator of the Schumpeterian efficiency of the export basket.

The Keynesian efficiency indicator is also calculated in two steps. First, the elasticity of demand for each product is estimated from two-digit trade data according to the SITC classification, as explained above. Once the elasticities are obtained, the weighted average of the income elasticities of the country's exports is computed, with the weight of each product being given by its share in the export basket, taking two-digit trade data as the basis. This weighted average provides an index of the dynamism of the demand-side export pattern.

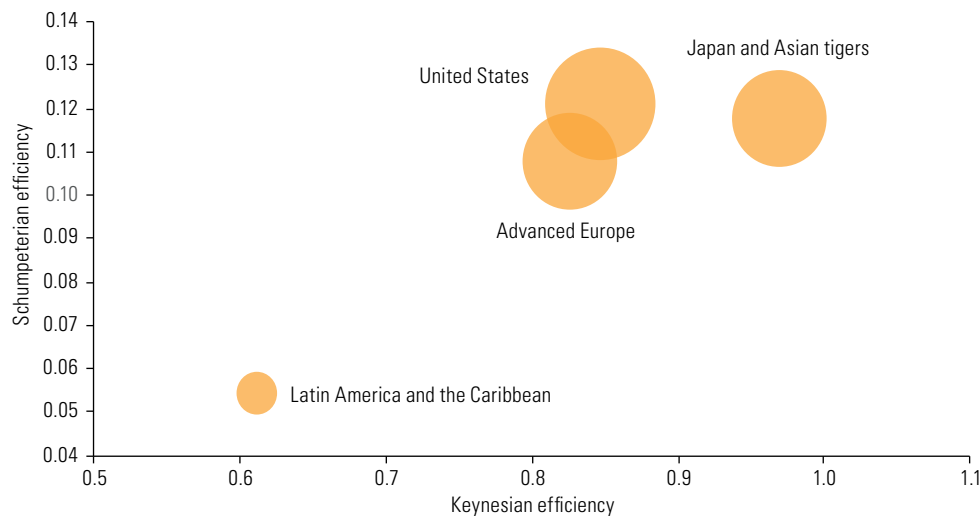
Figure II.8A combines the two indices representing Schumpeterian efficiency (ordinates) and Keynesian efficiency (abscissae) in order to compare Latin America and the Caribbean with other regions of the world. The following aspects stand out in this comparison. First, the two elasticities are positively associated. Second, on both indices, Latin America and the Caribbean lags behind advanced economies that have attained higher levels of per capita income, such as the United States, Japan, the so-called Asian tigers and a group of European economies. Third, as shown in figure II.8B, Keynesian efficiency and Schumpeterian efficiency are also lower in Latin America and the Caribbean than in those emerging regions that have shown high growth and a persistent narrowing of income gaps in recent decades, especially China. This is in line with the idea that Schumpeterian efficiency and Keynesian efficiency are mutually reinforcing, as illustrated in diagram II.1.

Figure II.8

Latin America and the Caribbean and groups of advanced and emerging economies: technological dynamism and demand dynamism go together and reinforce each other

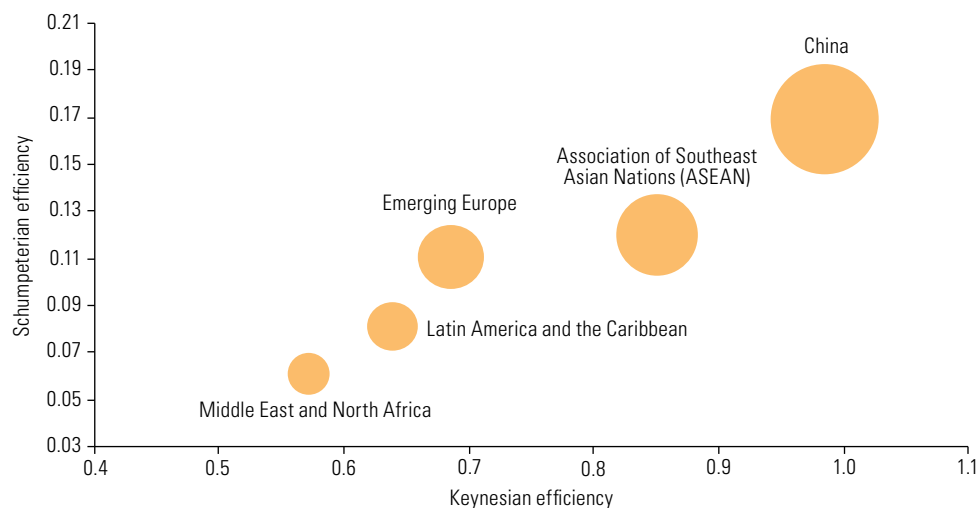
A. Latin America and the Caribbean and groups of advanced economies

(The size of the circles indicates the level of per capita GDP)



B. Latin America and the Caribbean and groups of emerging economies

(The size of the circles indicates the growth rate of per capita GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, UN Comtrade Database.

Note: Values are simple averages by region for the period 2010–2019. The Middle East and North Africa includes Algeria, Armenia, Bahrain, Egypt, Georgia, Iraq, the Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Syria, Tunisia, Turkmenistan and the United Arab Emirates; the Association of Southeast Asian Nations (ASEAN) includes Indonesia, Malaysia, the Philippines and Thailand; emerging Europe includes Albania, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Kazakhstan, Montenegro, North Macedonia, Poland, Romania, the Russian Federation, Serbia, Türkiye and Ukraine.

Schumpeterian efficiency is the sum of the share in a country's total exports of goods for which $PRCA > 1$, where $PRCA$ is the good's share of world patents divided by the good's share of world exports. Goods with $PRCA > 1$ are considered to offer the most opportunities for innovation. Keynesian efficiency is the average of the income elasticities of the different exported goods weighted by their share in the country's total exports.

In sum, levels of Schumpeterian efficiency and Keynesian efficiency are found to be correlated with per capita income and, in the case of emerging economies, with the speed of convergence towards the income levels of the most advanced economies.

6. Keynesian efficiency and economic growth

Dosi, Pavitt and Soete (1990) dubbed Keynesian efficiency "growth efficiency" in an economic model where the impact of technical change on growth is mediated by its effects on competitiveness and the ability to expand participation in domestic and external markets. It has been argued that this competitiveness offers greater scope for economic growth uninterrupted by phases of expansion and contraction due to recurrent external crises.

Table II.1 presents a dynamic panel exercise that uses Keynesian efficiency, the investment rate and exports per capita as explanatory variables for economic growth. The estimation employs the Arellano-Bond method for the period 2000–2019 and includes 162 countries. Keynesian efficiency is found to make a significant contribution to growth across economies.

Table II.1
Keynesian efficiency and growth: an empirical exercise

gypc	Coefficient	Robust standard error	z	P>|z|
L1.	0.05464	0.1272213	0.43	0.668
L2.	0.0051253	0.0235872	0.22	0.828
lnypc	-6.982588	2.184596	-3.20	0.001
lnxpc	6.02787	1.805009	3.34	0.001
fbkf	0.1563541	0.0543	2.88	0.004
EK	4.001498	2.214674	1.81	0.071
_cons	10.24511	6.025845	1.70	0.089

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Note: The estimation includes 162 countries and the data are sourced from the COMTRADE and CEPALSTAT databases.

gypc: per capita GDP growth rate

L1: variable with a one-year lag

L2: variable with a two-year lag

lnypc: Logarithm of per capita GDP

lnxpc: Logarithm of per capita exports

Fbkf: Gross fixed capital formation (percentages)

EK: Keynesian efficiency

cons: constant

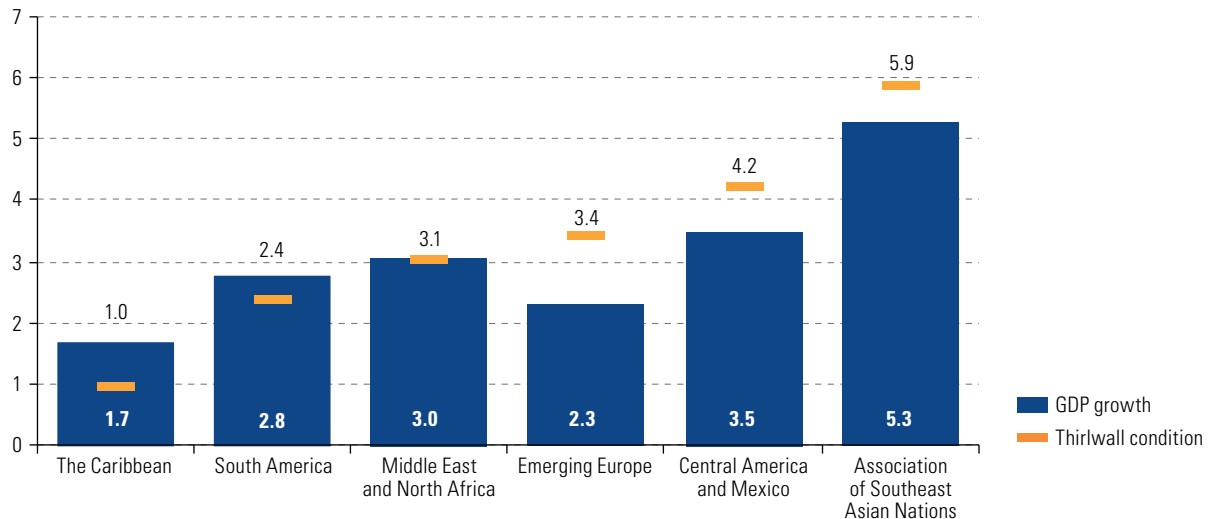
In sum, diversifying the production structure towards goods with greater Keynesian efficiency leads to a path of higher growth and learning. Together with Schumpeterian efficiency, this can generate a virtuous circle that explains convergence processes. Latin America and the Caribbean has lagged behind in this process, for reasons that lie in the particular configuration of both macroeconomic and industrial and technology policies that has characterized the region. Overcoming the middle-income trap requires these policies to be recast, as discussed in section B.

7. Differences in the international trade position of different subregions in Latin America and the Caribbean

The behaviour of the income elasticity of export demand varies from region to region. It tends to be lower in the South American economies and higher in the economies of Central America and Mexico, where manufacturing exports have continued to play a larger role, as shown in figure II.9.

Figure II.9

Selected regions: income elasticity of exports



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Over the last four decades, Central America, Mexico and the Dominican Republic have shared an export-oriented growth model. Thanks to the removal and reduction of international trade restrictions, and by means of unilateral initiatives and the signing of bilateral and multilateral agreements, together with policies to attract foreign direct investment (FDI) and promote exports, these eight economies have become some of the most open in Latin America and the Caribbean.⁶ The creation of various tax incentive regimes, such as maquila and free trade zones, helped to attract multinational companies that set up major export platforms in the subregion.

Total exports from Central America and the Dominican Republic increased from US\$ 12.2 billion in 1990 to US\$ 112.5 billion in 2021, representing an average annual growth rate of 7.4%. Mexico's total exports amounted to US\$ 521.807 billion in 2021, up from US\$ 48.816 billion in 1990, giving an average annual growth rate of 7.9% (see table II.2).

Favourable export numbers, however, do not necessarily imply higher growth. Exports contain a large component of extraregional imports. Table II.2 allows two stylized facts to be distinguished: import growth that is as strong as (and sometimes stronger than) export growth, and a moderate rate of expansion of economic activity, with the exceptions of the Dominican Republic and Panama and, to a lesser extent, Costa Rica. The results are in line with the idea that the external constraint should be seen from the perspective of the dynamism of both exports and imports and the set of technological capabilities that support them. The low domestic value added of these countries' exports largely explains why the export effort has not translated into faster growth in economic activity.

⁶ According to the ratio of total imports and exports as a percentage of $100[(X+M)/GDP]$.

Table II.2

Latin America (8 countries): real GDP, exports and imports, average annual growth rates, 1990–2021
(Percentages)

	GDP	Exports	Imports
Costa Rica	4.2	8.4	7.5
Dominican Republic	5.2	8.1	8.6
El Salvador	2.4	7.2	7.6
Guatemala	3.6	7.6	9.2
Honduras	3.5	7.9	9.3
Mexico	2.1	7.9	7.9
Nicaragua	3.2	9.5	8.4
Panama	5.1	6.0	5.9

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures.

Central America is the most integrated subregion in Latin America and the Caribbean where trade is concerned. The share of intraregional exports in the Central American total increased from 22.2% in 1995 to 31% in 2019.⁷ Despite their weight and dynamism, however, intraregional exports have had only a weak growth-enhancing effect.

In 2014, gross exports between the countries of Central America, the Dominican Republic and Mexico totalled US\$ 21.855 billion. The input-output matrix shows that each dollar exported from Central America, the Dominican Republic and Mexico to the subregion itself incorporated 62 cents of domestic value added, 3 cents of intraregional foreign value added (i.e. intermediate inputs from within the region), 34 cents of extraregional imported intermediate inputs and 1 cent corresponding to the payment of taxes, freight and insurance. Exports from Central America, the Dominican Republic and Mexico to destinations outside the region (rest of the world) generated 2 cents more domestic value added per dollar exported (i.e. 64 cents), while requiring 1 cent more in intermediate imports. The contribution of intraregional foreign value added was lower in this trade, at only 0.4 cents.

The domestic value added of the subregion's exports is relatively low when compared with the local content of exports from other regions. Taking the Organisation for Economic Co-operation and Development (OECD) countries over the period 1995–2018 as a benchmark, domestic value added averaged 75.6% of total gross exports. In countries such as the United States, Japan, Australia, Norway, Chile, the United Kingdom and Germany, this proportion was between 80% and 90%, while in countries such as Italy, France and Greece it was between 75% and 79%. In the case of Mexico, domestic value added as a share of exports averaged 66.6% for the period of analysis (1990–2021).

In sum, intraregional exports incorporate a large component of extraregional inputs; there is no evidence that long and deep intraregional production chains exist; the intraregional foreign value added of extraregional exports is even lower than that of exports to the region itself; and the share of domestic value added in the gross value of exports is lower in the subregion than in the most advanced economies. These factors explain the limited pull effect that Mexican and Central American exports have on the economy as a whole and show the need for them to be integrated into a denser production matrix.

⁷ In 2015 and 2016, the share of intraregional exports reached a record high of 33%. The information shown below is based on the regional input-output matrix for 2014 constructed as part of a technical collaboration exercise between ECLAC and the central banks and statistical institutes of the countries in the subregion.

8. The production structure and greenhouse gas emissions: structural change can also bring environmental benefits

Growth cannot continue on the unsustainable trajectory followed by the countries that are now developed, nor that of those countries which have narrowed the income gap with the latter in recent years, particularly in Asia. The reason lies not only in the high and increasing costs of climate inaction or the fact that there is less and less time to take action to prevent the earth's temperature from rising by more than 2°C, but also in the opportunities that are opening up for a new generation of pro-sustainability policies with the potential to drive a new development cycle.

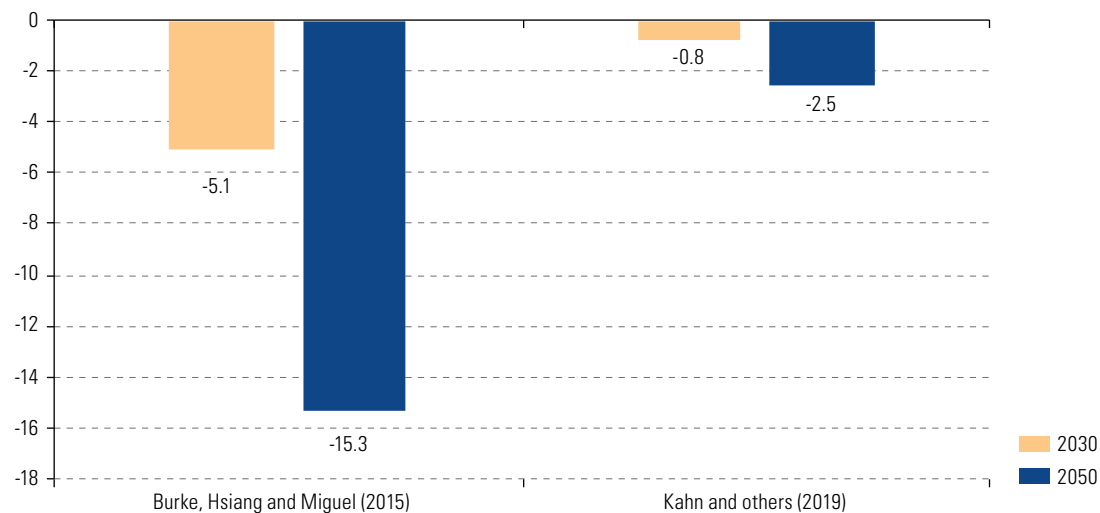
Studies by Burke, Hsiang and Miguel (2015) and Kahn and others (2019), using data for 25 countries in Latin America and the Caribbean, make it possible to estimate the impact of a high emissions scenario for the region and compare it with the global impact for the years 2030 and 2050. In a high emissions scenario, global per capita GDP losses range from 0.8% to 5.1% in 2030 and 2.5% to 15.3% in 2050 (see figure II.10). According to estimates by Burke, Hsiang and Miguel (2015), the negative impacts of temperature rise are larger for the region than for the rest of the world, at 6.3% in 2030 and 23% in 2050. This is because, according to the study's hypothesis, the countries in the region are close to or above the optimal temperature threshold, so that temperature increases would have a more harmful effect. However, in the results obtained by Kahn and others (2019), the regional impacts are practically the same as the global average. The difference arises because Kahn and others (2019) consider that the impact of temperature on GDP derives from persistent temperature deviations from the historical average. Estimates by ECLAC for the countries of the region (Samaniego, Sánchez and Alatorre, 2022) put the impacts on per capita GDP at 1.3% by 2030 and 3.3% by 2050.

Figure II.10

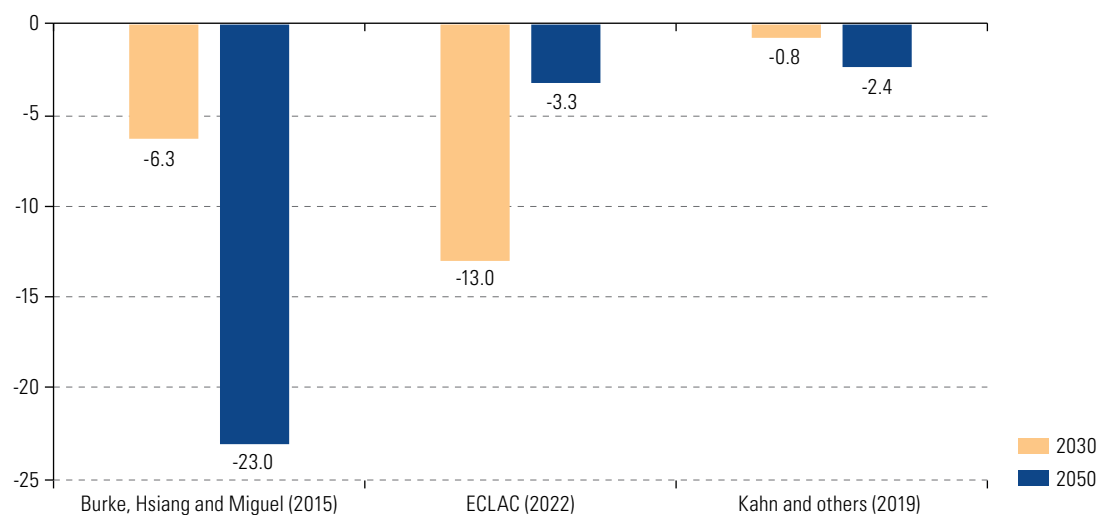
World and Latin America and the Caribbean: reductions in per capita GDP due to temperature increases in a high emissions scenario, 2030 and 2050

(Percentages)

A. World



B. Latin America and the Caribbean



Source: Economic Commission for Latin America and the Caribbean (CEPAL), on the basis of M. Burke, S. Hsiang and E. Miguel, “Global non-linear effect of temperature on economic production”, *Nature*, vol. 527, November 2015; M. E. Kahn and others, “Long-term macroeconomic effects of climate change: a cross-country analysis”, *NBER Working Papers*, No. 26167, National Bureau of Economic Research, August 2019; and ECLAC, *Social Panorama of Latin America, 2021* (LC/PUB.2021/17-P), Santiago, 2022.

Note: Latin America and the Caribbean includes Argentina, the Bahamas, Belize, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, the Plurinational State of Bolivia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago and Uruguay. The study by Burke, Hsiang and Miguel (2015) also includes Jamaica, while that by ECLAC (2022) also includes Antigua and Barbuda, Barbados, Dominica, Grenada, Saint Kitts and Nevis and Saint Lucia.

An additional finding is that a permanent temperature increase may generate a permanent loss if adaptation to a new climate regime has been limited or non-existent (Kalkuhl and Wenz, 2020; Burke and Tanutama, 2019; Dell, Jones and Olken, 2012). Adaptation may be more complicated than anticipated (Burke, Hsiang and Miguel, 2015); the strongest constraints on adaptation are observed in small island developing States (SIDS), Central America and South America (IPCC, 2022a).

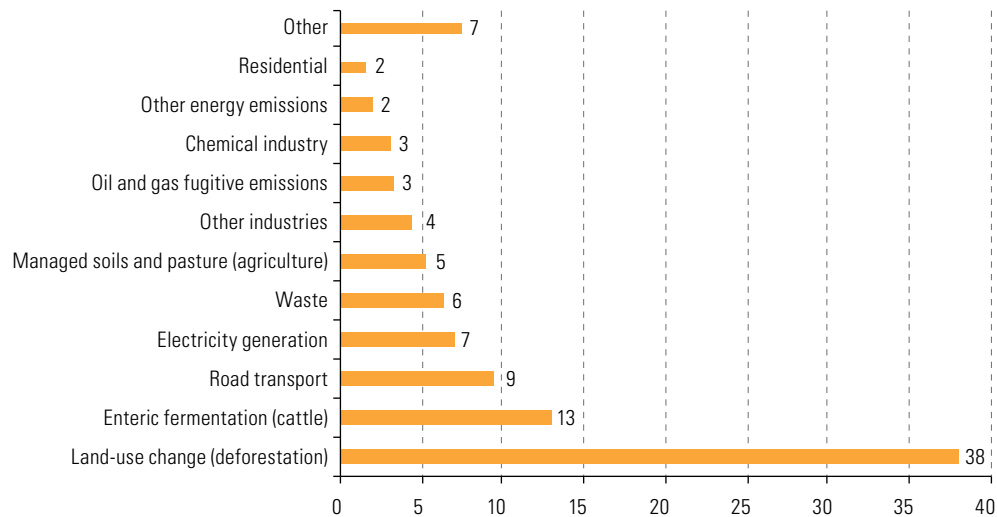
Between 2020 and 2022, Latin America and the Caribbean set itself major targets for scaling up emission reduction commitments: 25 countries have already updated their national pledges for combating climate change. The new unconditional pledges for 2030 target a 22% reduction in emissions compared to the baseline scenario, up from the 13% announced in 2015 (Samaniego and others, 2019). Conditional nationally determined contributions, i.e., those contingent on aspects such as finance, technology transfer and climate action by other countries, offer a reduction of 28%, 5 percentage points higher than the 23% originally announced.

Structural change can contribute to the fulfilment of these commitments. It is possible to break down emissions by the activities that generate them. After deforestation, livestock is the largest emitter in the region, accounting for 13% of total emissions, followed by road transport, which is fossil energy-intensive, and electricity generation (see figure II.11).

Analysis of the region’s emissions indicates that their main sources are in primary activities. In contrast, the largest emitting sector in the rest of the world is the energy sector, which points to a specificity of Latin America and the Caribbean where the pattern of emissions is concerned. The discussion on structural change should aim at changing production processes in the primary and land-use sectors, whilst increasing the GDP share of less polluting manufacturing and services.

Figure II.11

Latin America and the Caribbean: shares of total emissions, by activity, 2019
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from J. C. Minx and others, "A comprehensive and synthetic dataset for global, regional, and national greenhouse gas emissions by sector 1970–2018 with an extension to 2019", *Earth System Science Data*, vol. 13, No. 11, Copernicus Publications, 10 November 2021.

An econometric exercise for Latin America and the Caribbean (see table II.3), in which greenhouse gas (GHG) emissions are the dependent variable, shows a negative association between these emissions and the share of manufacturing in GDP: as the share of manufacturing in the economy increases, GHG emissions decrease. This is partly explained by a reduction in the share of primary activities, which are more emissions-intensive per unit of value added than manufacturing. This relationship is not linear; the emissions reduction effect increases as the manufacturing share approaches a certain threshold (27% of GDP for the first specification and 19% for the second). Once this threshold is exceeded, the effect of industrialization on emissions reductions declines. GDP, GDP squared, total population and urban population were used as control variables in the regression.

At the same time, there is evidence that increased economic complexity is closely related to reductions in GHG emissions intensity and in per capita GHG emissions (Romero and Gramkow, 2021). This relationship is due, first, to the increased share in the economy of manufacturing, which is less emissions-intensive. Second, it is also due to the fact that low-carbon innovations, technologies, practices and solutions necessarily entail an increase in the amount of knowledge embedded in the production structure of an economy, which is part and parcel of economic complexity. Going by data from 67 countries for the period 1976–2012, the results suggest that an increase of 0.1 in the economic complexity index generates a 2% decrease in emissions expressed in kilotons of carbon dioxide equivalent (CO₂e) per US\$ 1 billion of output, as well as in per capita CO₂e emissions. In other words, structural change not only makes it possible to move towards segments with higher economic value, but also to reduce the pollution emitted per unit of economic value.

Figure II.12 shows the negative relationship between the economic complexity index and GHG emissions intensity for 133 countries: the greater the economic complexity of the country, the lower the intensity of GHG emissions. There are two main reasons for this. First, complex goods tend to be technologically sophisticated products with high market values. This generates economic efficiency, in the sense that more economic value is obtained for each unit of GHG emitted. In addition, complex economies are more likely to develop capabilities that can help reduce emissions and produce goods more efficiently, for example, through the development of eco-innovations.

Table II.3

Latin America and the Caribbean (16 countries): non-linear relationship between industrialization and emissions, 1970–2019

	Specification 1	Specification 2	Specification 3
Population	0.96745*** (0.02415)	1.18089*** (0.11750)	1.16158*** (0.11699)
Per capita GDP	1.54678*** (0.33580)	1.60345*** (0.31300)	1.56405*** (0.32651)
Per capita GDP squared	-0.07487*** (0.01957)	-0.07746*** (0.01811)	-0.07642*** (0.01901)
Manufacturing value added/GDP	-0.01179** (0.00390)		-0.01361*** (0.00379)
Manufacturing value added/GDP squared	0.00022* (0.00010)		0.00038*** (0.00010)
Urban population		-1.30559*** (0.17016)	-1.50107*** (0.18944)
Urban population squared		0.02931*** (0.00438)	0.03484*** (0.00486)
R-squared	0.88761	0.89387	0.89602
Adjusted R-squared	0.88472	0.89115	0.89308
Observations	800	800	800

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Note: The countries included are Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Panama, Paraguay and the Plurinational State of Bolivia. The model was estimated with panel data using the fixed effects method, with greenhouse gas emissions as the dependent variable. Standard errors in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Figure II.12

Economic complexity index and greenhouse gas (GHG) emissions intensity, 2015–2018 average



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, "World Development Indicators" [online database] <https://databank.worldbank.org/source/world-development-indicators> [accessed on 23 June 2022]; and Growth Lab at Harvard University, "The Atlas of Economic Complexity" [online database] <https://atlas.cid.harvard.edu> [accessed on 23 June 2022].

Analysing the characteristics of 772 products and 165 countries reveals that the products with the highest technology content and the greatest capacity to disseminate technical progress are also those with the lowest emission intensity index values. The same conclusion is obtained by grouping the sectors according to Pavitt's (1984) classification, which, as discussed earlier, provides an approximation to the Schumpeterian efficiency of the specialization pattern.

Table II.4 shows that the most emission-intensive products are those characterized by natural resources. The least GHG-intensive products belong to the specialized suppliers sector and the science-based sector. In fact, if we look at the 25 most and least emission-intensive products, it can be seen that the most emission-intensive ones are dominated by natural resources, while the least emission-intensive ones are dominated by science-based products.

Table II.4

Emissions by product type, grouped according to Pavitt's classification, 2015–2018 averages
(Kilo tons of CO₂ eq per billion dollars at 2015 prices)

Sector	Average PEII	Median PEII
Natural resources	1 522	1 309
Supplier-dominated	1 104	895
Scale-intensive	880	811
Specialized suppliers	935	796
Science-based	706	583

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of K. Pavitt, "Sectoral patterns of technical change: towards a taxonomy and a theory", *Research Policy*, vol. 13, No. 6, December 1984 (for the classification of goods).

Note: The product emission intensity index (PEII) is the weighted average of the greenhouse gas emissions of countries that have a comparative advantage in that product as measured by the revealed comparative advantage index (RCAI), using the product's share of the country's total exports as the weight. This index assumes that high-emitting products are those produced and exported by high-emitting countries. The calculation formula is as follows: $PEII_p = \frac{1}{N_p} \sum_c M_{cp} S_{cp} EI_{cp}$, where p is the product, c is the country, EI_c are the country's average emissions in the period of analysis, M_{cp} is 1 if the country has a revealed comparative advantage in that product, S_{cp} is the share of p in the total exports of c , and $N_p = \sum_c S_{cp}$ is a standardization factor. The goods classification is based on Pavitt (1984).

Where the small open economies of the Caribbean are concerned, the various shocks affecting the global economy have manifested themselves in increased debt burdens, the environmental impact of climate change, the detrimental effects of non-communicable diseases, and the COVID-19 pandemic. As in the rest of the hemisphere, these shocks have also given rise to greater social challenges, aggravated by the fact that the Caribbean economies are among the world's most indebted.

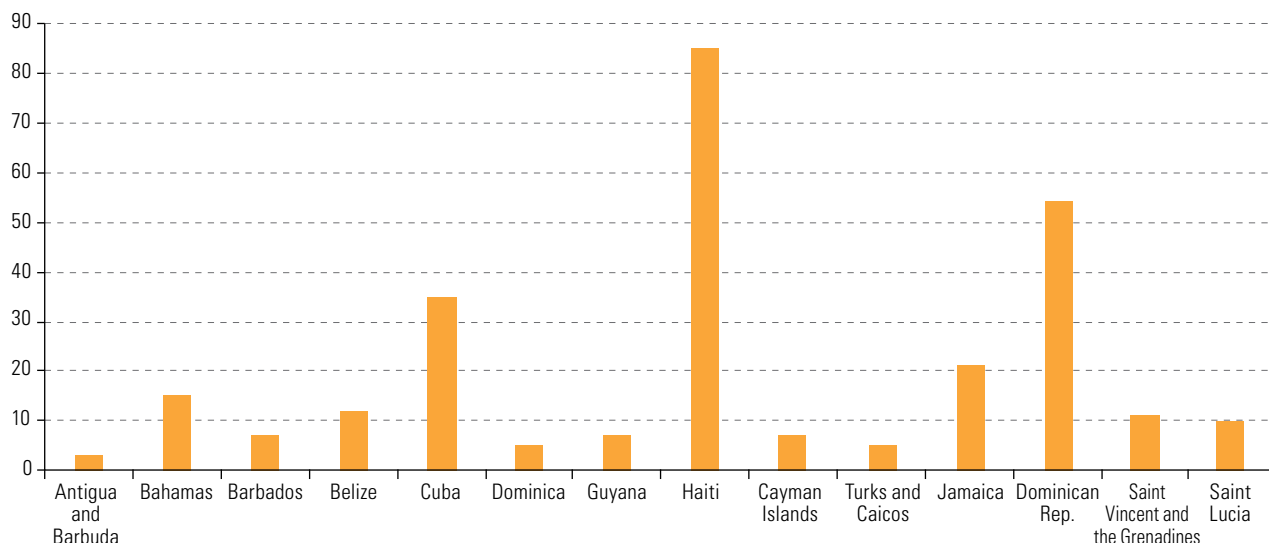
9. The Caribbean: a region heavily exposed to the impacts of climate change

The Caribbean is particularly vulnerable environmentally, and as climate change with its shifting consequences has evolved, disasters have become increasingly severe. As ECLAC (2021) points out, the Caribbean experienced no fewer than 326 disasters related to natural hazards during the period 2000–2021 (see figure II.13). Three of the most powerful hurricanes (Irma, Maria and Dorian) caused substantial devastation in 10 Caribbean economies between 2017 and 2019. Ötker and Srinivasan (2018) also estimate that the average damage per disaster as a share of GDP is 4.5 times as high in the subregion as in larger countries.

Figure II.13

The Caribbean (selected countries and territories): natural disasters, 2000–2021

(Number of disasters)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Disasters and inequality in a protracted crisis: towards universal, comprehensive, resilient and sustainable social protection systems in Latin America and the Caribbean* (LC/CDS.4/3), Santiago, 2021.

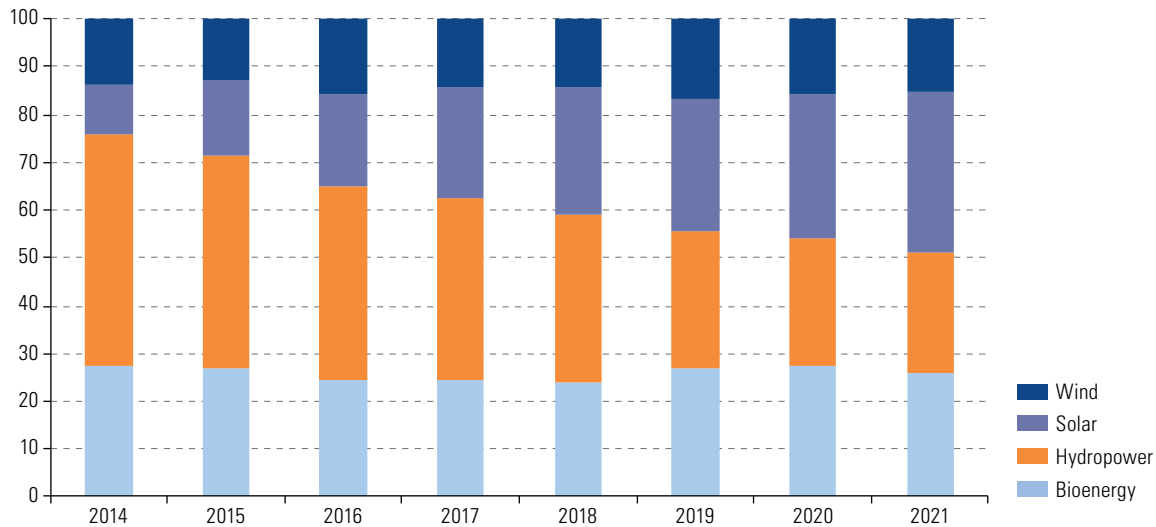
However, the last decade has also seen other climate-induced environmental impacts, including coral bleaching, an increased incidence of sargassum seaweed and rising sea levels, as ocean temperatures rise. All of these pose enormous economic threats to small Caribbean territories, given the subregion's heavy reliance on environmental and coastal resources and services to sustain its economies, based as they are primarily on tourism and agriculture. Moreover, these risks are exacerbated by the fact that most built infrastructure is situated on the coasts of the islands.

For the Caribbean subregion, technological progress in the energy sector provides the most significant industrial policy response to the prevailing environmental and geopolitical crises. With the exception of Trinidad and Tobago, and recently Guyana, the Caribbean remains heavily dependent on imported fossil fuels to sustain its economic and social activities. According to Guerra (2016), during the last decade fossil fuels accounted for as much as 63.4% of the subregional energy mix. Owing to this heavy reliance on imported energy, the subregion is extremely vulnerable to global energy prices and supply shocks.

Faced with the environmental and political imperatives of climate change and the constant disruptions resulting from the subregion's natural vulnerability, however, a number of Caribbean economies have made great strides in adopting renewable energy, both as a strategy to meet their obligations under the Paris Agreement and to reduce their dependence on imported fossil fuels. IRENA (2022) reports that Caribbean SIDS have increased their total installed renewable energy capacity by 49.6% since 2014. This increase accelerated between 2018 and 2021, despite severe natural disasters and the COVID-19 pandemic, when the use of solar energy, bioenergy and hydropower increased by 34%, 26% and 25%, respectively (see figure II.14). Much of this growth has been led by Antigua and Barbuda, Aruba, Barbados, the Dominican Republic, Jamaica, Saint Kitts and Nevis and Saint Lucia. The Cayman Islands, Dominica and Saint Vincent and the Grenadines have also made major efforts to commission renewable marine and geothermal energy sources.

Figure II.14

The Caribbean: share of total installed renewable energy capacity, by technology
(Percentages)



Source: International Renewable Energy Agency (IRENA), "Progress data", Small Island Developing States Lighthouses Initiative, 2021 [online] <https://islands.irena.org/RE-Progress/Progress-Data>.

B. There are no growth miracles, but long-term policies can redirect incentives to the most dynamic sectors

Countries' initial endowment of factors of production can be a major determinant of their development paths, but it is not an inescapable destiny. While there are many factors that affect development paths, this section highlights the three considered most important. The first is that macroeconomic policies, even those focused on the short term, affect productive transformation and help determine long-run trajectories. There is a relationship between the short term and the long term that materializes in investment decisions and makes the "natural" growth rate endogenous to policies. Second, financial openness and greater integration into global markets have made investment more unstable; public and corporate debt have increasingly had the effect of depressing the investment rate. Third, industrial and technology policies are crucial in shaping the incentive structure and hence the sectoral composition of investment. These policies require a strategic review of how new capabilities can be built on existing ones and how low output and productivity growth traps can be overcome.

1. Debt and investment: a more unstable global economy with less resilient national economies

Capital accumulation depends on firms' profitability expectations, which in turn are closely related to: (a) expectations about the future behaviour of aggregate demand and (b) the incentives provided by industrial and technology policy to promote certain sectors. An economy entering a recessionary phase will see its investment rate fall as the expected returns on new investment deteriorate, and this has effects beyond the short term. Aghion and Kharroubi (2008) show that countercyclical policies which reduce the volatility of growth have favourable effects on the long-run growth rate.

Since the external debt crisis (1980–1983), which inaugurated the “lost decade” (1980–1990), Latin America and the Caribbean has experienced a decline in the trend rate of growth in regional per capita (GDP). The region went into a state of virtual economic stagnation following the implementation of policies associated with the Washington Consensus. An analysis of the trend growth rate of regional per capita GDP for the period 1980–2019 shows it falling from 2.4% in 1980–1990 to 1.9% in 1990–2000, before converging on 1.8% for the rest of the period. The short- and longer-term impact of the pandemic, the rebound in 2021 and the combined effects of the war in Ukraine and rising international interest rates have reinforced the declining trend.

The sustained loss of economic dynamism has also been accompanied by greater volatility of growth. Increasing external financial openness and more flexible prices and exchange-rate regimes have combined with greater reliance on short-term flows to leave the region more exposed to the vagaries of international credit and capital markets. A feature of the cycle in the region is that its downturn phases are of similar average duration and intensity to those of other regions. The difference is that Latin America and the Caribbean cannot sustain the upturns of the business cycle, which are less vigorous than in other regions, particularly East Asia and the Pacific. Even the commodity supercycle of 2002–2007, during which the region recorded its highest GDP growth rate in more than four decades, had a temporary effect on growth without reversing its downward trend.

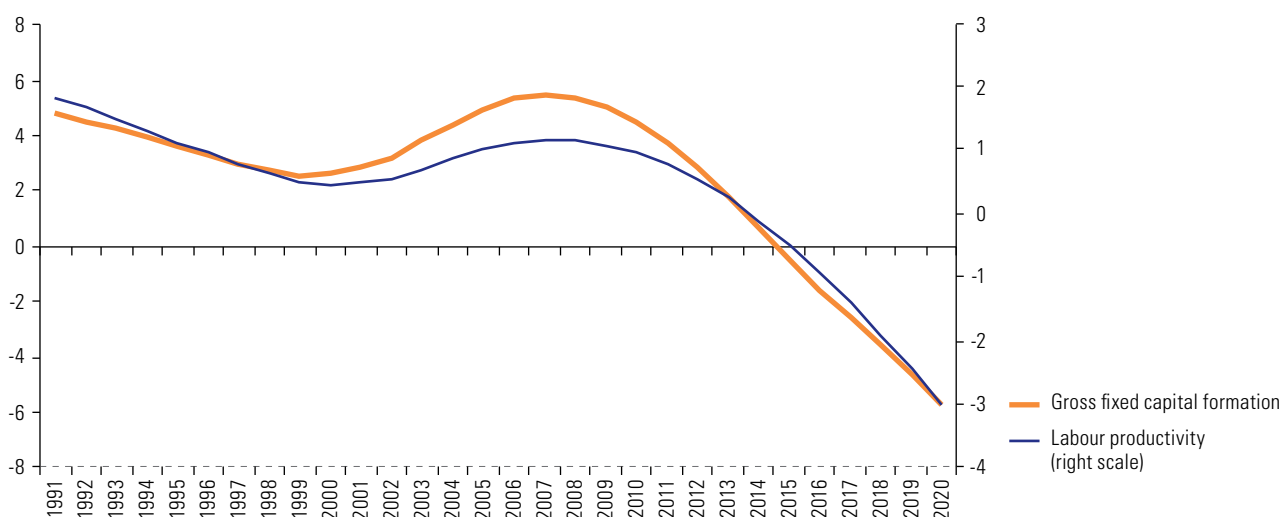
This per capita GDP trajectory is associated with trends in the two most dynamic components of aggregate demand: gross fixed capital formation and exports of goods and services. The average trend growth rate of gross fixed capital formation declined from 3.5% in the period 1991–2000 to 0.46% in the period 2010–2020. Similarly, the rate of change in exports of goods and services fell from 6.1% to 5.2% in the same periods.

The weak performance of gross fixed capital formation has an impact on capital accumulation and thence on the evolution of productivity. In the case of Latin America and the Caribbean, the rate of change in productivity has been trending downward, along with investment (see figure II.15). The growth rate of labour productivity declined from 1.1% for the period 1991–2000 to -0.69% for the period 2010–2020.

Figure II.15

Latin America and the Caribbean: trend rates of change in labour productivity and gross fixed capital formation, 1991–2020

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, World Development Indicators, 2021 [online] <https://databank.worldbank.org/source/world-development-indicators>.

Note: The trend rate of change was obtained by applying the Hodrick-Prescott filter to the respective time series of labour productivity and gross fixed capital formation.

The behaviour of investment can be explained by the interaction of real and financial factors. Regarding real factors, Latin American economies failed to diversify and improve their production and export structure during the period of opening and liberalization, and this affected the long-term growth rate. The impact of COVID-19 was strongest in Latin America and the Caribbean, largely because of its weak production base, as will be discussed below.

The constraints in the real economy have been compounded, especially since the global financial crisis of 2008–2009, by those stemming from indebtedness, which affects both governments and the non-financial corporate sector. Although borrowing has risen in all developing regions, the situation is particularly serious in Latin America and the Caribbean, since it is the region with the highest external debt service as a percentage of its goods and services exports (see table II.5). The region also contains the largest number of countries with a ratio of general government public debt to GDP in excess of 100% (26% of the total), most of them in the Caribbean.

Table II.5

Emerging and developing world (selected regions): external debt indicators, 2019–2021
(Percentages)

Region	External debt as a share of goods and services exports			External debt as a share of GDP			External debt service as a share of goods and services exports		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Emerging and developing economies	116.6	137.0	111.8	30.5	32.6	30.7	42.1	38.7	35.4
Emerging and developing Asia	86.0	97.5	83.2	18.8	19.7	19.3	47.2	50.2	43.6
Emerging and developing Europe	120.9	142.2	110.9	46.8	52.3	51.9	42.5	49.2	38.3
Latin America and the Caribbean	192.6	224.7	182.6	47.9	55.5	51.8	50.9	59.5	41.7
Middle East and Central Asia	125.0	177.7	137.2	46.8	51.8	42.4	22.2	30.0	20.6
Sub-Saharan Africa	172.5	215.3	171.1	42.6	43.9	41.1	28.5	32.8	29.5

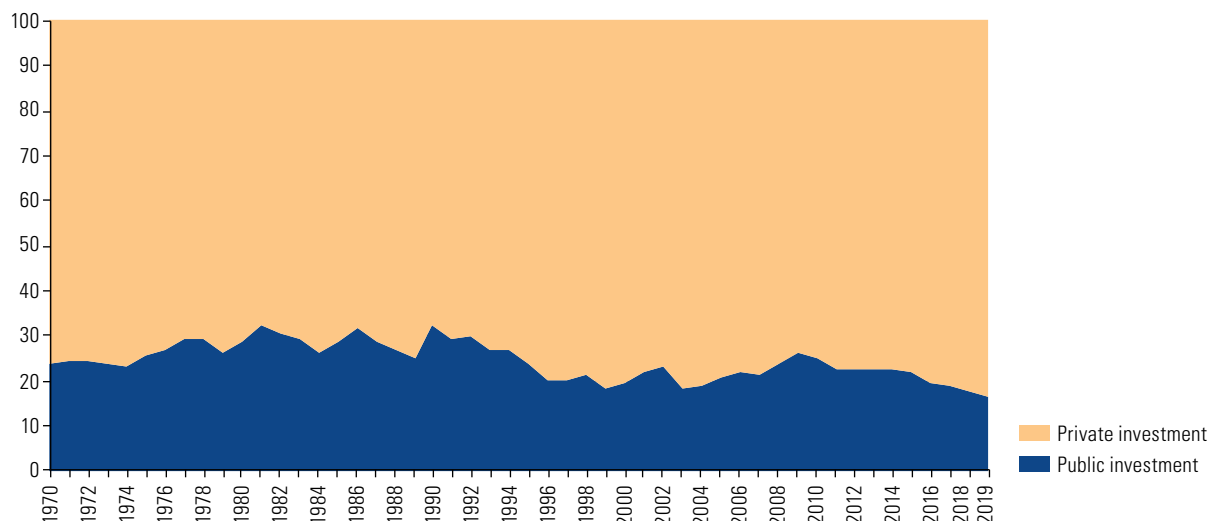
Source: International Monetary Fund (IMF), “World Economic Outlook Databases” [online] <https://www.imf.org/en/Publications/SPROLLS/world-economic-outlook-databases#sort=%40imfdate%20descending>.

Note: Given that most countries experienced an economic contraction in 2020, the external debt to GDP indicator may overestimate the increase in debt.

The debt burden, coupled with the scale of tax evasion and avoidance in Latin America and the Caribbean, limits public sector investment capacity in the region. Public investment has systematically fallen as a percentage of total investment, which, as mentioned, has been on a declining trend (see figure II.16). This reveals the growing inability of the public sector to act as a catalyst for private investment.

Figure II.16

Latin America and the Caribbean: public and private investment as shares of the total, 1970–2019
(Percentages)



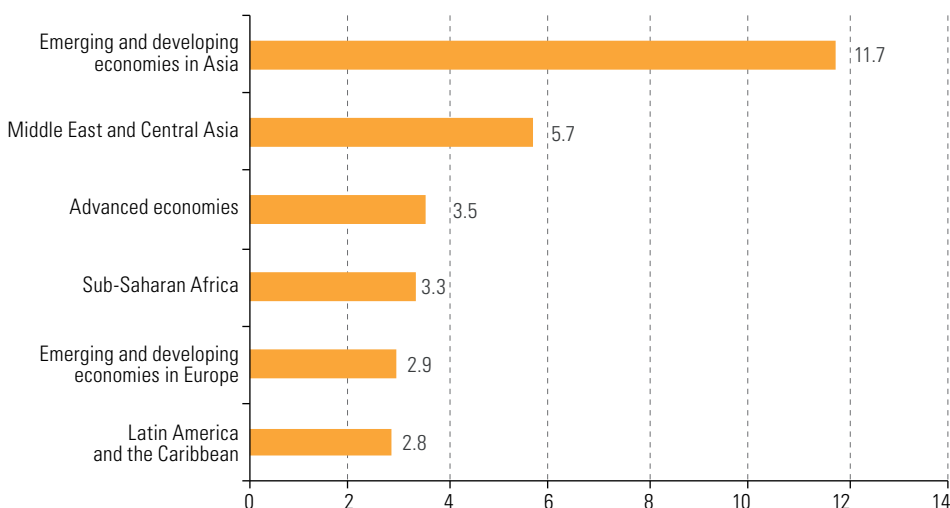
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and International Monetary Fund (IMF), “Investment and Capital Stock Dataset (ICSD)” 2021 [online] <https://data.imf.org/?sk=1CE8A55F-CFA7-4BC0-BCE2-256EE65AC0E4>.

In 2019, the weighted average of general government gross fixed capital formation in the region was 2.8% of GDP, which contrasts strongly with the values observed in advanced economies and emerging and developing Asia (see figure II.17A). The regional performance largely reflects the limited general government gross fixed capital formation of the largest economies, notably Brazil (2.2% of GDP) and Mexico (2.2% of GDP). The region's low level of public investment is evident when it is compared with emerging and developing Asia (weighted average of 11.7% of GDP), driven by the dynamism of China, which devoted 17.3% of GDP to public investment in 2019.

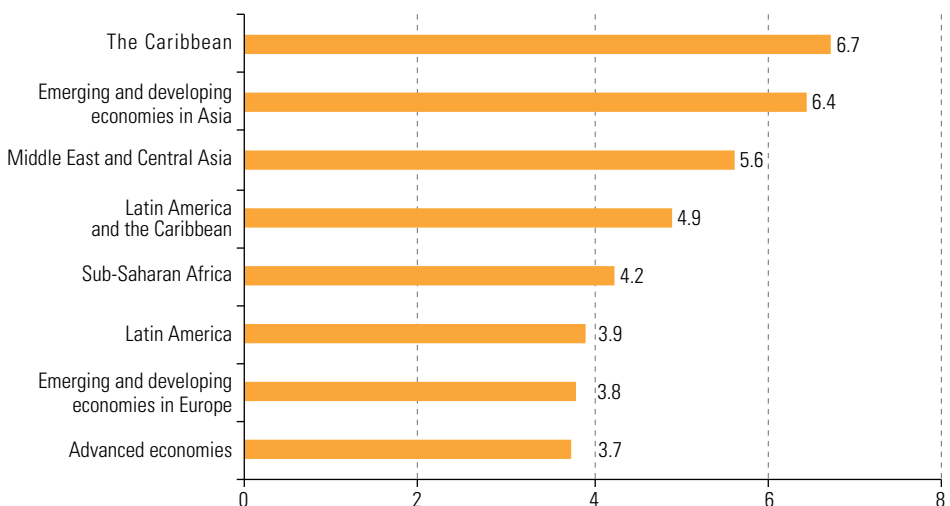
Figure II.17

Selected groupings and regions: general government gross fixed capital formation, 2019
(Percentages of GDP on a constant price basis)

A. Weighted averages



B. Simple averages



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Monetary Fund (IMF), "Investment and Capital Stock Dataset" [online] <https://data.imf.org/?sk=1CE8A55F-CFA7-4BC0-BCE2-256EE65AC0E4>.

Note: The weighted averages are calculated on the basis of purchasing power parity GDP in international dollars at current prices.

The situation in the region looks better when simple averages are taken, although public investment remains limited (see figure II.17.B). However, it is important to note that the regional result is largely due to the higher levels of public investment in the Caribbean (6.7% of GDP). Public investment in Latin America (3.9% of GDP)

is slightly above the average in the advanced economies and well below the values in emerging and developing Asia. In sum, the low level of public investment in the region's countries limits their chances of converging with the advanced economies in terms of public capital stock or closing current structural development gaps. The contrast with emerging and developing economies in Asia, where high levels of public investment have helped to narrow infrastructure gaps over time, is instructive in this regard.

The sectoral breakdown of external debt, based on an analysis of bond issuance in international capital markets, indicates that general government is the largest issuer, accounting for an average of 65% of the total stock of Latin American and Caribbean debt securities between 1990 and the first quarter of 2021. However, the share of general government debt securities has decreased over time, from 88.4% of the total in 1990 to 50.8% in the first quarter of 2021. Meanwhile, the non-financial corporate sector, the second-largest debt issuer in the region, has increased its stock of debt securities both in volume (from US\$ 4 million to US\$ 337 million between 1990 and 2021) and as a share of the total (from 6% to 36% between the same years). Moreover, non-financial corporate debt has increased faster than any other sector's debt since the global financial crisis of 2008–2009.

Intensive use of the international bond market has not translated into higher investment. In the case of the non-financial corporate sector, the increase in external debt has actually gone along with a deterioration of its financial position. A study using a sample of 5,469 listed companies from six Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico and Peru) and covering 34 sectors of economic activity for the period 2009–2016 shows that a high proportion of companies are in a weak financial position, and that this proportion is even higher for companies issuing in the international bond market (Pérez Caldentey, Favreau Negront and Méndez Lobos, 2019; Abeles and Pérez Caldentey, 2022; Budnevich Portales, Favreau Negront and Pérez Caldentey, 2021). Financial weakness means a situation in which growing indebtedness generates ever-increasing debt repayment commitments which will eventually outstrip revenue streams. One indicator that can reflect the degree of financial weakness is the interest coverage ratio (i.e. earnings before interest payments and taxes divided by interest costs). According to a sample of 23,820 firms in selected Latin American countries in 2020, more than a quarter of these firms had an interest coverage ratio of 1 or less, and 37% of the debt of these firms had an associated interest coverage ratio of 1 or less (Taliervo, 2021).

Deteriorating financial conditions in the non-financial corporate sector can have major macroeconomic repercussions involving debt and changes in external financial conditions. The effects can be very severe for companies that issue bonds on the international market, as they account for a large share of total corporate assets, both in the economy as a whole and by sector of economic activity. Companies that issue bonds on international capital markets account for an average of 33.9% of total assets, 35.0% of expenditure on short-term investment and 40.8% of total expenditure on fixed assets and long-term investments. These results are the averages for Argentina, Brazil, Chile, Colombia, Mexico and Peru.

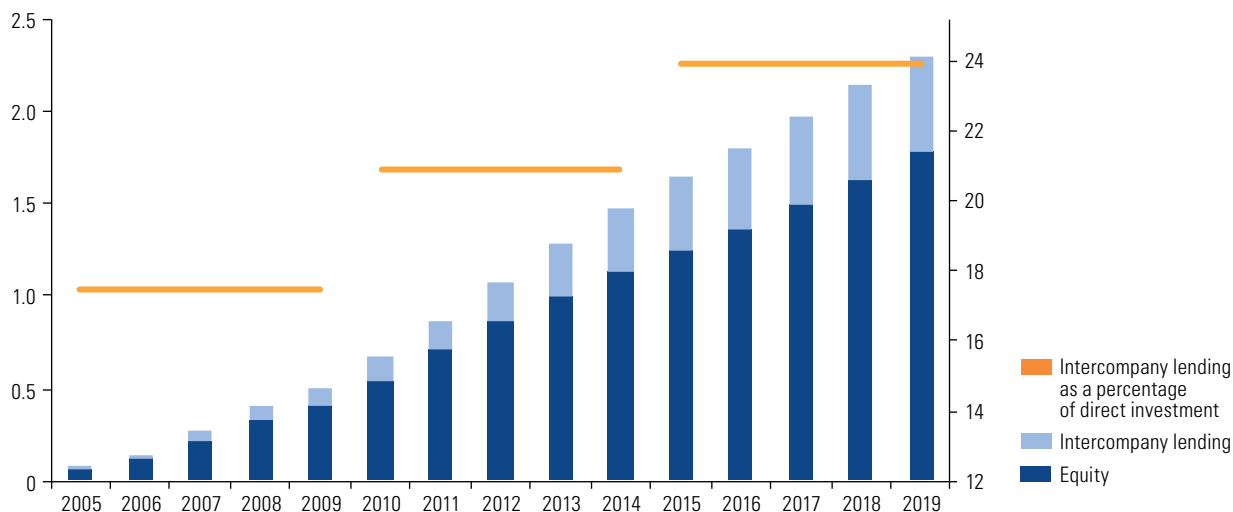
Another possible use of the bond market which demonstrates that this mechanism has not been employed to expand production capacity or to improve productivity, but rather for financial purposes, is the increase in intercompany lending that has occurred especially since the global financial crisis of 2008–2009. Between 2001–2009 and 2010–2019, inter-company lending increased by a factor of 25.7 in Colombia, 18.8 in Chile, 10.4 in Peru, 3.2 in Brazil, 1.5 in Argentina and 1.3 in Mexico. The substantial increase in the value of intercompany loans has been accompanied by an increase in their share of total FDI flows. At the regional level, inter-company loans accounted for about 18% of FDI in 2005–2008, rising to 22% in 2010–2014 and to 24% of equity flows in the same period (De Camino, Pérez Caldentey and Vera, 2022).

Intercompany lending is a way to obtain liquidity in international financial markets and repatriate these funds in order to invest them in financial assets or simply use them for domestic lending to other economic agents. Thus, firms in the productive sector end up becoming financial intermediaries through the financial use of intercompany loans (Avdjiev, Chui and Shin, 2014).

The share of intercompany lending in FDI flows to Latin American economies has increased (from 18% in 2005–2008 to 22% in 2010–2014 and 24% in 2015–2019) (see figure II.18). This raises potential instability concerns, as these flows are mainly driven by a short-term logic. Indeed, Avdjiev, Chui and Shin (2014, p. 71) argue that intercompany lending can be viewed as “portfolio flows masked as FDI”.

Figure II.18

Latin America (18 countries): cumulative inward foreign direct investment flows, equity and intercompany lending
(Billions of dollars and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of balance-of-payments statistics from the International Monetary Fund (IMF).

2. Macroeconomic policy, competitiveness and premature deindustrialization

Since the pioneering studies by Nicholas Kaldor, manufacturing has received special attention in the growth literature on the grounds that it has three important characteristics which explain growth: it produces increasing returns through static and dynamic economies of scale (the more manufacturing output grows, the higher the sector's productivity growth is); it diffuses technical progress not only internally but to other sectors of the economy (e.g. through capital goods), making it a driver of growth; and it absorbs informal sector employment and underemployment into more productive and higher-paying jobs. It has already been noted that some manufacturing branches are also more dynamic in terms of demand than natural resource-intensive goods. In sum, it is a sector with rapid productivity growth that creates jobs with above-average productivity and generates externalities that stimulate the productivity of the economic system as a whole.⁸

In many advanced economies, manufacturing has lost share in employment and GDP to modern services. In principle, there is nothing wrong with manufacturing giving way to services as economies reach higher levels of per capita income. However, what is being seen in Latin America and the Caribbean is what some authors call "premature deindustrialization," a reduction in the employment and GDP share of manufacturing occurring at much lower levels of per capita income than in the developed world. Premature deindustrialization can be measured by the manufacturing gap and the manufacturing employment gap.

The manufacturing gap is defined as the difference between the actual share of manufacturing in a country's value added at a given time and the potential share that it should have given the country's per capita income level. The latter share is estimated using Rodrik's (2016) methodology, which consists of a regression between the manufacturing share of GDP as the dependent variable and per capita income, per capita income squared and other control variables⁹ as explanatory variables. This regression is estimated for a sample of

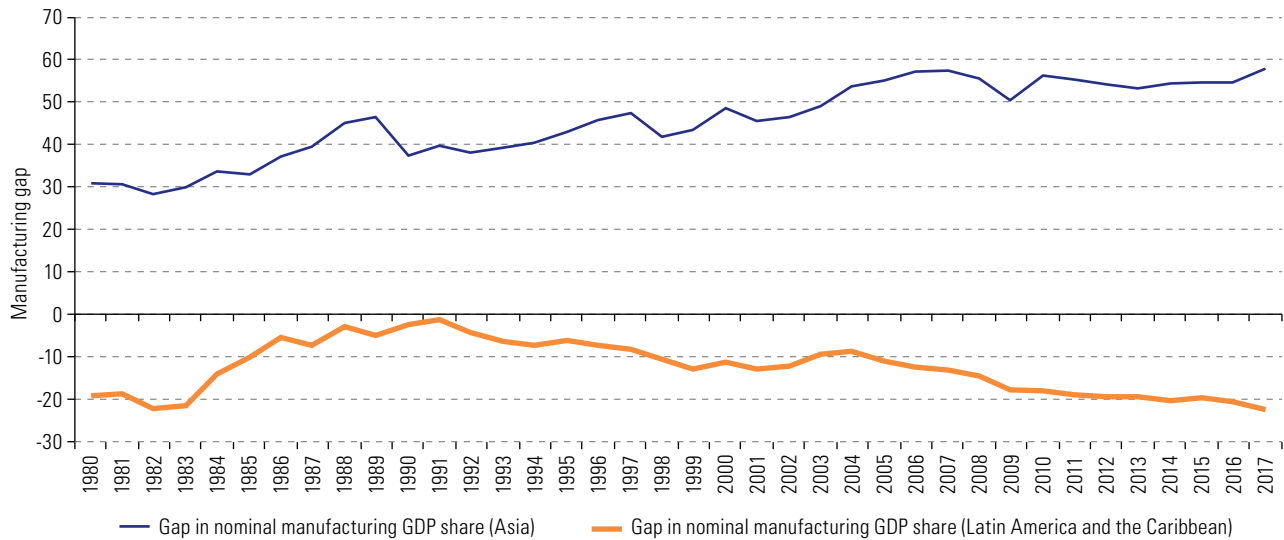
⁸ The above points are variations of Kaldor's (1996) three laws of growth, summarized in Thirlwall (1983): (a) GDP growth follows manufacturing growth; (b) productivity growth in manufacturing is driven by growth in manufacturing itself; (c) productivity growth in the non-manufacturing sector is driven by productivity growth in manufacturing.

⁹ The other control variables in the regression to estimate the average manufacturing share of value added (or manufacturing share of total employment) include the degree of economic openness as measured by the share of exports and imports in GDP, population, the growth of the rest of the world and the GDP share of natural resource rents.

36 countries, developed and developing. The manufacturing employment gap is measured in the same way as the manufacturing value added gap, but using in this case the manufacturing share of total employment as the dependent variable. Premature deindustrialization, captured by the size of both the manufacturing gap and the manufacturing employment gap, indicates early losses of capabilities in tradable goods sectors that affect the path of structural change (see figures II.19 and II.20).

Figure II.19

Latin America and the Caribbean and Asia (36 countries and territories): gaps in the manufacturing share of GDP, 1980–2017
(Percentages of expected values)

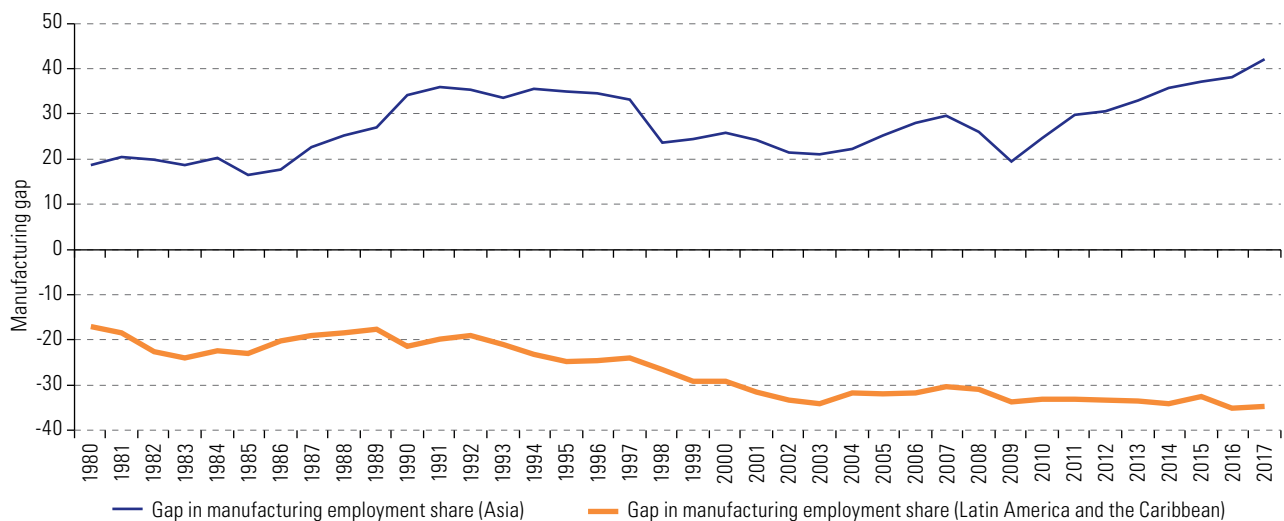


Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Note: The Asian countries and territories included are the Republic of Korea, Singapore and Taiwan Province of China.

Figure II.20

Latin America and the Caribbean and Asia (36 countries and territories): gaps in the manufacturing share of total employment, 1980–2017
(Percentages of expected values)



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Note: The Asian countries and territories included are the Republic of Korea, Singapore and Taiwan Province of China.

The question arises as to why there are such disparate trends in the industrial share of GDP in Latin America and the Caribbean and in Asia. The answer lies in differences in macroeconomic policy (and more specifically the way economies participate in the international financial system) and industrial policy.

Where macroeconomic policy is concerned, the Latin American and Caribbean countries have kept their capital accounts open and allowed their real exchange rates to appreciate strongly during periods of high international financing liquidity, especially since the 1990s, while the Asian countries have kept their capital accounts more closed and defended the competitiveness of their industries. The real exchange rate has been more stable and competitive in Asia. Latin American and Caribbean countries, by contrast, have chosen the side of the macroeconomic trilemma that exacerbates exchange-rate volatility and allows long periods of appreciation.

Premature deindustrialization is aggravated by the impact of short-term capital flows when the capital account is open. These flows are procyclical and thus reinforce imbalances in the external sector. At times of abundant liquidity, capital is attracted by higher interest rates in the periphery than in the international economy, which contributes to currency appreciation and expansion of the domestic economy; however, when these conditions change, capital leaves the periphery in search of safe reserve assets in the centres. Instability becomes more acute, as does the frequency and intensity of crises. Exchange-rate appreciation compromises the expansion and diversification of tradable goods sectors, especially manufacturing, into branches that are less dependent on natural resource advantages.

The financial liberalization processes observed since the mid-1970s, but especially since the 1990s, have exacerbated the negative effects of the main macroeconomic prices (exchange rate and interest rate) on tradable goods. Botta, Yajima and Porcile (2021) tested the hypothesis that short-term capital flows have a negative impact on the manufacturing share of both value added and employment. The exercise conducted by these authors sets out from Rodrik's (2016) regression and includes a dummy variable for periods of strong speculative capital inflows.¹⁰ The regression results are presented in table II.6.

Table II.6

World, developing economies and developed economies: manufacturing shares of total employment and periods of high international liquidity

Variable	(1)	(2)	(3)
	All countries	Developing economies	Developed economies
Per capita GDP	0.000616*** (5.29e-05)	0.000876*** (6.51e-05)	-0.000641*** (8.92e-05)
Per capita GDP squared	-1.00e-08*** (1.09e-09)	-2.01e-08*** (1.81e-09)	4.40e-09*** (1.17e-09)
Population	-4.82e-06* (2.46e-06)	3.37e-07 (2.65e-06)	2.43e-05*** (8.24e-06)
Population squared	0*** (0)	0 (0)	-9.43e-11*** (0)
Financial boom dummy variable	-0.253** (0.114)	-0.235* (0.122)	-0.0667 (0.184)
Trade openness	0.00657* (0.00366)	0.00381 (0.00490)	0.0166*** (0.00305)
Rest of the world GDP growth rate	0.00126 (0.0102)	0.00121 (0.00873)	0.00226 (0.00917)
Total natural resource rent (as a percentage of GDP)	-0.0183 (0.0186)	-0.00124 (0.0197)	-0.000676 (0.189)
Constant	8.218*** (0.566)	6.430*** (0.475)	31.92*** (1.706)
Observations	896	647	249
R-squared	0.789	0.763	0.941

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

¹⁰ Two criteria were used to define these periods of high liquidity: (a) net equity income is never negative and is positive for at least three consecutive years; (b) average income is greater than the average of all periods plus an increase equal to 10% of a standard deviation.

A similar exercise carried out by these authors using the economic complexity index instead of the share of manufacturing as the dependent variable confirms the negative impact of cycles of short-term capital inflows on the production structure. These capital inflows, which arbitrage between domestic and foreign interest rates, lead to a temporary appreciation of the real exchange rate. Their effects are similar to Dutch disease in that they reduce the competitiveness of the economy: the loss of tradable goods sectors is a regressive structural change in the sense that Schumpeterian efficiency and Keynesian efficiency tend to fall, with persistent effects on “potential growth” (or long-run growth with external equilibrium).

As a corollary, the exercise confirms the importance of implementing macroeconomic policies that sustain development and structural change. Countercyclical policies aimed at maintaining competitiveness and avoiding frequent fluctuations, external shocks and sharp exchange-rate appreciations are crucial to the process of structural transformation. Latin America and the Caribbean has pursued freedom in the capital account, while Asia has been concerned with basic equilibria. This relates to the need to maintain macroprudential policies as determinants of macro price paths compatible with Schumpeterian efficiency and Keynesian efficiency. Macroprudential policy should reduce exchange-rate instability, prevent phases of unsustainable borrowing and appreciation, and include countercyclical measures to sustain aggregate demand. But these are not the only policies that matter. Industrial and technology policy must orient investment towards sustainability and inclusiveness, as discussed in subsection 3.

3. Industrial and technology policy

When talking about industrial policy, it is important to make three points. First, although manufacturing industry, as already mentioned, has and will continue to have an important role to play in development policies, the concept of industrial policy encompasses all production sectors. In particular, it encompasses the processes of transformation of nature, energy production and services. Accordingly, what matters are the intrinsic characteristics and dynamics of each sector in terms of its contribution to technological change and productivity growth. Today, industrial policies cannot fail to have a very strong environmental policy component, and nor can they fail to focus on the profound transformations taking place in the modern services sector, led by transformations in the digital economy.

Second, in dealing with industrial policy, it is essential to set out from a systemic approach, which means bearing in mind the interactions and synergies between the very different components of a production system. Although industrial policies entail a strong emphasis on sectoral approaches and, in particular, on those sectors that have a great capacity to penetrate the productive fabric as a whole, this does not mean dispensing with demand policies of a horizontal type that are capable of ensuring the success of activities not considered important a priori and of making a significant impact. Both sectoral and horizontal policies require public capabilities to ensure their quality and sophistication.

Third, a systemic approach to industrial policies includes science and technology policies. It is clear that science policies cannot and should not be limited by industrial policy approaches, since science far transcends the direct demands and needs of the productive sector. Science contributes to the development of capabilities and knowledge with unimaginable applications and to the generation of cultural dynamics that are an end in themselves. However, to conceive of productive development without a central role for science is extremely short-sighted. It is just as short-sighted to expect science to reach the production fabric only through technology transfers, whether deliberate or tacit. This is not to gainsay the need for explicit technology transfer policies (catching-up) associated with systemic policies to complement the logics of Schumpeterian efficiency and Keynesian efficiency.

(a) The long-term characteristics of industrial policies in Latin America and the Caribbean

Latin America and the Caribbean has a long history of industrial policy. This policy has displayed the same characteristics as have been noted for economic dynamics generally: it has been highly volatile and fluctuating and has not been characterized by perseverance and long-term accumulation.

The State-led industrialization period was one of very important learning experiences and accumulation of State capacities for the development of industrial policies. Its successes and limitations have already been extensively analysed (Bértola and Ocampo, 2012; Cárdenas, Ocampo and Thorp, 2003). Industrial development progressed very unevenly across the region, being much more substantial in large and medium-sized countries and in small countries with relatively high per capita incomes.

Perhaps one of the most paradigmatic examples was Brazil, which built a very extensive network of policies and institutions to promote productive development (Suzigan, 1996; Suzigan and Villela, 1997), enabling Brazilian industry to significantly reduce the productivity gap with developed countries (Lara and Prado, 2018).

The industrial policies of the period had a strong bias towards the development of manufacturing, without neglecting support for that of the agricultural sector, which produces consumer goods and a wide range of inputs for manufacturing production.

Criticisms of these policies cited their indiscriminate support for the industrial sector, the lack of mechanisms to evaluate policy impact, their procyclical character because of the way their financing depended on favourable external sector conditions, their heavy subordination to the short-term dynamics of the effort to achieve balance-of-payments equilibrium in the face of recurrent crises in this field, and the strong tendency towards corporate capture of policies by both businesses and different social sectors involved with public policy and the domestic market.

The science and technology policies of the period were heavily dominated by the logic of the linear model, i.e. an effort to construct science and technology systems that were generally very disconnected from the requirements of the productive sector, although this did not mean that they failed to contribute to the development of strategic capabilities, especially when it was possible to combine State research efforts with those of public companies in strategic sectors (nuclear energy, armaments, transport and energy).

The crisis of State-led industrialization was due to internal and external factors that affected different countries of the region in different ways. The transition from a first phase of industrialization focused on the domestic market to one of export industrialization was drastic and early in some countries (such as Brazil and the more developed countries of the Southern Cone) and less drastic in others (Colombia, Peru, Mexico), until the debt crisis erupted.

The transition towards so-called structural reforms was shaped both by the State-led industrialization and foreign debt crisis and by a very pronounced shift in the international political and ideological climate towards pro-market reforms. From the point of view of industrial policies, there was a strong turn to the promotion of demand-side policies oriented towards business innovation. This meant the downgrading of sectoral policies, something that went along with the process of early deindustrialization and export reprimarization mentioned earlier, especially in the countries of the South.

This strong policy shift did not, however, mean the complete disappearance of sectoral policies, which persisted in certain sectors, superimposed on the new logic. A clear example is the protection that continued for the automotive complex in many countries, this being a sector that is clearly dominated by a relatively small number of multinational companies, but that is at the centre of a large network of auto parts suppliers.

This period saw the establishment of important regional integration agreements, under which some of the sectoral policies of the previous period were maintained and extended. These processes were quite successful in Central America, the Andean region and the Southern Common Market (MERCOSUR), although they did not provide a significant boost to the region's productive integration and were confined to specific subregions.

Science and technology policies were part of this process, being reoriented mainly towards the promotion of innovation through horizontal programmes aimed at meeting the demands of business, with very little sectoral orientation. Nevertheless, science funding policies retained some importance in certain countries, although they became increasingly disconnected from the productive sector, and investment in R&D remained very low compared to countries with higher levels of income and productive development.

In this context, trade liberalization and investment promotion policies burgeoned in many different formats, with a particular proliferation of free trade zone policies. Tax exemptions were the clearly predominant policy instrument.

(b) Characteristics of twenty-first century industrial policy in Latin America and the Caribbean

The twenty-first century began in the region amidst a new crisis in several Latin American countries. It was dominated by the so-called commodity supercycle (2005–2014), which culminated in a marked slowdown in growth, if not deep crises, even before the COVID-19 emergency broke out. A new long economic cycle has thus taken shape for the region, which has not yet found the path to sustained development (Bértola and Ocampo, 2022). As already seen, there was an important development in the middle of the supercycle with contrary effects, namely the international financial crisis of 2008, which was to have a strong impact on the performance and policies of some Latin American and Caribbean countries.

The crisis at the end of the century exposed the fragility of economic growth during the period of pro-market reforms. Export growth spilled over in only a very limited way to the rest of the economy, and the result was inadequate economic performance leading to a sharp increase in inequality and informality. Although poverty declined slightly, large sectors of the population were left vulnerable and quickly became poor as the crisis unfolded.

The beginning of the twenty-first century brought major political changes in the region, accompanied by a growing concern to combat poverty and inequality. In many countries, radical changes in political orientation brought left-wing or progressive governments to power.

It might be assumed that these changes in orientation would go together with a vigorous deployment of industrial policies embodying the old idea that far-reaching social transformations presupposed far-reaching changes in production structures that would provide a basis not only for increased productivity and growth, but also for alterations in power structures.

Owing to a number of factors, however, there was no strong revival of industrial policies, although the outcomes differed greatly by country and need to be looked at in a nuanced way. First, the view persisted internationally, especially in academia, that the best industrial policy was no industrial policy, that you could not pick winners, and that such policies created greater problems than the market failures they were meant to solve. It is true that a number of dissenting voices were now beginning to make themselves heard more forcefully. Second, the period of liberal reforms left the various States with greatly diminished capacities and in a very weak budgetary position. Moreover, as so often in the past, the fact that it coincided with the commodity supercycle raised the expectation that high and stable growth rates could be maintained without altering the production structure. Lastly, all these factors helped to strengthen the power of the groups that have traditionally managed production chains, which are linked to the control of natural resources.

The outbreak of the international financial crisis, however, led to major disruptions in the Latin American situation and compelled the adoption of measures to address the external imbalances caused by the crises in destination markets. The result was the return of certain defensive measures, some of which were reminiscent of the old protectionist policies and prevented regional integration processes from being carried forward.

Although national experiences differ greatly, some common features can be identified and will be exemplified below. As the century and the cycle began, major efforts were made to rebuild policy implementation capacities, something that was facilitated by the economic expansion and the easing of fiscal constraints. With varying levels of ambition, strategic sectoral policies began to re-emerge. The international financial crisis and its impact on the current account balance prompted the adoption of short-term, defensive policies. The growth slowdown associated with the commodity supercycle heightened contradictions and prompted policy measures that led to major course changes. Science and technology and industrial policies lack consistency and permanence, and a number of poorly connected geological layers of policies persist. This, in turn, is related to the absence

of a central role for industrial policy in the region's development strategies and the lack of leadership at the highest level in this area, which is manifested in the weakness of the science and technology system, its lack of connectedness with the productive system and the low budget allocations to both types of policies.

As will be seen below, this diagnosis contrasts with the policy environment in developed countries, which have taken energetic steps in the field of industrial and science and technology policy, especially since the 2008 financial crisis.

(c) A set of interventions classifiable as industrial policy has been pursued

In recent decades, there is practically no country in Latin America and the Caribbean that has not pursued production development policies. There has been a clearly identifiable set of interventions supported by an ad hoc institutional framework and policy instruments operating from different spheres, but with a very clear focus on support for productive agents.

With varying degrees of intensity and levels of coverage, support measures for small and medium-sized enterprises (SMEs) have been a constant feature of different historical phases and policy approaches. Likewise, development support programmes and export promotion have been a central plank of countries' competitiveness and diversification policies.

The institutional support framework for business innovation has also been strengthened in recent years, complementing programmes to support basic science, which has traditionally been the strong point of science, technology and innovation policies in the region, and to attract FDI.

Selective support for production activities deemed strategic or of great importance for countries' social and economic equilibria has been just as plentiful, and this was true even of the 1990s, a decade characterized to a greater extent by a discourse that was extremely critical of the public sector's economic role.

Some countries have also implemented policies using a collaborative cluster approach based on the triple helix model (public sector, private sector and business sector) in a number of specific sectors, with a territorial development perspective and with a better balance between bottom-up and top-down institution building. Examples of successful experiences in promoting cluster initiatives can be found in countries such as Argentina, Colombia, Costa Rica, Mexico and Uruguay, among others (Salazar-Xirinachs, 2022a and 2022b; Llinás-Vargas, 2021).

Certain of these initiatives have had significant impacts, in some cases enabling new sectors to develop and consolidate in the national economies concerned. Examples include the development of the Brazilian pharmaceutical sector, pursued under the Greater Brazil Plan (2011–2014), Ecuador's strategy for the development of the cacao chain and the policies adopted in Costa Rica for the creation of new production capabilities in the medical equipment industry (Salazar-Xirinachs, 2022a).

Despite the variety of experiences and the diversity of the efforts pursued, if the analytical evidence presented in the first part of this chapter is considered, the conclusion is that this set of interventions has had neither the critical mass nor the ambition necessary to significantly transform the region's production structure, with the exception of a few small economies such as Costa Rica and Uruguay, or in some specific territories at the subnational level. It is not in a lack of initiatives that the explanations for this result are to be sought, then, but rather in the characteristics of the policies implemented and the weaknesses of the institutions that have pursued them.

(d) A mainly horizontal approach to intervention has been maintained

Although many countries have in practice been appreciably relaxing the strictest precepts of neoclassical orthodoxy, which proclaimed the need not to alter market dynamics through State intervention, a very large number of measures have been designed without any sectoral orientation (see table II.7). For example, an evaluation of 246 support instruments for microenterprises and small and medium-sized enterprises (MSMEs) in seven countries of the region shows that only a quarter contain sectoral preferences (Dini and Rueda, 2020).

Table II.7

Latin America and the Caribbean: intensity of industrial policy instruments in Latin America and the Caribbean, by area and scope

Area	Scope		
	Horizontal	Selective	
		Existing sectors or clusters	New or newly developing sectors
Improvements in existing firms	● High	● Medium-high	● Medium-low
Creation of new firms	● Medium-low	○ Low	○ Low

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of C. Álvarez and T. Sutin, “Políticas industriales y tecnológicas en Chile: el desafío de la transformación productiva”, *Políticas industriales y tecnológicas en América Latina* (LC/TS.2017/91), M. Cimoli and others (eds.), Santiago, ECLAC, 2017.

Policies that do not discriminate ex ante by sector (commonly referred to as horizontal policies) are conceived as universal measures serving to eliminate obstacles that penalize all companies or a large majority of them (especially MSMEs) in areas such as access to credit, formalization and digital literacy. Examples include the Argentine Guarantee Fund (FOGAR), SIMPLES Nacional (a measure to promote the formalization of businesses in Brazil)¹¹ and the “Digitalize your SME” programme in Chile.¹²

To achieve significant results, the first condition is for these measures to have a wide coverage, i.e., to extend to a high percentage of enterprises in their target universe. The number of companies registered with SIMPLES increased from 2.5 million in 2007 to 4.4 million in 2012, while the “Digitalize your SME” platform, which includes a number of tools to encourage digitalization, increased the number of companies served by the different programmes tenfold between 2019 and 2020, from 20,000 to 212,699.

However, the most salient effects have been recorded when these measures have formed part of more concerted long-term strategies that have allowed issues to be tackled by concentrating on their objectives from different angles. The business formalization policy developed in Brazil since the mid-1990s,¹³ for example, began to have very positive results in the middle of the following decade, when the government enhanced its policy for the micro and small enterprise business environment by introducing SIMPLES Nacional (2006)¹⁴ and Complementary Law No. 128 establishing the special taxation and simplification regime for individual microentrepreneurs (2008);¹⁵ when procedures were designed to coordinate this with social measures, such as the Brazil Without Extreme Poverty Programme, launched in 2011; and when rules favouring public procurement from micro and small enterprises were established under the General Micro and Small Enterprises Act of 2006, among other measures.

When successful, these measures have succeeded in improving important if specific aspects affecting the competitiveness of broad sectors of business and may have helped to reduce the gaps between MSMEs and larger companies, but they have not substantially altered market dynamics or changed the production structure of the countries that have implemented them.

At the same time, it can be seen that the use of horizontal instruments is generally associated with a reactive type of intervention, where use of the available instruments depends directly on the initiative and interest of businesses, to the exclusion of more proactive forms of intervention that could be pursued

¹¹ See ILO (2014).

¹² See Heredia Zurita and Dini (2021).

¹³ SIMPLES Federal, established by Law No. 9317 of 1996, granted differentiated taxation treatment to micro and small enterprises (MSEs), unifying taxes and fees and simplifying formalization procedures (ILO, 2014).

¹⁴ This is a unified and simplified special new regime for levying, collecting and auditing the taxes and contributions of micro and small enterprises (MSEs) which allows MSEs to make a single simplified annual declaration for the payment of federal, state and municipal taxes and contributions, whose rates vary according to the sector of economic activity (ILO, 2014).

¹⁵ Business owners and self-employed workers whose gross annual turnover does not exceed 60,000 reais can register as individual microentrepreneurs. Once their status has been certified, in addition to the benefit of reduced and simplified tax payments, they have access to a basic old age, disability and survivor's pension, sickness and maternity benefit, and an allowance for their family in the event of imprisonment or death.

without forfeiting the basic criterion of neutrality. In a heterogeneous context marked by large differences in the productive capacities installed in the different territories of a country, or between economic actors and sectors, this supposed neutrality translates into a clear advantage for already consolidated companies and sectors, which have more solid professional structures, clearer strategic positions and closer contacts with public institutions.

(e) Institutional weaknesses, fragmentation and lack of convergence in support action

Closely related to the previous point is a second aspect that is part of what makes production development policies ineffective at driving structural change: the fragmentation of initiatives and the lack of convergence between different support measures.

The institutions in charge of production development policies are not completely lacking in coordination bodies. On the contrary, in areas such as SME policy, the last decade has seen a proliferation of committees coordinating different public entities, as well as spaces for dialogue between the public and private sectors (Dini and Rueda, 2020). In science and technology policy, meanwhile, there are numerous instances of public-private councils established to lay down strategic policy approaches, as in the case of Chile's National Council for Science, Technology, Knowledge and Innovation for Development and Argentina's Federal Council for Science and Technology, among others.

Despite these important advances, there are still significant weaknesses: in some cases, the overly bureaucratic functioning of these bodies has affected efficiency.¹⁶ In other settings, the collegiate bodies that have been created for mainly consultative purposes have been ineffective because they lack stability and resources of their own.¹⁷

However, these phenomena seem to be not so much the cause of a lack of coordination as the effect of a deeper-seated weakness in the design of production policies. This weakness consists in the frequent difficulty of building a broad and lasting consensus between the public sector, the private sector and civil society to identify national development options and, on this basis, to set priorities that can become the central focus for the actions of the various development institutions. The identification of common objectives strongly legitimized by consensus is the primary condition for generating convergence in political action and giving it long-term continuity. In the absence of a clear orientation, industrial policy in its broadest sense tends to become fragmented and dispersed into hundreds of isolated actions of very limited scope and magnitude, and is vulnerable to the fluctuations of political cycles.

This weakness is exacerbated by the fragility of public institutions. Public entities specializing in different aspects of production development (SMEs, science and technology, credit, support for business improvements, etc.) that operate relatively independently of politicians and on the basis of consolidated professional capabilities with a secure budget and a long-term perspective are the exception rather than the rule in the region. Table II.8 identifies noteworthy cases of institutions that have these characteristics.

¹⁶ Thus, for example, the recent reform of the General System of Royalties in Colombia abolished the Collegiate Administration and Decision-making Organ (OCAD), the body that selected productive development projects, and transferred this power to the government entity responsible for the territorial level concerned.

¹⁷ The above-mentioned study on SME policies in seven countries in the region, for example, mentions staff shortages, lack of operational continuity and frequent legal changes as some of the causes accounting for the inefficiency of many of the public-private dialogue bodies created in the last decade so that they could contribute to the design of support measures for this business sector (Dini and Rueda, 2020).

Table II.8

Latin America and the Caribbean: public institutions operating in different areas of industrial policy

Area of action	Leading institutions
SMEs	Brazilian Micro and Small Business Support Service (SEBRAE) (Brazil) Technical Cooperation Service (SERCOTEC) and National Institute for Agricultural Development (INDAP) (Chile) iNNpulsa (Colombia) National Commission on Micro-Enterprises and Small Businesses (CONAMYPE) (El Salvador)
Science and technology	National Institute of Industrial Technology (INTI) and National Institute for Agricultural Technology (INTA) (Argentina) Brazilian Association of Research and Industrial Innovation (EMBRAPI) (Brazil) National Agency for Research and Innovation (ANII) (Uruguay)
Business development	Production Development Corporation (CORFO) (Chile) National Development Agency (ANDE) (Uruguay)
Credit	Central Bank of the Argentine Republic (BCRA), Banco de la Nación Argentina and Banco de Inversión y Comercio Exterior (BICE) (Argentina) National Bank for Economic and Social Development (BNDES) and Banco do Nordeste (BNB) (Brazil) Foreign Trade Bank of Colombia (Bancóldex) (Colombia) Nacional Financiera (NAFIN) (Mexico)

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Countries lacking such entities are less able to design and implement new support programmes or measures, something that is particularly important when it comes to generating and disseminating new knowledge; they do not succeed in actively participating in the construction of interactive dynamics with policy actors, which limits their capacity for institutional learning, and they end up lacking vital tools for implementing recurrent practices of collective work with business associations and other development bodies, which makes it hard to build the relationships of trust and the social capital that are fundamental for support policies to perform well. Lastly, the absence of consolidated institutions heightens the volatility of support measures and the instability of policies, which are much more vulnerable to changes of government.

(f) Underresourcing and a limited range of support instruments

Although the resources invested by the different countries to finance industrial policies are difficult to estimate, let alone compare, recent studies¹⁸ on support systems for productive development in Argentina, Chile and Colombia allow the amount of subsidies invested by the public sector in the three countries to be estimated at approximately 0.5% of GDP;¹⁹ with a significant increase in investment in Argentina between 2019 and 2021 and a contraction in real terms in Chile and Colombia in the periods studied (2016–2019 in Chile and 2016–2020 in Colombia). In addition, tax expenditures to support the business sector in Argentina and Chile range between 0.5% and 1% of GDP.²⁰ A third area that has attracted the efforts of governments in the region is credit and guarantees. The investment made by the Ministry of Productive Development in the Argentine Guarantee Fund has already been mentioned. In Chile, a similar effort was made, again in the context of policies of support the productive sectors hardest hit by the COVID-19 pandemic (especially SMEs), to recapitalize the Small Business Guarantee Fund (FOGAPE).

Subsidies, tax expenditures and credits and guarantees are by far the most heavily used instruments in the region. Much less frequent is direct support to enterprises, owing to the weakness of public institutions, as mentioned in the previous section.

There are even fewer documented cases of public procurement aimed at developing productive capacities or direct investment in public enterprises to develop new sectors. Two interesting exceptions in this area are Argentina and Brazil, countries where, although the portfolio of public enterprises has been shrinking and is less imposing now than in previous decades, there are still public firms operating in sectors of medium-high technological complexity (e.g., nuclear technology in Argentina, aircraft in Brazil). Table II.9 illustrates this point qualitatively for five countries in the region.

¹⁸ On Chile and Colombia see, respectively, Correa, Dini and Letelier (2022) and Gómez (2021). The study on Argentina is still unpublished and under review.

¹⁹ Emergency and economic recovery programmes are not included.

²⁰ Up-to-date figures are not available for Colombia.

Table II.9

Latin America (5 countries): intensity of use of industrial policy instruments, by type

Type of instrument ^a	Intensity
Credits and guarantees	● High
Tax incentives	● Medium-high
Subsidies	● Medium-low
Direct support (services, assistance, information, etc.)	○ Low
Public procurement	○ Low

Source: Economic Commission for Latin America and the Caribbean (ECLAC).**Note:** The countries are Argentina, Brazil, Colombia, Chile and the Dominican Republic.^a The list of instruments is not exhaustive.

Lastly, productive development programmes promoted by national governments are generally designed at the central level, without proper adaptation to the different circumstances of subnational levels (states, provinces, regions or departments). This affects the relevance of productive development initiatives, which therefore tend to be rather ineffective at boosting the growth of the specific productive capacities of the different territories and thereby contributing to the diversification of the country's production matrix.

(g) The contrast with the international experience: developed world responses to the crisis

The return of industrial policies to centre stage has been one of the main responses of the developed world to a rapidly changing global context. Since the 2008 financial crisis, the governments of the world's major economies have implemented active strategies and policies to promote activity in manufacturing and other strategic sectors, such as environmental issues and the digital economy. They are thus focusing on production and technological innovation as a means of strengthening and repositioning their economies.

Although industrial policies have never ceased to exist, several factors have contributed to their resurgence in recent decades and their legitimacy as an important part of public policy. First, the failure of the non-intervention ("hands off the market") approach to generate the economic growth and jobs increasingly demanded by citizens. Second, concerns about deindustrialization and new models of global competition, the latter intensified by the emergence of China as the world's factory. Third, the challenges associated with new digital technologies and automation, which require investment in skills development and are fuelling a race for technological dominance. Fourth, the problems associated with climate change and its effects, which are increasing pressures on governments to provide swift and effective responses. Lastly, the pandemic and trade conflicts, exacerbated by the war between the Russian Federation and Ukraine, which have highlighted vulnerabilities in global value chains, giving a new impetus to onshoring and local development efforts.

These processes have laid new foundations for the adoption of industrial policies with broader and more explicit objectives. To traditional objectives such as innovation, productivity, economic growth and competitiveness have been added the pursuit of environmental and social goals that provide a normative horizon for government action, resilience and greater autonomy in the provision of items deemed strategic for national security. These have become increasingly common aspirations of industrial policies in recent years and of efforts to deal with the COVID-19 crisis, which have given them a new impetus. Examples include Made in Germany: Industrial Strategy 2030 (2019), the United Kingdom's Build Back Better plan and new innovation strategy (2021), the American Rescue Plan (2021), the Manufacturing USA Strategic Plan (revised in 2021) and Made in China 2025, among others.

The national strategies share a long-term vision that is intended to guide public and private policies and investments. The United States projects a vision of global leadership in advanced manufacturing.²¹ China, for its part, wants to consolidate its position as one of the industrial powers by 2025 and achieve leadership

²¹ According to the Manufacturing USA Strategic Plan (revised in 2021).

in key areas by 2035, with greater respect for the environment and less social inequality, according to the Fourteenth Five-Year Plan (2021–2025). Japan's strategy, meanwhile, is to implement what it calls "Society 5.0" or "Super Smart Society", entailing greater integration and convergence of advanced technologies (the Internet of things, robotics and big data) as well as more innovative industry that is more likely to help solve social challenges (Ministry of Economy, Trade and Industry, 2020; Cabinet Office, n.d.). Digital transformation and green transformation are in the offing for the world's major economies.

Approaches and concerns highlight policies oriented towards missions (solving challenges through public-private partnerships), territories (place-based), sectors or clusters and specific technologies (Criscuolo and others, 2022) by coordinating a wide range of vertical and horizontal instruments at different levels and seeking complementarities. Instruments target the supply side (e.g., through various forms of public funding along the entire innovation and production chain, as well as the provision of technology services) and the demand side, through public procurement, regulation and standards. Efforts are also being made to create the right conditions for business performance through vocational education and training, research institutes and technology services, infrastructure provision, etc., and to put in place suitable general economic conditions (capital market development, the tax system, entrepreneurship support policies, intellectual property management, etc.).

Another goal is to achieve synergies and complementarities between industrial policies and other key policies in areas such as trade, investment and competition. In the United States, the principle of favouring "allied" or "friendly" countries when choosing trading partners and promoting production relocation efforts was explicitly pursued already during the Trump administration, in the context of disputes with China.²² The government implemented a number of selective import tariff measures to discourage the entry of Chinese goods and control exports. These measures have been maintained or strengthened under the Biden administration, alongside an ambitious investment programme to develop local industrial capabilities. Likewise, under the Made in Germany policy, the German government adopted a strategic approach to FDI that includes oversight of technology companies acquired by third countries and the creation of a fund aimed at protecting companies deemed strategic for national security and technological autonomy. The policy document affirms that the State can acquire shares in companies "for a limited period of time" (Federal Ministry of Economy and Energy, 2019). Strategic management of trade and FDI policies, if conducted in a planned, consistent and systematic manner alongside industrial policy, can contribute to the mutual reinforcement of these policies.

Europe has shown a strong propensity to regionalize supply chains, something that is also observed in other parts of the world. According to data from the European observatory for clusters and industrial change, in 2020 there were 2950 cluster initiatives in 51 export sectors, accounting for almost 1 in every 4 jobs (61.8 million jobs) and about half of employment in exporting industries (European Commission, 2020). Australia, India and Japan launched the Supply Chain Resilience Initiative in April 2021 with the aim of supporting better use of digital technology and the diversification of trade and investment.²³ The new industrial strategy of the countries of the European Union includes lines of action that should enable them to enhance their autonomy in strategic areas by diversifying their international trade and investment partners, fostering industrial partnerships to accelerate investments in key technologies, and monitoring products that are sensitive because of their heavy external dependence (European Commission, 2021). It also includes measures to strengthen single market governance instruments and procedures, facilitate the movement of goods, people and services in crisis situations, promote the harmonization of standards and the digitalization of market oversight, and strengthen screening mechanisms for foreign direct investment.

This set of policies has gone along with increased investment in R&D. According to OECD, national R&D allocations as a percentage of GDP have been on an upward trend over the past two decades, rising from 2.1% of GDP in 2000 to 2.6% in 2020. Growth was particularly robust from 2018 onward. In developed economies and in China (the world's second-largest investor in R&D measured at purchasing power parity), the COVID-19 crisis led to an expansion of public R&D budgets. Adding in the recovery stimulus packages in those countries, industry support programmes have been evolving on an unprecedented scale.

²² See Government of the United States (2021) and Department of the Treasury (2022).

²³ See Ministry of Economy, Trade and Industry (2021).

(h) Summary

The twenty-first century began in Latin America and the Caribbean with something of a political shift towards left-wing or progressive governments, so it was to be expected that there would be a strong expansion of industrial policies, since the traditional discourses of these sectors have stressed the need to link profound social transformations with transformations of production structures. Although these policies made a notable comeback on the continent, their deployment was not as central or as well funded as might have been expected. Progressive governments tended to coincide with a period of booming demand and commodity prices, which strengthened the power of traditional sectors and blunted the edge of the discourse of structural change. The contribution of structural change policies to this economic performance, meanwhile, was marginal.

Thus, social and anti-inequality programmes, rather than involving a transformation of production structures, remained dependent on the resources generated by traditional activities. Indeed, it was commonly assumed that social inclusion could be advanced without significant productive changes, as the trajectory of improved demand and commodity prices was expected to continue uninterrupted for a prolonged period, lasting decades.

In this context, there were indeed major advances in industrial policies, including technology policies. On the whole, though, these advances were very cautious and very few resources were allocated for this purpose. Moreover, the structure of industrial policies continued to be dominated by horizontal, demand-driven policies, which tended to reinforce the prevailing structures. Sectoral and systemic policies slowly gained ground and attracted greater resources, but did not thereby becoming too central.

The policy shift towards more systemic approaches was delayed by the need to rebuild State capacities after the structural reform cycle, during which policies and powers were dismantled. The slow process of reconstruction allowed institutions to be progressively built up, which slowly bore fruit. Lack of capabilities and weakening belief in the need for structural change meant that many initiatives of this kind and many science and technology policy measures were confined to limited areas of public administration, without strong leadership at the highest level. As a result, many policies failed to acquire a systemic character. What is more, the new initiatives were superimposed on old ones without any overarching plan, the result in the Argentine case being what has been characterized as the coexistence of different geological layers of industrial policies.

Another important aspect is that macroeconomic policies were rarely coordinated with industrial policies, something that structuralist macroeconomists have repeatedly argued for over recent decades.

Lastly, major external changes occurred throughout this commodity supercycle and ended up having a decisive impact on policy and politics. The financial market crisis and the Asian crisis led to a time of uncertainty and negative impacts on the expansionary cycle. In this context, industrial policies in both Argentina and Brazil came to have a strong countercyclical component. The Greater Brazil Plan is an obvious example, but the situation was even clearer in Argentina, where policies to achieve balanced trade, reminiscent in form and spirit of the protectionist policies of many decades ago, took on great importance. But the final blow came with the end of the so-called commodity supercycle. Beginning in 2014, this shift undermined the foundations of the economic, social and political arrangements on which the growth and distribution model was built. Commodity-exporting sectors and the elites associated with them maintained their economic power and regained political power, pushing for a return to horizontal industrial policy models. The question is whether this shift towards a declining role for industrial policy in Latin America and the Caribbean has more permanent features. The answer is not yet clear. The pandemic necessitated a central role once again for public policy to combat its economic and social effects, and trends towards greater global geopolitical competition have strengthened industrial policies in the core economies, which will be mirrored to some extent in the periphery. The need for greater diversification of trading partners and goods is becoming more urgent in a world where trade is fragmenting, to reduce excessive dependence on a single partner. These issues are central to future development strategy and are discussed in chapter V of this document.

The recurrence of profound crises and political discontinuities in the Latin American experience presents a very different picture to policies in developed countries, which never abandoned industrial or science and technology policy and in fact have strengthened it following the crises of the last 15 years.

The countries of Latin America and the Caribbean are facing formidable challenges that can only be overcome through ambitious industrial policies of a systemic nature that (a) provide clear sectoral options based on considerations that take into account the potential for technological upgrading and productive diversification associated with the closing of gaps; (b) aim not only at higher productivity but also at environmental sustainability and social inclusion; (c) are coordinated with horizontal policies that reflect the emergence of innovative requirements and, in particular, the construction of demands by civil society and the State, called upon as these are to participate in the construction of strategic markets; (d) include a firm commitment to the development of a science and technology system that, while respecting and supporting the autonomy of this subsystem, encourages linkages and synergies with the productive sector. The great challenge for Latin America and the Caribbean is to involve very diverse economic and social actors in a strategy of this type.

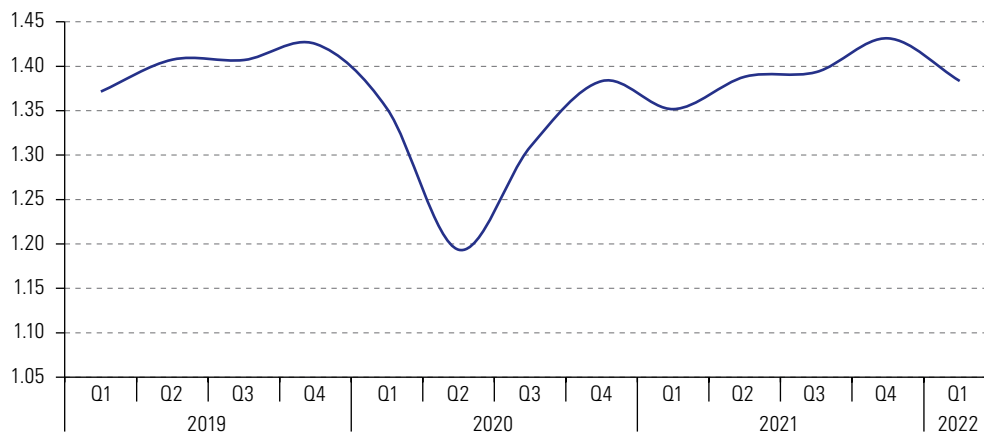
The continent remains in a situation of great political instability. What appeared to be a return to neoliberal policies is now being reversed in what seems to be a new turn towards more active social and industrial policies, stimulated by the recent crises and greater mobilization of more vulnerable sectors. At the same time, commodity prices, far from entering a phase of permanent decline, are once again on the rise, and not only because of the war in Europe. It is imperative for the region to learn from past experiences.

4. Less complex structures mean less resilience to crises

The previous sections discussed structural and policymaking problems that have created a tendency for the region to lag behind in terms of technology and production over the long term, with major negative consequences for equality and the political economy in the region.²⁴ These structures are also less resilient to the impacts of the recurrent crises affecting the region. As a result, the countries of Latin America and the Caribbean are facing a very challenging economic and social outlook in 2022. Poor economic growth performance is being compounded by strong inflationary pressures, a lack of dynamism in job creation, declines in investment and growing social demands. This situation has resulted in major challenges for macroeconomic policy, which needs to reconcile policies aimed at bringing about an investment-led economic recovery with policies to control inflation and reduce public spending. The situation has been made worse by the impacts of the Russian Federation's invasion of Ukraine and the geopolitical tensions discussed in chapter I.

As figure II.21 shows, the region's GDP recovered sharply after falling in the second half of 2019 and the first quarter of 2020. However, growth slowed towards the end of 2020, and in 2021 the economies returned to the low growth rates prevailing in the period 2014–2019, before the crisis, when they averaged only 0.6% per year.

Figure II.21
Latin America: gross domestic product, 2019 to first quarter of 2022
(Trillions of constant 2018 dollars)



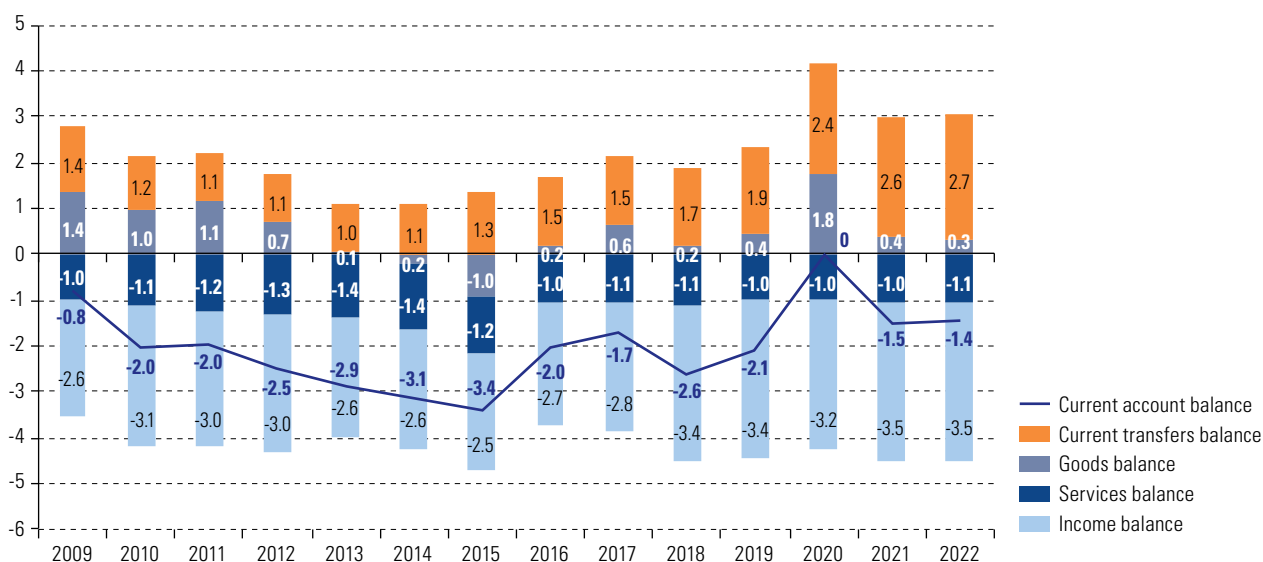
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures.

²⁴ This subsection is based on ECLAC (2022b).

On the external trade side, recent trends suggest that the outlook will make it more difficult to achieve growth rates sufficient to meet the region's social and employment requirements, as discussed in detail in section A of chapter V. The 2022 current account deficit will be 1.4% of GDP, close to that of 2021 (1.5%). This deficit is the net outcome of an increase in the current transfers surplus offsetting a slight deterioration in the other accounts (goods balance, services balance and income balance) (see figure II.22).

Figure II.22

Latin America (19 countries): balance-of-payments current account, by components, 2009–2022^a
(Percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures.

^a The 2022 figures are projections.

In 2022, the region's commodity terms of trade are expected to fall by an average of 7%, this being the net outcome of a 20% increase in commodity export prices and a 29% increase in commodity import prices. The impact will not be homogeneous across countries: hydrocarbon exporters will see an improvement in their terms of trade, while Caribbean countries that are not oil exporters and Central American countries will suffer the largest negative impact.

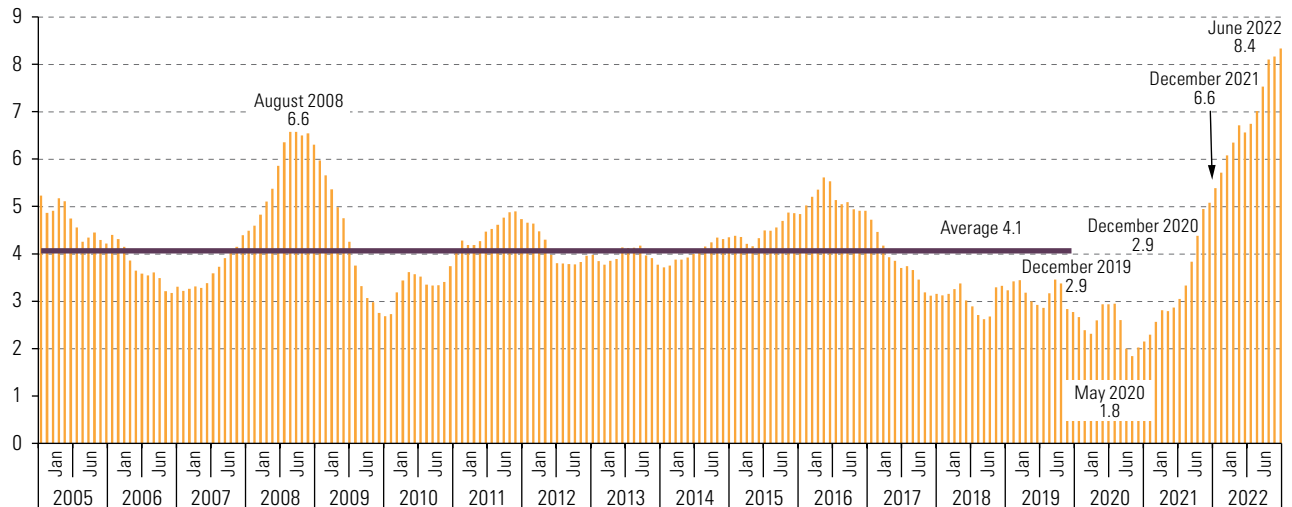
The region was a net recipient of capital in 2021, with a financial account surplus of 2.8% of GDP that allowed it to accumulate international reserves in addition to financing the current account deficit, but data available as of the first quarter of 2022 show inflows decelerating. This is explained by tighter global financial conditions, mainly since the outbreak of the war in Ukraine, which has had a negative impact on the external financing options available to emerging economies, including the countries of Latin America and the Caribbean.

Inflation has returned to the region and poses a threat to recovery efforts. Monetary policy interest rates are on the rise, and efforts to reduce the fiscal deficits generated during the pandemic are compounding matters. Inflation in the Latin American and Caribbean economies has been trending higher since May 2020, when the regional inflation rate stood at 1.8%. By the end of 2020, inflation was close to its pre-pandemic level, and in 2021 it reached a level similar to that during the global financial crisis.

In June 2022, the regional inflation rate was 8.4%, 1.8 percentage points higher than during the crisis and more than double the average for the period from January 2005 to December 2019 (see figure II.23).

Figure II.23

Latin America and the Caribbean: 12-month rates of change in the consumer price index (CPI), January 2005 to June 2022
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures.

Note: The averages exclude economies with chronic inflation (Argentina, the Bolivarian Republic of Venezuela, Cuba, Haiti and Suriname).

As of June 2022, the South American economies had the highest average inflation rate (8.7%), followed by the economies of Central America and Mexico (7.7%), while the economies of the English-speaking Caribbean had the lowest average inflation (7.4%).

As section C of Chapter V sets out in detail, progress with this set of problems will involve formulating and implementing macroeconomic policies to accelerate growth and investment, while addressing inflationary pressures.

Concluding remarks

Except for brief periods, the countries of Latin America and the Caribbean have continued to lag badly in technological and productive terms, especially since the 1980s. This compromises the region's capacity for growth on both the supply and demand sides. On the supply side, productive diversification has not been sufficient to sustain productivity gains and create new jobs in higher-productivity sectors. For this reason, structural heterogeneity remains a distinctive feature of the structure of production and employment in the region. On the demand side, Latin America and the Caribbean's heavy specialization in commodities, whose income elasticity of demand is lower than that of more technology-intensive sectors, is a persistent source of external imbalances that dampen growth. Cycles have short-lived and relatively weak upswings because aggregate demand quickly leaks abroad. Low Schumpeterian efficiency and Keynesian efficiency interact and reinforce each other, generating a low-growth trap that can only be escaped from with the help of long-term policies.

On an international comparison, these long-term policies have been absent or very weak compared to those implemented by countries that have been successful in terms of international convergence. Macroeconomic policies have kept the capital account open and left the region exposed to cycles of depreciation and crisis, with negative effects on the competitiveness of tradable goods. Appreciation helps with short-term stabilization but entails severer crises further down the road. Conversely, Asian countries took care to keep their real

exchange rates competitive. Industrial and technology policies, in turn, have been lacking or too weak. These policies have often been discontinued or assigned to ministries and secretariats with limited political influence and institutional capabilities. While Asia has sought to diversify exports and pursued consistent strategies in pursuit of industrialization and the creation of new sectors over time, Latin America and the Caribbean has remained dependent on a few commodities or low-skilled labour-intensive goods. The region has fallen into a low learning trap that needs to be broken out of, and some of the policies needed to achieve this are discussed in the following chapters.

These factors explain the strong impact that the crises brought first by the pandemic and then by the war in Ukraine have had on the region's economies in terms of GDP, poverty and unemployment. Responding to these crises also means responding to structural problems that may be harder to solve if the global economy fragments into hostile blocs. Latin America and the Caribbean must seek a stronger regional voice to defend an open multilateral system and its own right to development.

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CHAPTER



Inequality, employment and social policy

Introduction

- A. The production structure as a barrier to the creation of higher-productivity jobs
- B. The burden of structural heterogeneity: informality in total employment
- C. Middle-income sectors at risk: the pressures of hyperglobalization and the vulnerability of those left behind
- D. Migration: a window of opportunity and a reflection of development imbalances
- E. Climate change has distributional effects and accentuates inequalities within and between countries
- F. Social spending: recent boost and challenges for continuity

Concluding remarks

Bibliography

Annex III.A1

Introduction

Since the 1980s, inequality has risen sharply in many economies, especially in the developed world. In the United States, the ratio between the incomes of the richest 10% and the poorest 50% doubled between 1980 and 2020, while in the European Union it increased by more than 25% (World Inequality Lab, 2022). This has been the result of the wage share of income stagnating or falling, a decline in job quality and the deterioration of social policies. It is underpinned by several converging factors: greater concentration in the goods and services markets, which has enabled companies to increase the profit margins they apply to production costs; increasingly weak workers' unions; the path of technological progress, which tends to require primarily skilled workers and thus drives the expanding wage gap between skilled and least skilled; and changes in tax systems, which have become less progressive and are failing to remedy market-driven income inequalities (De Loecker, Eeckhout and Unger, 2020).

In many developing countries, income distribution took the opposite trend. The income inequality ratio decreased in Africa and Asia and declined slightly in Latin America and the Caribbean (by approximately 3%). The pattern in the Gini index was similar. The pattern is very mixed within each region, however. Many Latin American and Caribbean countries made progress in reducing inequality between 2004 and 2014, thanks to an expansion of social policies and formal employment. However, these positive trends have come to a standstill or have reversed since 2014 (or from 2015 onward, in the case of employment) (ECLAC, 2019).

The evolution of employment and social policies were two key contributors to the positive outcomes achieved between 2004 and 2012 in the fight against poverty and inequality in Latin America and the Caribbean. This chapter looks at these two factors and their interaction with other sources of inequality, such as those originating from environmental degradation. It has six sections, as well as this introduction and concluding remarks. Section A addresses the role of the production structure in creating formal jobs with growing productivity and wages. Section B looks at the importance of structural heterogeneity in an economy's average productivity and the vulnerability of labour. Section C examines a specific dimension of rising inequality: the growing weakness of the middle-income strata, which has significant political and social implications. Section D explores the role of migration—which reflects imbalances between countries and regions—in growth and inequality. Section E analyses the worsening of distributive problems (at the national and international levels) as a result of the environmental crisis. Lastly, section F focuses on a dimension long neglected in the region: the construction of a welfare state, whose absence weakens the capacity of the region's countries to design and implement development policies.

A. The production structure as a barrier to the creation of higher-productivity jobs

Chapter II discussed the idea that the constraint on growth lies in a production structure with low technological content and limited growth in demand for its goods and services in domestic and international markets. As a result, tensions arise systematically in the external sector of peripheral countries, weakening investment momentum and leading to low-learning and low-growth traps.

To restore external equilibrium, the conventional response includes two complementary paths: first, a policy of fiscal austerity to reduce domestic demand and consequently demand for imports, and second, an increase in exports by reducing the cost of labour. The cost of labour is reduced by making the labour market more flexible—including through temporary work or variable working hours, fewer restrictions on dismissals and more restricted labour rights—and through currency depreciation, by raising the nominal exchange rate or keeping nominal wage rises below the rate of inflation. In addition to reducing the cost of labour, a more flexible labour market is thought to facilitate movement of workers into the tradable goods and services sectors, which become more attractive as the currency depreciates in real terms. Recovery in growth and employment is thus supposedly based, at least initially, on rising exports.

The orthodox narrative has been questioned from different angles: from a theoretical perspective, because key aspects of the interaction between aggregate demand, wages, employment and productivity are lost in that narrative, and through empirical studies, because no clear positive relationship has been found between labour market deregulation and employment growth. Both these criticisms are discussed later.

1. Rigidity of the production structure versus labour market flexibility

This section argues that austerity and increased labour market flexibility can aggravate job quality problems without improving employment levels, and also problems of inequality. Several factors are involved in the relationship between labour market flexibility, wage cost and employment, including the pattern in aggregate demand and the manner in which it affects productivity. A graphical analysis of the relationships between these variables is presented in annex III.A1 (see box). The main points are summarized below.

To increase employment, aggregate demand in the economy must grow more than labour productivity. In turn, rapid growth in aggregate demand requires the peripheral economy to become more competitive, to prevent economic expansion from translating into unsustainable levels of imports and debt. The role of fiscal policy in this context is not to bring effective growth into line with the meagre potential permitted by the external constraint (by contractionary means), but rather to support public and private investment in research and development, science and technology, in order to shift the external constraint barrier. As seen in chapter II, a fall in public investment weakens private investment. Austerity reduces long-term growth by inhibiting investment and, with it, productive transformation and potential growth. Aghion and Kharroubi (2008) demonstrate that active countercyclical policies favour long-run growth in both GDP and productivity.

The pursuit of greater competitiveness through low wages runs counter to innovation. While a stable and competitive real exchange rate contributes to productive diversification, a policy that relies on successive devaluations as the main mechanism to compensate for a widening productivity gap has a quite different effect. In fact, it produces spurious competitiveness, as a rentier strategy that is just as unhelpful to learning as is dependence on natural resource rents. For this reason, progressive structural change—leading to greater inclusion and environmental stewardship—should not be confused with simply exporting more manufactures, since this increase may simply reflect lower wages rather than higher productivity. Oreiro and others (2019) report that the Economic Complexity Index (ECI) has a positive effect on job quality, as measured by the ratio of the proportion of employment in high-tech sectors to the proportion in low- and medium-technology-intensive sectors.

Labour market flexibility efforts have not produced the outcomes expected by the champions of such measures. The beneficial effects on employment and productivity that were initially expected waned over time (OECD, 2013). Some analysts found that greater labour flexibility increased unemployment in European economies during recessions (Ferreiro and Gómez, 2019). Longer-term employment contracts can contribute to higher productivity by strengthening the commitment of workers to firms and of firms to workers' training (OECD, 2004, chapter 2). Similarly, higher real wages stimulate technological and organizational innovations to reduce the unit cost of labour, a point made early on by Sylos Labini (1993).¹ In addition, better distribution of the benefits of technical progress results in more positive attitudes towards cooperation and innovation, which are hallmarks of a more cohesive and egalitarian society.

The strategy of adjustment through currency depreciation and wage reductions as sources of international competitiveness could be nullified (or more than offset) not only by the dampening of innovation, but also by the response from trading partners in a globalized world (for example, through competing devaluations). The world as a whole is a closed economy, and not everyone can have positive net exports at the same time. Although small countries might expect their policies not to attract the attention of other countries, the “fallacy of composition” means that the expectations of at least some must be frustrated (Blecker and Razmi, 2008).

¹ See also Storm and Nasteppad (2012), and Fontanari and Palumbo (2022).

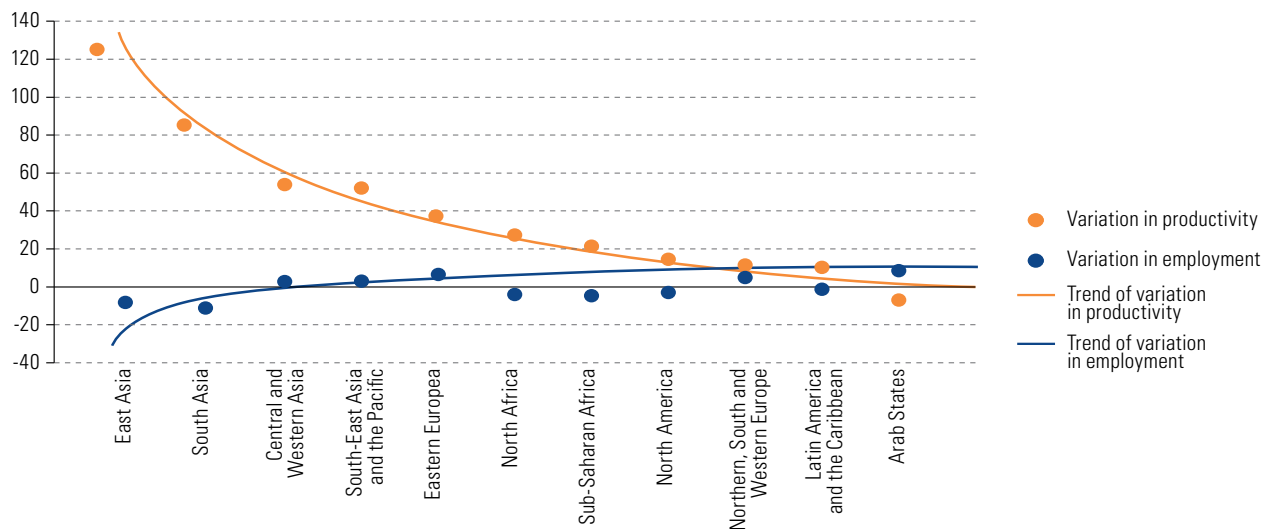
To create new jobs globally, global aggregate demand needs to grow faster than global labour productivity (Capaldo and Izurieta, 2013; Porcile and Sartorello Spinola, 2018). Under the current rules of international governance, in which deficit-running countries are forced to reduce their growth, this objective is more difficult to achieve. Export-led growth in some countries, if it lasts, necessarily has a counterpart of (unsustainable) debt-led growth in others. Paradoxically, the policy response in most countries has not been an effort to correct imbalances through greater international cooperation, but rather to weaken such cooperation.

In short, the barrier to the creation of high-quality jobs arises from the rigidity of the pattern of specialization. The result is slower growth in aggregate demand and overall employment, depending on the intensity of the technological and productive lags analysed in chapter II.

2. Employment, productivity and wages

An analysis of productivity and employment by region between 2005 and 2019 reveals a negative relationship between variation in productivity and in employment. However, this relationship is not linear and, in many cases, later goes into reverse. As shown in figure III.1, in East Asia and South Asia, the two regions with the highest productivity growth over the period analysed, employment rates fell by 5 and 12 percentage points, respectively, over the period. However, Central and West Asia and South-East Asia and the Pacific achieved productivity gains of more than 50%, with rises in employment rates of 2 percentage points. Similarly, Eastern Europe combined a 40% productivity gain with a rise of 7 percentage points in the employment rate. In Latin America and the Caribbean, there was a slight drop in the employment rate and an almost zero increase in productivity.

Figure III.1
Variations in productivity and employment, by region, 2005–2019
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from the International Labour Organization (ILO).

More diversified and more technology-intensive production structures enable higher productivity levels and support higher employment rates. Table III.1 shows the results of a fixed-effects panel exercise, which shows the employment rate relating positively to an indicator of technological and productive capabilities: the Economic Complexity Index (ECI). The exercise includes several control variables, including per capita income, the quality of the institutions in the country and per capita exports. The result is in line with that obtained in chapter II, according to which there is a positive relationship between the growth rate of the economy and the Keynesian efficiency of its exports. ECI and Keynesian efficiency are closely tied to a country's technological capabilities. A higher growth rate makes labour productivity growth compatible with employment growth. The positive interactions between technology, diversification and employment are analysed in annex III.A1 (see box).

Table III.1

Employment rate and structure complexity: a fixed-effects panel exercise

Empl_rate	Coeff.	Standard error t		P>|t|
LnYpc	-1.15392	0.0853329	-13.52	0.000
Xpc	0.0000779	5.52e-06	14.11	0.000
ECI	0.3318924	0.0742117	4.47	0.000
Gov_ef	0.3417134	0.1904507	1.79	0.073
_cons	70.87254	0.6983712	101.48	0.000
sigma_u	10.092209			
sigma_e	1.9310497			
rho	0.9646818	(fraction of variance due to u_i)		
F test : F(112, 2421) = 525.72		Prob > F = 0.0000		

Source: World Bank, “Worldwide Governance Indicators” [online] <https://databank.worldbank.org/source/worldwide-governance-indicators>; for the Economic Complexity Index: Observatory of Economic Complexity (OEC), “Country Rankings (ECI)” [online] <https://oec.world/en/rankings/eci/hs6/hs96?tab=table>; for the other variables: United Nations, UN Comtrade Database [online] <https://comtrade.un.org/> and Economic Commission for Latin America and the Caribbean (ECLAC), CEPALSTAT [online] <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en>.

Note: LnYpc: natural logarithm of per capita income.

Xpc: per capita exports.

ECI: Economic Complexity Index.

Gov_ef: government institutional efficiency indicator. This indicator reflects perceptions of the quality of public services, the quality of the civil service and its degree of independence from political pressure, the quality of policy formulation and implementation, and the credibility of the government’s commitment to policies.

It is important to note that aggregate employment rates mask considerable gender differences. As shown in figure III.2, the labour force participation rate is much lower for women than for men in Latin America and the Caribbean. Similarly, the unemployment rate is higher for women than for men, a gap that widened during the COVID-19 pandemic. In this regard, as noted in ECLAC (2022b, p. 77), “The lag in women re-entering the labour market in the wake of the pandemic is also related to the slower recovery in the economic sectors that account for a larger proportion of women’s employment [...] in comparison to other sectors. The fact that women’s return to the labour market has been gradual likewise reflects the heightened need for care that was greatly apparent during the pandemic.”

Data from some core countries (the United States, Japan and countries in Europe) indicate that productivity gains do not fully translate into wage gains. Therefore, labour productivity growth has outpaced real wage growth since 1970 in the United States and Europe, and since 1980 in Japan (Stansbury and Summer, 2017; Pasimeni, 2018). This divergence in the growth of the two variables has been called “the great decoupling”. Data for Europe indicate that the extent of the decoupling varies significantly among countries as well as among sectors within the same country (Schröder, 2020).

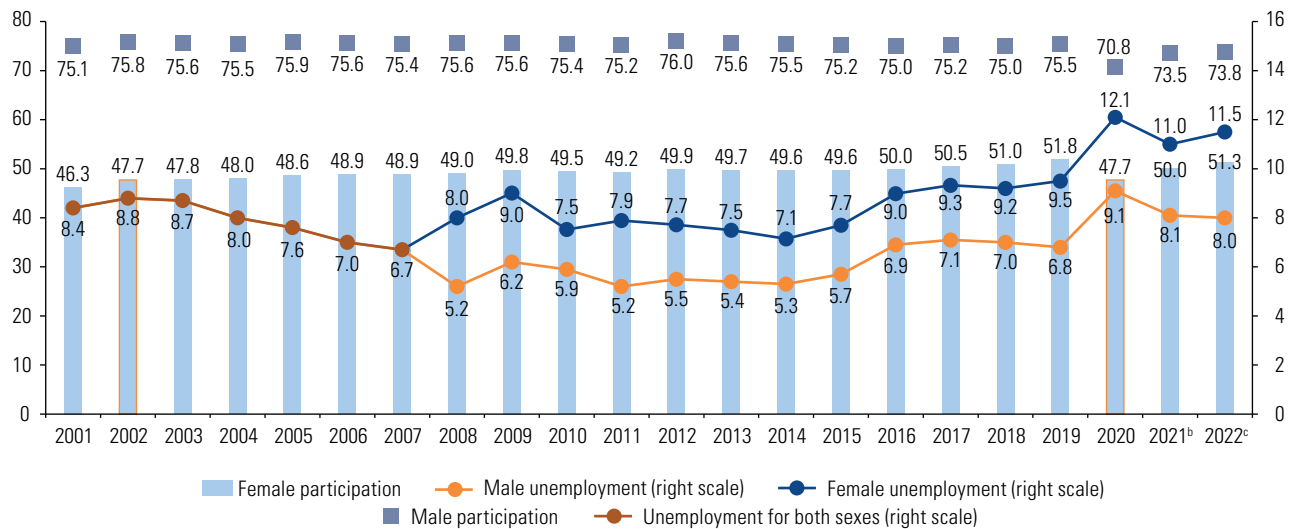
Productivity and real wage patterns in Latin America may be analysed together, using data from household surveys and national accounts from Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru and the Plurinational State of Bolivia between 1975 and 2018. The two variables are seen to diverge: productivity grew by 0.4% while real wages fell by 0.4%. In the case of the real labour income of wage earners, wages were 14% lower in 2018 than in 1975, meaning that workers lost considerable purchasing power.

There are large differences among countries in the region. Looking at the three largest economies in Latin America and the Caribbean (Argentina, Brazil and Mexico), aggregate labour productivity declined from US\$ 25,146 in 1980 to US\$ 24,141 in 2019, while real wages fell from US\$ 7,633 in 1980 to US\$ 7,357 in 2019. In this case, the two variables decreased at a similar pace over the period.

The aggregate picture changes when the analysis is performed at the sector level, as patterns differed from sector to sector. In the aggregate, in the same three countries (Argentina, Brazil and Mexico), productivity and wages rose in the primary sector and the mining and quarrying sector between 1980 and 2019, while in the manufacturing, construction, and accommodation, restaurant and commerce sectors, both variables declined. Since employment is highly concentrated in the latter sectors, this trend has very damaging consequences for workers’ well-being.

Figure III.2

Latin America and the Caribbean (24 countries):^a participation rate and unemployment rate, by sex, weighted average, 2001–2022 (Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of ECLAC, *Preliminary Overview of the Economies of Latin America and the Caribbean, 2021* (LC/PUB.2022/1-P), Santiago, 2022, official figures from the countries and projections.

^a Includes Argentina, Bahamas, Barbados, Belize, Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Plurinational State of Bolivia, Trinidad and Tobago and Uruguay. Figures for 2019 do not include the Bolivarian Republic of Venezuela.

^b Estimates for 2021 from *Preliminary Overview of the Economies of Latin America and the Caribbean, 2021*.

^c Projections for 2022 from *Preliminary Overview of the Economies of Latin America and the Caribbean, 2021*.

Table III.2 shows wage dispersion among sectors for an aggregate of the economies of Argentina, Brazil and Mexico. Heterogeneous production structures translate into segmented labour markets with highly unequal wages among workers. Thus, a worker in the primary sector receives an average labour income that is half that of a worker in the manufacturing industry, and only 26% of that of a wage earner in mining and quarrying in 2010. Labour informality is both a reflection and a driver of this segmentation, as discussed in section III.B.

Table III.2

Argentina, Brazil and Mexico: wage dispersion across sectors, 1980–2019

	1980	1985	1990	1995	2000	2005	2010	2015	2019
Agriculture, hunting, forestry and fishing	37	41	46	45	41	48	58	56	58
Mining and quarrying	152	183	126	202	230	283	264	198	222
Manufacturing industries	125	119	116	116	114	111	120	99	102
Electricity, gas and water	194	156	166	406	308	203	201	170	182
Construction	90	80	89	80	81	76	81	86	81
Trade, restaurants and hotels	92	95	92	63	55	51	56	77	75
Transportation, storage and communications	121	135	130	120	164	204	209	107	113
Financial institutions	185	187	181	266	289	249	193	129	127
Community, social and personal services and public administration	98	99	103	155	133	133	146	126	129
Total	100	100	100	100	100	100	100	100	100

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

B. The burden of structural heterogeneity: informality in total employment

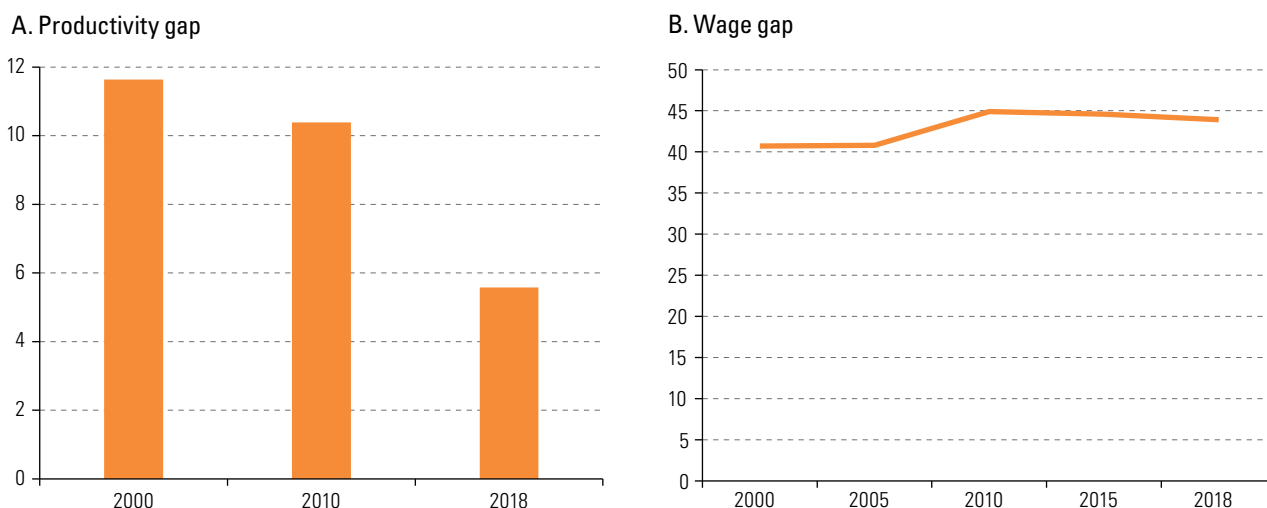
Structural heterogeneity is most visible in the proportion of low-productivity employment in total employment.² Low productivity can be seen as a quantitative proxy for labour informality, which is a structural phenomenon in Latin American and Caribbean countries. The two concepts (very low-productivity jobs and informal jobs) will be used interchangeably in this section.

1. Structural heterogeneity

According to ECLAC estimates for 12 countries, 50.4% of the region's workers were in informal work in 2020, and this percentage is expected to rise sharply over the coming years, owing to the COVID-19 pandemic (see figure III.3 and section III.B.2). The impacts of the pandemic clearly demonstrated how vulnerable this group of workers is to crises.

Figure III.3

Latin America (8 countries):^a productivity gap and wage gap between formal and informal sector workers, 2000–2018
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Note: The informal sector comprises low-productivity activities and includes the following categories: domestic service, non-professional wage earners, unpaid family workers, and persons employed in microenterprises with fewer than five workers. Estimates of employment distribution and labour productivity are based on ECLAC data derived from national household surveys. Labour productivity in the informal sector is estimated from the average income of informal workers, which is considered a good proxy for the value added generated by the informal sector, owing to the nature of the activities performed in it.

^a The countries included in the sample are Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru and the Plurinational State of Bolivia.

Informality directly affects overall productivity and therefore growth, reducing the average productivity of an economy. Informal activities are of low productivity and concentration of the labour force in the least productive sector dampens overall productivity. Figure III.3 shows the widening gap between formal and informal sector productivity (see figure III.3A) in eight countries in the region and the large wage gap between the two sectors (see figure III.3B). The burden of structural heterogeneity magnified the successive crises, especially in the pandemic.

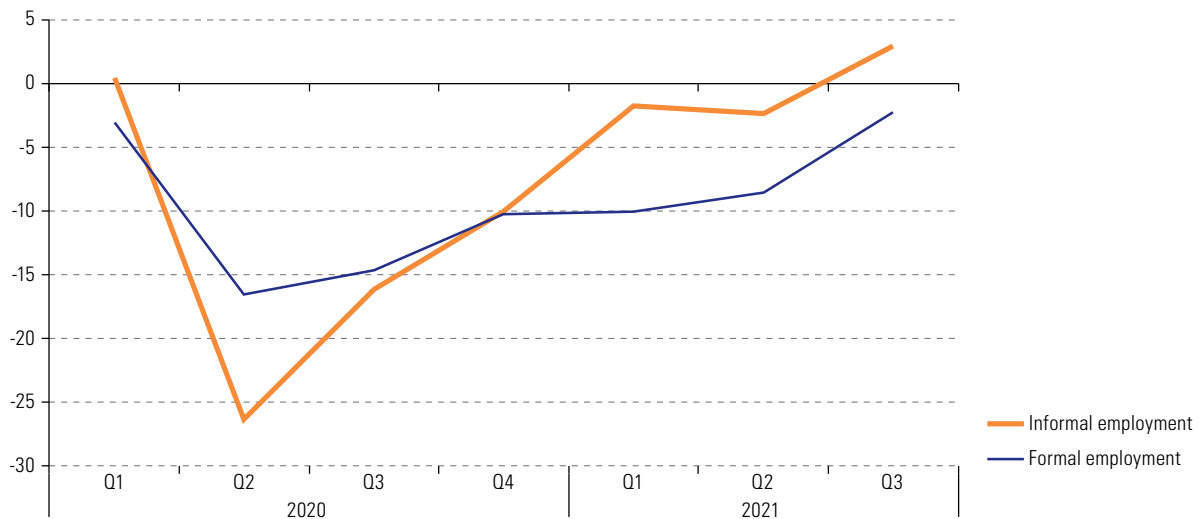
² The proportion of low-productivity employment is measured by taking as a group non-professional, non-technical own-account workers together with wage earners and employers of microenterprises, those working in domestic service and unpaid workers. In the regional comparison, this indicator is used as a proxy for informality.

2. Informality and crises

In the first half of 2020, the health crisis had considerable effects on the region's labour markets and informal workers in particular. This situation was unprecedented: in other crisis periods, as formal employment fell, informal employment generally began to act countercyclically and increased (see figure III.4). During the COVID-19 pandemic, however, informal employment did not serve as a safe haven or alternative for people who had lost their wage employment. This more restricted access to informal jobs affected young people, less-skilled workers and women the most (Acevedo and others, 2021; Maurizio, 2021; ILO, 2022; Salazar-Xirinachs, 2022).

Figure III.4

Latin America (10 countries):^a variation in number of workers (formal and informal), simple average, compared to 2019 (Percentage variations)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Labour Organization (ILO), ILOSTAT [online database] <https://ilostat.ilo.org/>.

^a Includes Argentina, Brazil, Chile, Costa Rica, the Dominican Republic, Ecuador, Mexico, Peru, the Plurinational State of Bolivia and Uruguay.

Although informal employment was severely affected by the immediate impact of the crisis, it subsequently led the partial recovery in jobs (around 70% of net job creation in several countries in the region) (ILO, 2022). This informal employment recovery reflects the reopening of small businesses and the return of many own-account workers to activities that had been interrupted by health-related restrictions and lockdowns. In addition to the recovery in informal employment, transitions to informality may also continue, not only among those who left the labour force immediately or became unemployed but also among those who managed to maintain a contract of employment, but who may lose their formal jobs as the crises wears on (ILO, 2020). Figure III.4 shows how the informal employment rate has changed, taking 2019 as a baseline. Initially, there is a drop between the first and second quarters of 2020, followed by a recovery and a slight rise to above pre-pandemic levels by the end of 2021.

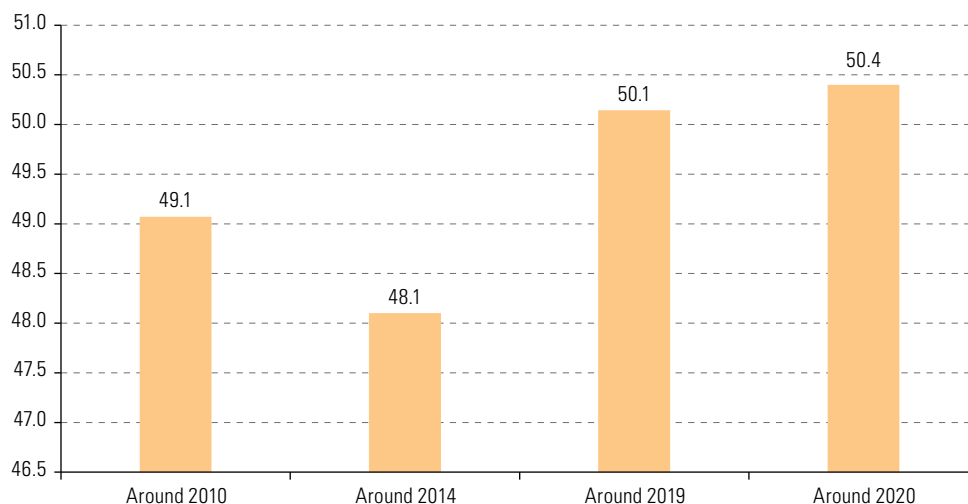
3. Informality is multidimensional

Informality encompasses all occupations and forms of production carried out by people who receive an income from them, but whose working conditions are not formalized or regulated by a legal framework. This situation makes workers highly vulnerable in terms of income, working conditions, access to labour rights and social protection (Espejo, 2022; ILO, 2022). According to ECLAC (2008), informality is generally not the result of workers' preference for self-employment or informal working conditions based on an economic rationale, but is often rather the only route into the labour force. The limited capacity of higher-productivity sectors to absorb labour by creating formal jobs leads to highly segmented access to high-quality employment and social protection, as well as considerable household income inequality (Abramo, 2021; Infante, 2011).

In the 2000s, formalization gathered pace in the region, in a context of faster economic growth, higher demand for labour and specific public policies to this end (ECLAC/ILO, 2014; Salazar-Xirinachs and Chacaltana, 2018). In the 2010s, formalization slowed—and even reversed in some cases—in a new situation of economic stagnation and deteriorating labour indicators. As a result, as shown in figure III.5, the level of informality in 2019 (50.1% of workers) was slightly higher than in 2010 (49.1%). This meant that the labour landscape was already adverse prior to the COVID-19 health crisis (Maurizio, 2021; ILO, 2022).

Figure III.5

Latin America (12 countries):^a employed population aged 15 and over in low-productivity sectors (informality), weighted average, around 2010, 2014, 2019 and 2020
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of special tabulations of data from Household Survey Data Bank (BADEHOG).
^a Includes Argentina, Brazil, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Mexico, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay.

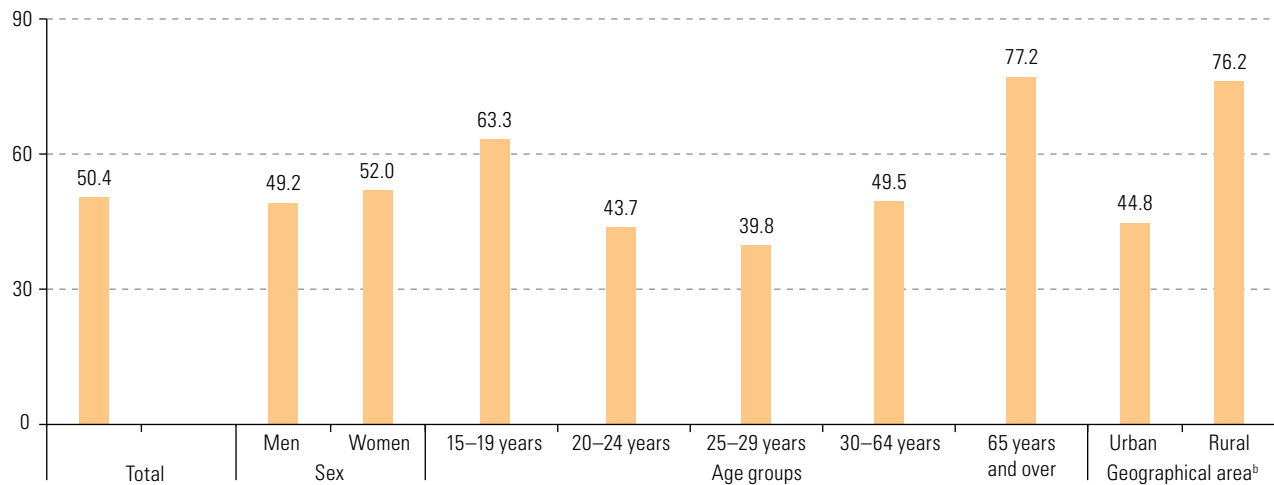
The segmented labour market is a key contributor to the high levels of inequality in the region (ECLAC, 2016). Social inequality is reflected in several areas of rights and well-being, one of which is access to decent work. Gaps in access to decent work are not uniform throughout the working-age population, but are strongly linked to what ECLAC has called the axes of the social inequality matrix, such as gender, age, socioeconomic level, race and ethnicity, disability and migration status. Also contributing to this inequality is a persistent culture of privilege,³ which has been carried over since colonial times and reproduced through various means of naturalizing considerable inequalities and discrimination. Women, young people and indigenous and Afrodescendent people are overrepresented in the most precarious jobs. In the region, informality is intermeshed with the axes of social inequality and there are severe gender, socioeconomic, age-related, ethnic and racial, and territorial inequalities. These structural axes of the inequality matrix are intertwined, feed into each other and string together over the life cycle. Ultimately, they influence other areas of well-being and rights, in addition to the level of access to decent work (ECLAC, 2016).

According to ECLAC estimates, in Latin America, a higher percentage of women (52.0%) than men (49.2%) were employed in low-productivity jobs. If informality is analysed in relation to workers' locations, a higher prevalence is found for rural areas (76.2%) than for urban areas (44.8%) (see figure III.6). Persons with disabilities and migrants also tend to encounter greater barriers to formal employment. Lastly, young people are overrepresented in informal employment.

³ "The notion of 'culture of privilege' refers to a series of rules, values and institutional mechanisms through which social inequalities are legitimized and perpetuated" (ECLAC, 2016, p. 13).

Figure III.6

Latin America (12 countries):^a employed population aged 15 and over in low-productivity sectors, by sex, age group and geographic area of residence, weighted average, 2020
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of special tabulations of data from Household Survey Data Bank (BADEHOG).

^a Includes Argentina, Brazil, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Mexico, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay.

^b Does not include Argentina, because its survey is urban only.

4. New forms of informality

Rapid transformations in production, organization and technology are driving profound changes in the labour markets of Latin America and the Caribbean. Although many countries have made efforts to create decent work, new concerns have arisen about the impact of technological progress on the labour market and the risk of more widespread informality owing to the destruction of formal jobs in traditional sectors of activity that are in the midst of transformations, insufficient creation of formal jobs in new sectors of activity, and the emergence of new jobs that require skills that most workers do not necessarily have.

With the advent of the fourth industrial revolution and growing digitalization of the world's economies, "atypical"⁴ forms of employment are spreading, and with them new and complex challenges for social protection systems and labour relations, including their regulation (ILO, 2016; Abramo, 2021). One of these forms of employment is work mediated by digital platforms. Such employment includes web-based jobs, where the employment relationship between the worker and the employer—both of whom can be located anywhere in the world—is mediated by an Internet platform. The development of intermediation technologies has a direct effect on the creation of new jobs and new forms of employment. While digital platforms create new job opportunities both locally and on global digital markets, the work often falls outside existing local regulations, which deprives workers of the labour and social rights established by the corresponding legislation (ECLAC/ILO, 2019). These are therefore atypical forms of employment that are generally on the boundary between wage work and self-employment (Abramo, 2021).

The growing prevalence of work mediated by digital platforms has thus led to significant obstacles to the creation of decent work, in particular because such work is often temporary and part-time, giving rise to problems of job insecurity, low income and underemployment. In this respect, a study by Berg and others (2019) found a high level of hourly underemployment among workers using these platforms. In a survey conducted as part of that study, 88% of respondents stated that they would like to do on average 11.6 more hours per week of work on the platforms. Large gender gaps were also found among those workers, with women spending on average almost 5 hours less working on the platforms than men, who spent 24.5 hours per week. For women, whose working hours tend to be concentrated in the afternoons or evenings, it is even more difficult to combine this type of work with caregiving responsibilities.

⁴ The concept of atypical employment is constructed in opposition to the traditional concept of the typical employment contract, which implies a service in a relationship of dependence for a direct employer performed in a permanent and full-time arrangement at the employer's establishment (Goldin, 2020, p. 8, cited in Abramo, 2021).

During the COVID-19 pandemic, however, platform-based work became an essential form of employment, owing to the need to maintain deliveries of basic goods and reduce face-to-face contact.

Although women are less likely to perform this type of work than men, those who do see it as an alternative that helps them to reconcile the caregiving tasks that they primarily shoulder, owing to the unequal sexual distribution of work in society. In some situations, this form of work enables paid activities to be combined with care tasks or, for young people, with studies (Robles and Tenenbaum, 2021). There is also a high proportion of migrants in this form of work, compared to local workers. This percentage tends to be much higher for platforms with lower entry barriers, such as delivery platforms, but lower among those requiring considerable capital investments, such as those involving passenger transport (ECLAC/ILO, 2021). Lastly, young people are overrepresented in this type of work, largely because it can be seen as an alternative to unemployment—which is high among youth—and because only limited qualifications or experience are required for entry.

In all cases, it is important to adapt existing policies or design new measures to actively promote formalization, reduce precarious work and create decent working conditions, with mechanisms for access to social protection.

C. Middle-income sectors at risk: the pressures of hyperglobalization and the vulnerability of those left behind

1. Evolution of the middle-income strata in Latin America over the past two decades

As discussed in chapter I, the middle-income sectors are a factor of political stability and can help to consolidate democratic regimes. In Latin America, the trajectory of these sectors shows significant idiosyncrasies, however. In terms of stratification of access to income and poverty levels, a significant number of households managed to rise out of poverty between the early 2000s and the mid-2010s, leading to somewhat optimistic narratives that the countries of the region were transitioning towards largely middle-income societies. ECLAC has remained cautious in that regard because, given the region's heterogeneous production structure—with high levels of informality and sharp differences in productivity between sectors and in access to social protection in general—, any solidity and stability in the living conditions of non-poor and middle-income sectors can hardly be considered equivalent to the consolidation of a stable middle strata. In other words, where income, productive activities and access to social protection are all precarious, the population is highly vulnerable to a variety of shocks that can push households back into poverty.

Between 1990 and 2015, the percentage of the Latin American population living in poverty fell from 51.2% to 29.0%, and from 15.5% to 8.8% in the case of extreme poverty. However, levels of poverty and extreme poverty flattened and even increased slightly between 2015 and 2019 (from 29.0% to 30.5% and from 8.8% to 11.4%, respectively), rising considerably once again between 2019 and 2020 in the context of the pandemic and the resultant economic recession. ECLAC estimated that, by 2020, poverty and extreme poverty reached levels of 33.0% and 13.1%, respectively. By 2021, the incipient economic recovery resulted in a very modest decline in poverty, to 32.1%, and a marginal but steady increase in extreme poverty, to 13.8%. Meanwhile, the middle-income strata expanded from the beginning of the 2000s until around 2015 (ECLAC, 2021b).⁵ They represented 26.9% of the population in 2002, and 41.1% by 2017 (ECLAC, 2019, p. 26). After stagnation between 2019 and 2021 in a period marked by the pandemic and then a sluggish recovery, low- and middle-income strata once again grew, in relative terms, meaning that some of the progress that had been made was lost.

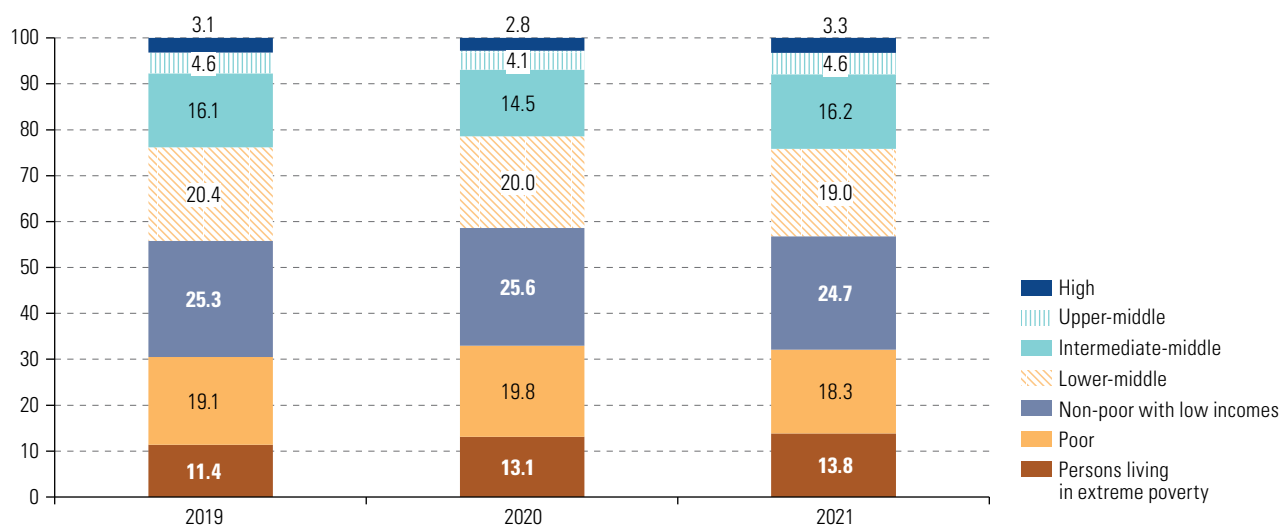
⁵ Based on household income, ECLAC has identified three strata: (i) low-income, with per capita household income below 1.8 times the poverty line; (ii) middle-income, between the low stratum and up to 10 times the poverty line; and (iii) high-income, with per capita income above the latter threshold. The low and middle groups are further subdivided into three substrata: the low-income group is made up of people in extreme poverty, poor people who are not in extreme poverty and non-poor people, while for the middle-income group, a distinction is made between people with low, medium and high incomes (ECLAC, 2022a, pp. 71–72).

In 2019, just before the onset of the pandemic, the middle-income strata continued to represent 41.1% of the population (see figure III.7). By 2020, the percentage of the low-income population had increased by 2.8%, while the middle-income group had fallen by 2.4% and the high-income group had shrunk by 0.3%. This means that there were “an additional 20.4 million people in the low-income stratum that year, relative to 2019, and a net reduction of 14.6 million people in the higher-income group: 12.9 million fewer people in the middle-income stratum and 1.8 million fewer in the high-income stratum” (ECLAC, 2022a, p. 72).

Figure III.7

Latin America: population distribution by income stratum, 2019–2021^a

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), Social Panorama of Latin America, 2021 (LC/PUB.2021/17-P), Santiago, 2022, on the basis of Household Survey Data Bank (BADEHOG).

^a The figures for 2021 are projections.

ECLAC projections (2022a) point to a recovery in the proportion of middle- and upper-income strata, albeit at lower levels than before the pandemic. A drop of 1.8 percentage points is projected in the proportion of persons in the low-income stratum, mostly offset by an increase in those in the middle-income stratum (1.3 percentage points). In absolute terms, this corresponds to an outflow of 7.8 million people from the low-income stratum and an increase of 13.4 million in the middle-income stratum (with an estimated increase of 5.6 million people, according to population projections). However, despite these advances, persons in vulnerable strata—meaning the sum of those in lower-middle-income and low-income strata and those living in poverty and extreme poverty—still represent 75.8% of the population, a level similar to that in 2019 (ECLAC, 2022a, p. 72; see also section III.E).

In short, for reasons related to both the production structure and gaps in social protection systems and to the complex global and regional juncture, there are no guarantees of the stability and continuity of advances made in the expansion of the middle-income strata, which, rather, are under threat. To the contrary, people in vulnerable strata make up most of the population, whether they are living in poverty or are likely to fall back into poverty in the event of any negative economic shocks.

2. Towards a new social contract: the role of middle-income strata

In most countries, the pandemic sparked the roll-out of policy instruments old and new to compensate for lost income and opportunities in a broad range of population segments, in many cases including not only the lowest-income but also the middle-income sectors. This period has increased the complexity of several pre-existing structural challenges related to productivity, inequality, sustainability and climate change. The global situation has

now brought other risks and emergencies, which threaten the path towards recovery and make the prospect of a period of stability with shared prosperity and cooperation more distant. The pandemic produced renewed appreciation of the value of public action in general, and of public services and social protection systems in particular, as societal assets for facing adversity and building resilience for managing change and transitioning towards sustainable models, while ensuring dignity and well-being and limiting the uncertainty and vulnerability faced by all, not only those in the lowest strata of society. In that regard, ECLAC has called for the building of true welfare states as a foundation for sustainable development in a context of greater equality.

The current succession of crises and challenges have given centre stage to the need to redefine the social contract, in which uncertainty and adversity are a collective, shared threat and more of a constant than an exception. In this regard, ECLAC has envisioned a social compact as a political instrument based on broad and participatory dialogue that enables the attainment of long-term consensus and agreements that are adapted to this new reality. In defining this new compact, middle-income sectors play a critical role and are among the groups who must be part of the transition towards more sustainable and solidarity-based development models. Amid the high labour informality and large gaps in social protection systems in the region, and faced with the dilemma of extreme vulnerability, middle-income sectors have historically resorted to private means of maintaining well-being and gaining protection from risks. This forced resort to private, individual means of protection against precarity and adversity has, on the whole, generated considerable reticence and mistrust in relation to increasing the tax burden in order to gradually strengthen and build up the State's capacity to guarantee the provision of quality, universal public services and social protection mechanisms to deal with uncertainty and individual and collective shocks. In that regard, the pandemic opened up a window of opportunity that remains open. At the current juncture, for example, the guarantee of greater access to health, the provision of income support or the expeditious vaccination of the entire population could form a bridge, over the short and long terms, on the path towards a new social compact. From that perspective, the concept of a progressive fiscal compact must therefore be accompanied by very specific goals, such as providing financial sustainability for broad-based social protection that benefits the population as a whole and receives sustained social and political support (ECLAC, 2022a, p. 33).

In addition to the challenges of inclusion, there is an imperative to move towards sustainable economies. As envisaged in the 2030 Agenda for Sustainable Development, and in particular Sustainable Development Goal 12, the transition to a green economy requires societies to progressively adopt more sustainable production and consumption patterns. This transition will not happen on its own and will require significant mobilization of resources as well as the development and continuous updating of skills. Achieving such a deep transformation of production and consumption will require addressing the costs of the transition and compensating those called upon to adopt or update skills, adapt lifestyles and redefine their place in the labour market and even their life plans. It is therefore essential to have universal social protection systems and to safeguard a basic level of welfare and access to social services, especially education and health, not only to compensate for and reduce losses for large swaths of Latin American societies but also to avoid broadening or creating new inequality gaps as collateral effects of this structural transition towards sustainability.

D. Migration: a window of opportunity and a reflection of development imbalances

International migration has always been one of the main concerns of development and human rights. International asymmetries and domestic inequalities are often at the root of migration. These inequalities push a great many people to seek better opportunities for work and well-being in countries that are relatively more developed or that have better security, institutional stability and access to public goods. In other cases, migration is forced by war, persecution, natural disasters or the destruction of the environment and the poverty that it brings. Population ageing and family reunification are also significant factors in the intensity and direction of migration.

Whether migration is selective or forced and mass-scale, it plays a significant role in demographic and social reproduction, as well as in economic activity. From a long-term perspective, it is important to continue fostering the contribution of migration to the welfare and development of the communities and countries of the region. That contribution is multivalent, from the expansion of labour markets and the creation of more diverse and youthful societies to the challenges of interculturality (ECLAC, 2019).

1. The positive impact of migration on countries of origin and destination

Through their work and the taxes they pay, international migrants contribute to the development and GDP growth of destination countries. In Chile, for example, the migrant labour force contributed 13.4% of GDP growth between 2009 and 2017 (Canales, 2022). In the case of Costa Rica, the total contribution of the migrant labour force increased over the past decade from 8.7% between 1999 and 2008 to 9.3% between 2010 and 2019 (Oviedo Carballo, 2022).

The work of migrants also makes significant contributions to countries and households of origin through remittances, which provide income to meet basic needs. Remittances have been resilient during the social and health crisis caused by the pandemic: officially recorded flows to Latin America and the Caribbean amounted to US\$ 127.6 billion in 2021, 26% more than in 2020 (Maldonado and Harris, 2022).⁶ Mexico captured 40.4% of the remittances in Latin America and the Caribbean in 2021 and remains the largest recipient of remittances in the region. However, as a share of GDP, remittances to Mexico represent far less than for other countries in the region—just 4% in 2021. In El Salvador, Honduras and Jamaica, remittances represent over 20% of GDP. In 2021, Central America received US\$ 33.487 billion, becoming the subregion with the fastest annual growth in remittances in the region (29.4%) (Maldonado and Harris, 2022).

The Caribbean subregion received US\$ 18.159 billion in remittances, for a year-on-year increase of 20.2%. The Caribbean countries that saw the highest annual growth in remittances were the Dominican Republic, at 26.6%, and Jamaica at 19.5%. Remittances to South America came to US\$ 24.333 billion, representing growth of 23.8%. Growth rates were positive in every country in the subregion, including those that depend little on remittances, like Chile, which saw annual growth of 3.3%. In all three subregions, remittance growth rates exceeded estimated per capita GDP growth: in the Caribbean, they were 94% higher; in South America, 71% higher; and in Central America, 394% higher (Maldonado and Harris, 2022).

2. Vulnerability and inequality

In terms of access to formal employment and social protection, significant gaps remain in Latin America and the Caribbean between the native-born population and the migrant population. The lack of decent work is a key factor affecting migrant workers in the region and is related to problems with legalization and the absence of institutions to foster their labour market inclusion. According to a study by Carrasco and Suárez (2019), looking at variables such as sex, age and education in seven countries in Latin America (Argentina, Brazil, Chile, Costa Rica, the Dominican Republic, Mexico and Uruguay), migrant workers—men and women alike—have fewer opportunities to gain work requiring higher qualifications. Although, in some cases, the employment rate for migrant workers may be higher than for the native-born population, there is a vast gap in terms of job quality (Carrasco and Suárez, 2019). High levels of informality and a lack of social protection have clear impacts on migrants' access to rights and better living conditions. Length of residence in the destination country does not necessarily lead to better working conditions.

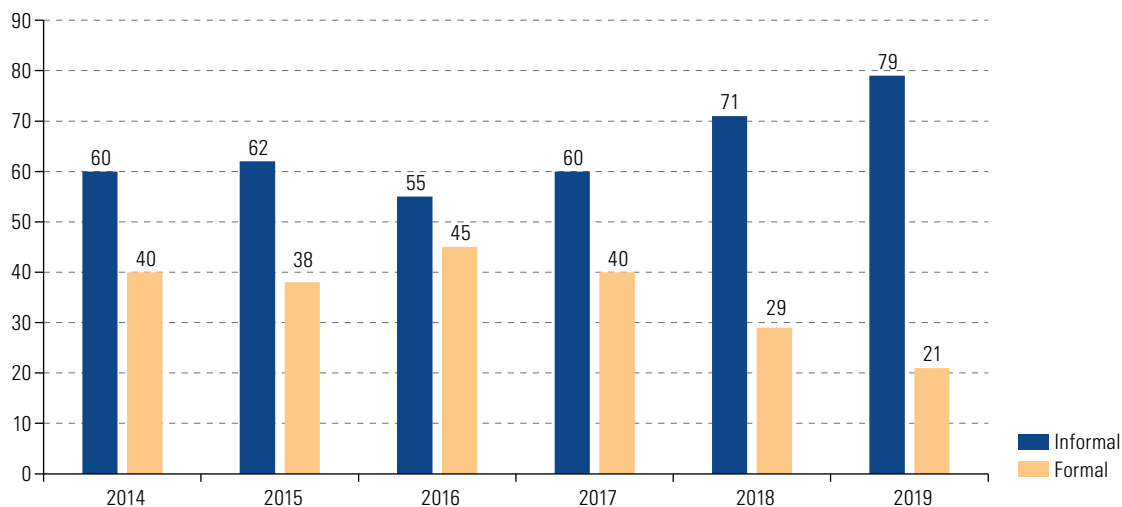
The rate of informal employment among immigrants in Peru increased by 19% between 2014 and 2019, with 8 of every 10 migrant workers in informal sector employment by the latter date (see figure III.8) (Vásquez Luque and Aguilar Lluncor, 2022). Similarly, in Costa Rica, 58.7% of migrants who had jobs in 2019 were working in the informal sector (see figure III.9). The activities with the highest proportions of migrants in informal jobs are construction (78.8%), other service activities (79.4%) and paid domestic work (75%) (Oviedo Carballo, 2022).

⁶ In the first few months of 2022, remittances have increased by 14%, and the World Bank is projecting annual growth of approximately 9% (ECLAC, 2022b).

Figure III.8

Peru: employment rate of the immigrant population by formality status, 2014–2019

(Percentages)

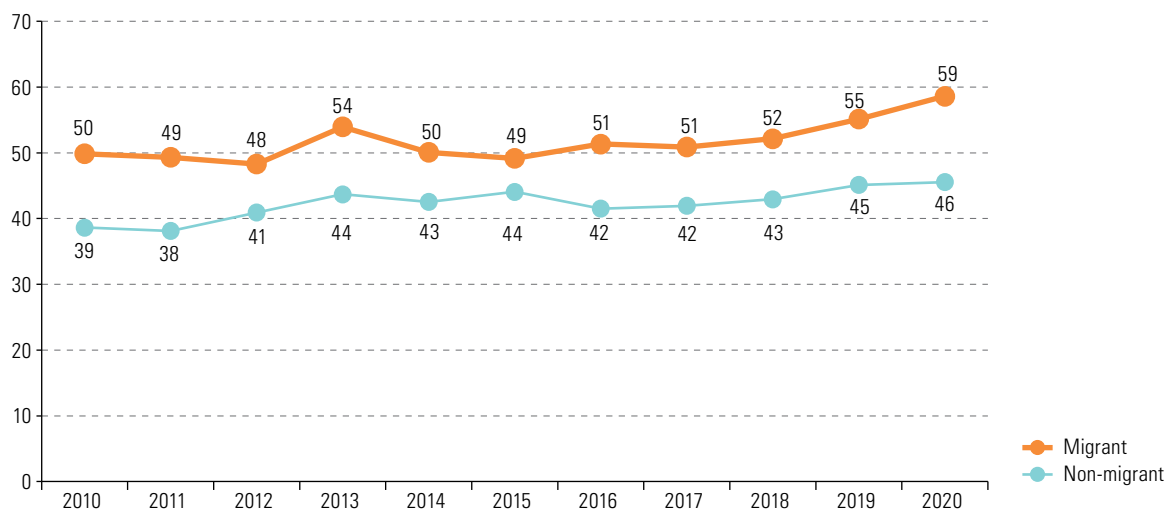


Source: T. Vásquez Luque and D. Aguilar Llunctor, “Contribuciones de las migraciones recientes al desarrollo sostenible: el caso de Perú”, *Sobre las contribuciones de la migración al desarrollo sostenible: estudios en países seleccionados*, Project Documents (LC/TS.2021/195), J. Martínez Pizarro and M. Cano Christiny (eds.), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022, on the basis of the National Household Survey (ENAH).

Figure III.9

Costa Rica: informal employment by migration status, 2010–2020

(Percentages)



Source: L. A. Oviedo Carballo, “Contribuciones de la migración reciente al desarrollo sostenible: el caso de Costa Rica”, *Sobre las contribuciones de la migración al desarrollo sostenible: estudios en países seleccionados*, Project Documents (LC/TS.2021/195), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022, on the basis of the Continuous Employment Survey (ECE).

The deficit of decent work for migrants in the countries of the region worsened during the pandemic despite the critical support they provided during lockdowns. During the pandemic, the most vulnerable migrant populations found subsistence niches in work where the risk of contagion was highest,⁷ in health centres, morgues and cleaning services, as well as in home delivery services and paid domestic work. Although most of these jobs do not meet the standards for decent work, they provide an alternative for those with irregular migration status who lack information and networks that could help them enter work with better guarantees and social protection (ECLAC/ILO, 2021).

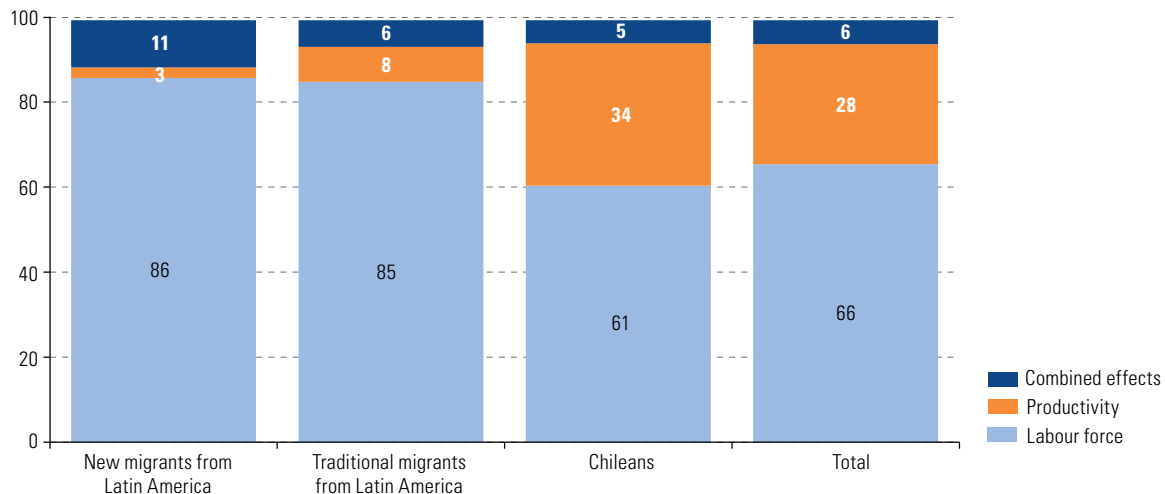
⁷ Migrant workers, both men and women, were also more exposed to COVID-19 owing to poor living conditions and overcrowding, as well as lack of access to drinking water, preventative measures and equipment and hygiene.

The pandemic also turned a spotlight on the dependence of certain sectors on migrant labour. For example, in Costa Rica, movement restrictions significantly affected the agricultural sector, prompting authorities to provide more flexible conditions for migrant workers to enter the country to work at harvest time.⁸

Another important point is the skill-related underemployment of migrant workers, when a mismatch arises between migrant workers' high level of education and the skills level of the employment they are able to find. Because of barriers to labour market entry and to the recognition of qualifications, the rate of those working in jobs for which they are over-qualified is higher among migrants than among the native-born population (Carrasco and Suárez, 2019).

Figure III.10

Chile: composition of GDP growth, by growth factor and migratory origin of the labour force, 2009–2017
(Percentages)



Source: A. Canales, "Estudio de las contribuciones de las migraciones recientes al desarrollo sostenible: el caso de Chile", *Sobre las contribuciones de la migración al desarrollo sostenible: estudios en países seleccionados*, Project Documents (LC/TS.2021/195), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022, on the basis of national accounts and data from the Central Bank of Chile and the National Social and Economic Survey 2009 and 2017.

This disadvantage for migrants may be seen as a short-term advantage for destination countries, because migrant workers fill jobs that native-born workers are not taking. While in the short term, the labour deficit is filled by migrant labour, in the long term, countries need to take advantage of the full potential of migrants to contribute to sustainable development, no longer as simply one more element of the labour force, but to increase productive capacity. To achieve this, skills and educational credentials need to be recognized so that migrants can enter jobs that match their qualifications, and institutions must support their labour market participation. In the case of Chile, although 13% of economic growth between 2009 and 2017 was attributed to migrant labour, its contribution was mainly the result of a larger workforce rather than higher productivity (see figure III.10) (Canales, 2022).

In short, migration can play a positive role, whether migrants add to the local labour supply or send remittances to their countries of origin. At the same time, it is important to avoid situations where the greater vulnerability of migrant workers leads to abuses that weaken or segment the labour market and favour inequality, and to allow these workers to fully develop their potential based on their qualifications and skills. As large-scale population movements can magnify this vulnerability, policies such as those discussed in chapter V are needed to reduce development asymmetries.

⁸ This was done through a bilateral agreement on regulating temporary work signed between Nicaragua and Costa Rica, whose protocol came into effect on 2 November 2020 and was renewed in September 2021 [online] <https://www.presidencia.go.cr/comunicados/2020/11/autoridades-de-costa-rica-y-nicaragua-realizan-reunion-para-analizar-acciones-para-el-ingreso-temporal-y-regulado-de-trabajadores-nicaraguenses/>.

E. Climate change has distributional effects and accentuates inequalities within and between countries

Although climate change, by definition, is a global phenomenon, it has distributional effects that are highly unequal on several levels. Indeed, climate change reflects and reinforces a fundamental asymmetry, at both the international and national levels: those who contribute the most to generating it are those who suffer the least from its effects or have the best chance of minimizing them. This section discusses some of the distributional impacts of climate change, namely the increased vulnerability of less developed regions and of the poorest people, and the rise in poverty.

1. A fundamental asymmetry: external and internal dimensions

Despite the fact that, as a region, Latin America and the Caribbean generates just 10% of global emissions, it is far more vulnerable to their effects than countries and regions that are bigger polluters. Developing countries, which include most Latin American countries, are located in the upper left quadrant of panel B of figure III.11, which corresponds to countries with high vulnerability and low preparedness for the effects of climate change. However, as reflected in panel A, which shows the share of total emissions, they emit less CO₂, and therefore contribute less to climate change. Central America and the Caribbean are subregions with significant asymmetry between their vulnerability and the share of global greenhouse gas emissions they generate.

According to the most recent hypotheses of the scientific community, to limit temperature warming to below 1.5 °C above pre-industrial levels, emissions must be reduced by between 38% and 63% by 2030 compared to 2019 levels (IPCC, 2022b). This entails annual degrowth of between 4% and 9% over the next eight years. By mid-century, emissions must be reduced by between 75% and 98%, which means that nearly the entire global economy must achieve carbon neutrality (IPCC, 2022b). To put this into perspective, it is estimated that emissions reductions attributable to the COVID-19 pandemic amounted to 6% in 2020, a figure that needs to be maintained to achieve a trajectory that aligns with the climate target.⁹

Figure III.11

Climate change: a fundamental asymmetry

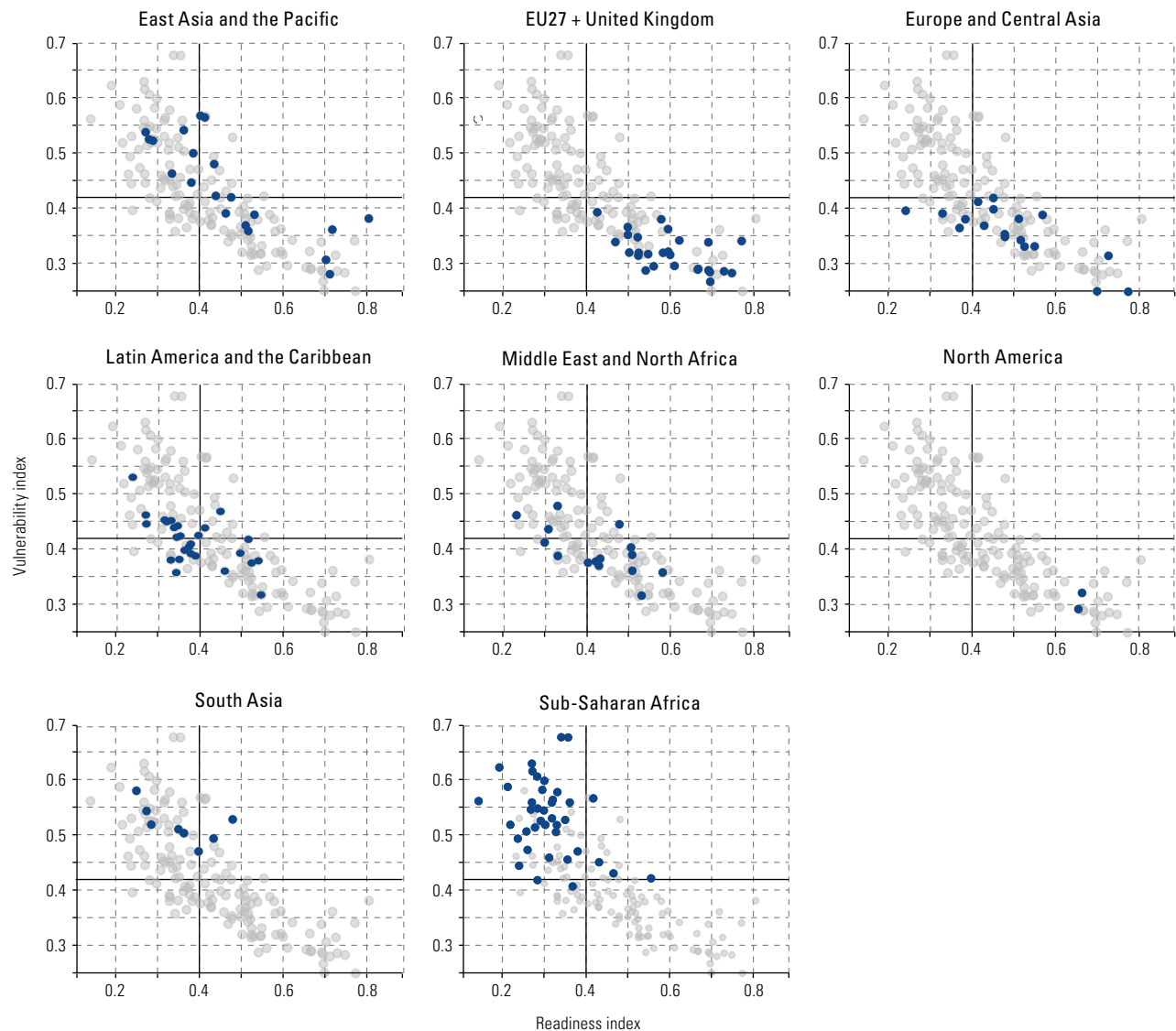
A. Share of global emissions by region, 2019

(Percentages of total emissions of 60 GtCO₂e_q)



⁹ This figure includes only CO₂ emissions from burning fossil fuels and from industrial processes.

B. Vulnerability and readiness index for the various regions, 2019



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of J. C. Minx and others, "A comprehensive and synthetic dataset for global, regional, and national greenhouse gas emissions by sector 1970–2018 with an extension to 2019", *Earth System Science Data*, vol. 13, No. 11, November 2021, and University of Notre Dame, "ND-GAIN Country Index", Notre Dame Global Adaptation Initiative [online] <https://gain.nd.edu/our-work/country-index/>.

In the last three years, Latin American and Caribbean countries have confirmed their determination to reduce emissions: 25 countries have already updated their national commitments to combat climate change (see table III.3). The new unconditional pledges by 2030 target an emission reduction of 22% from the baseline scenario, compared to the 13% announced in 2015 (Samaniego and others, 2022a), while under the conditional pledges, the reduction will be 28%, compared to the 23% originally announced in the nationally determined contributions. In addition, Argentina, Barbados, Belize, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Jamaica, Panama and Uruguay—which account for around 50% of regional emissions—have announced commitments to transition to carbon-neutral economies by 2050. Chile, Colombia, Costa Rica, Guatemala and Mexico have even published their long-term strategies for the period through to 2050, as required under the Paris Agreement.

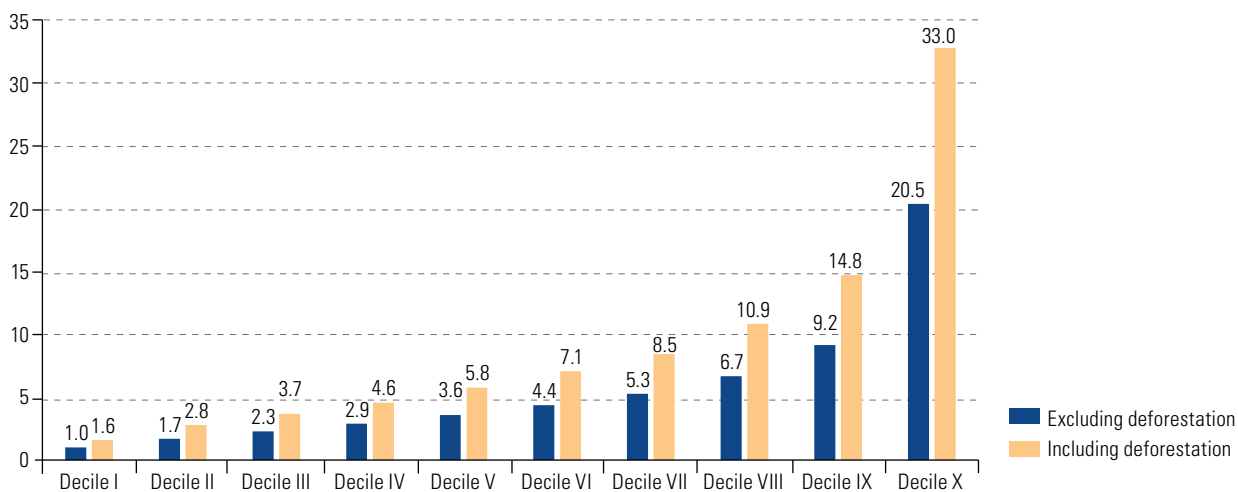
Table III.3
Latin America: nationally determined contributions

First nationally determined contribution, 2015 (8 countries)	Updated commitments, 2020–2022 (25 countries)		
Bahamas	Antigua and Barbuda	Costa Rica	Panama
Dominica	Argentina	Cuba	Peru
Ecuador	Barbados	El Salvador	Paraguay
Guyana	Belize	Dominican Republic	Saint Kitts and Nevis
Haiti	Bolivia (Plurinational State of)	Grenada	Santa Lucia
Saint Vincent and the Grenadines	Brazil	Guatemala	Suriname
Trinidad and Tobago	Chile	Honduras	Venezuela (Bolivarian Republic of)
Uruguay	Colombia	Jamaica	
		Mexico	
		Nicaragua	

Source: Update from J. Samaniego and others, “Panorama de las actualizaciones de las contribuciones determinadas a nivel nacional de cara a la COP 26”, *Project Documents* (LC/TS.2021/190), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022.

There is also asymmetry at the national level, which, combined with that discussed above, results in a twofold inequality. The poor are generally most vulnerable to the negative impacts of climate change, while their contribution to greenhouse gas emissions within a given country is lower than that of higher-income groups, as seen in figure III.12, which shows emissions by income decile. The wealthiest 10% is responsible for 30% of emissions (including from deforestation). This is the result of segmented and highly differentiated fossil fuel consumption patterns.

Figure III.12
Latin America: per capita greenhouse gas emissions, by income decile (Tons)

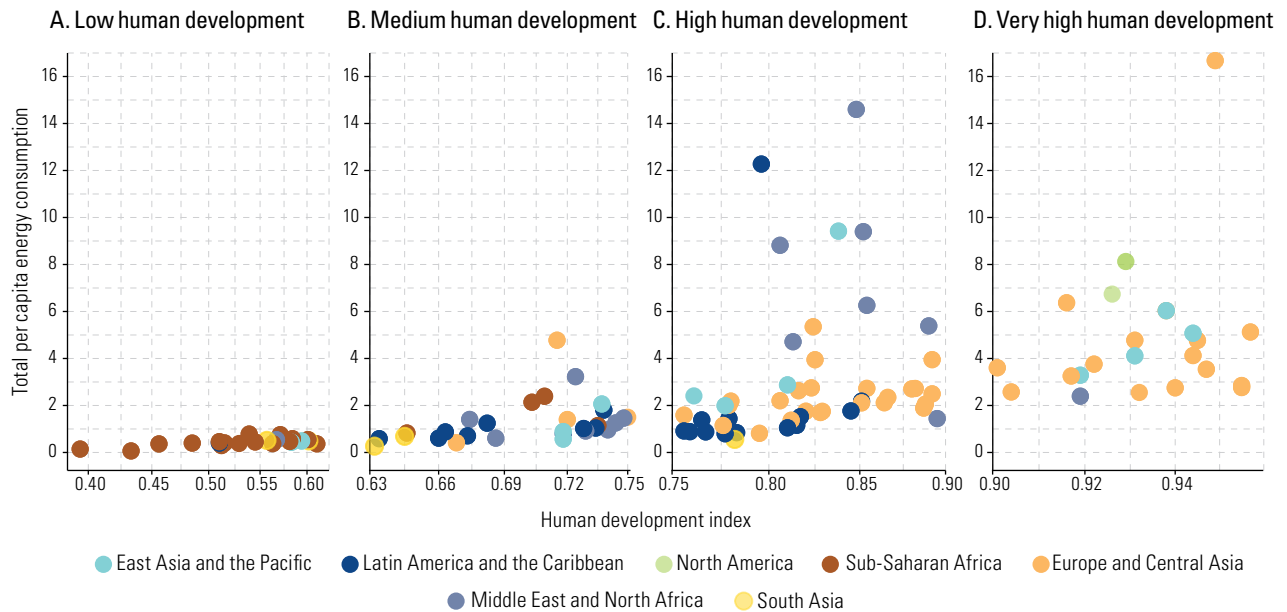


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of CEPALSTAT [online database] <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en>; J. C. Minx and others, “A comprehensive and synthetic dataset for global, regional, and national greenhouse gas emissions by sector 1970–2018 with an extension to 2019”, *Earth System Science Data*, vol. 13, No. 11, November 2021, and University of Notre Dame, “ND-GAIN Country Index”, Notre Dame Global Adaptation Initiative [online] <https://gain.nd.edu/our-work/country-index/>.

It is important to note that, in contrast with per capita GDP and per capita emissions, where higher per capita income is associated with higher emissions per inhabitant, it is possible to achieve a high level of human development while keeping energy consumption in line with climate goals.

Figure III.13

World: human development index and total per capita energy consumption, 2019



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from the International Energy Agency (IEA) and the United Nations Development Programme (UNDP).

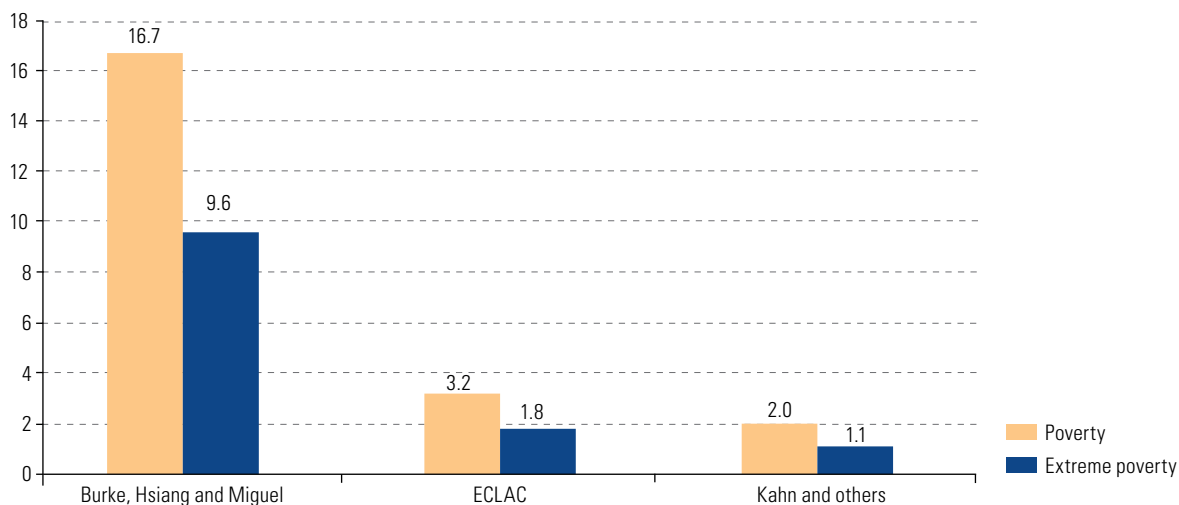
Figure III.13 shows that there are many countries with low levels of emissions and high or very high levels of human development. Exploring so major a topic as the relationship between GDP and human development is beyond the scope of this section. However, the figure suggests that there are better ways than GDP to express the welfare of a population. This redefines policy objectives, which should focus less on growth, especially in countries with higher per capita incomes. The search for sustainability at all three levels (economic, social and environmental) should aim not only to decouple emissions from GDP growth but also to redefine the relationship between GDP and well-being, which has very important implications for equality and the provision of public goods.

2. Climate change and poverty

One particularly important aspect of the regressive effects of climate change is the increase in poverty levels in Latin America and the Caribbean. Climate change has multiple direct and indirect impacts on poverty, beginning with the negative effect of higher temperatures on economic growth in the region. Estimates indicate that a 1 °C increase in the average annual temperature leads to a reduction in the real per capita GDP growth rate of around 1%. For example, although the annual per capita GDP growth rate of the countries of the region between 1970 and 2020 was 1.5%, if temperatures increased by 1 °C, annual growth would have been more than two thirds lower (Samaniego and others, 2022). Based on estimates of the decline in growth and its effects on poverty (Gasparini, Cicowiez and Sosa Escudero, 2013; Bourguignon, 2003; Samaniego, Sánchez and Alatorre, 2022), 2030 poverty levels can be projected on the basis of per capita GDP growth trends (1.7%) and compared with the poverty levels projected in a scenario of reduced per capita GDP caused by climate change.

Figure III.14

Latin America: poverty resulting from the chronic impact of climate change on per capita GDP, 2030

(Difference compared to a scenario without climate change, millions of people)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of M. Burke, S. M. Hsiang and E. Miguel, “Global non-linear effect of temperature on economic production”, *Nature*, vol. 527, No. 7577, November 2015; ECLAC, *Social Panorama of Latin America, 2021* (LC/PUB.2021/17-P), Santiago, 2022 and M. Kahn, E. and others, “Long-term macroeconomic effects of climate change: a cross-country analysis”, *NBER Working Papers*, No. 26167, National Bureau of Economic Research, August 2019.

Estimates from various studies for 2021 indicate an increase of between 2 million and 16.7 million people living in poverty and between 1.1 and 9.6 million people in extreme poverty as a result of climate change (see figure III.14). If a poverty line were assigned to this group,¹⁰ the cost of increased poverty would range between US\$ 3 billion and US\$ 28 billion.

F. Social spending: recent boost and challenges for continuity

In section B of this chapter, it was noted that dual or strongly segmented labour markets jeopardize access to social security for informal workers, who represent a significant portion of the labour force.¹¹ Although this is an important factor in accounting for the high levels of inequality in the region, it is not the only one. Latin America and the Caribbean is marked by a weak institutional framework for the promotion and protection of decent work, insufficient distributive policies, and social protection systems that are segmented, with gaps in coverage and sufficiency.

In Latin America and the Caribbean, the welfare state —and the social policies associated with it— have been either non-existent or truncated. Large sectors of the population have been excluded from access to education, health, security and justice. The absence of a welfare state or a truncated welfare state reflects a political economy constructed around the concentration of political and economic power in a small elite, whose profits are often based on rents from natural resources, cheap labour or privileged access to political power. A truncated welfare state is the manifestation in State institutions of a culture of privilege, whose effects are seen in the levels and distribution of social spending and in its long-term sustainability.

¹⁰ Approximately US\$ 140 per month.

¹¹ As Martínez Franzoni and Sánchez-Ancochea (2021, p. 295) point out: “Based on a Bismarckian blueprint, social policy during most of the twentieth century primarily benefited formal workers and their families in the context of highly informal labor markets. Latin America’s truncated social policy regime led to high levels of segmentation: different occupational groups received different benefits, while a wide gap between included formal and informal workers emerged [...]. Many citizens were unfortunately excluded from the social provision, particularly in the poorest countries.”

In 2020, the COVID-19 pandemic had significant economic and social impacts in the countries of Latin America and the Caribbean. To address these harmful effects, countries implemented direct health-care and containment measures, as well as social protection measures to address the social and economic impacts of lockdowns, such as monetary and in-kind transfers, grants and service charge suspensions, among others. While these actions illustrated the countries' response capacity, they also revealed their institutional constraints in taking preventive and comprehensive action, both in terms of social protection and across the various sectors.

This section analyses the significant increase in public social spending over this period, as this is a key indicator for measuring the scale of the public policy response to the crisis caused by the pandemic.¹²

1. Evolution of social spending and the importance and impact of transfers during the crisis

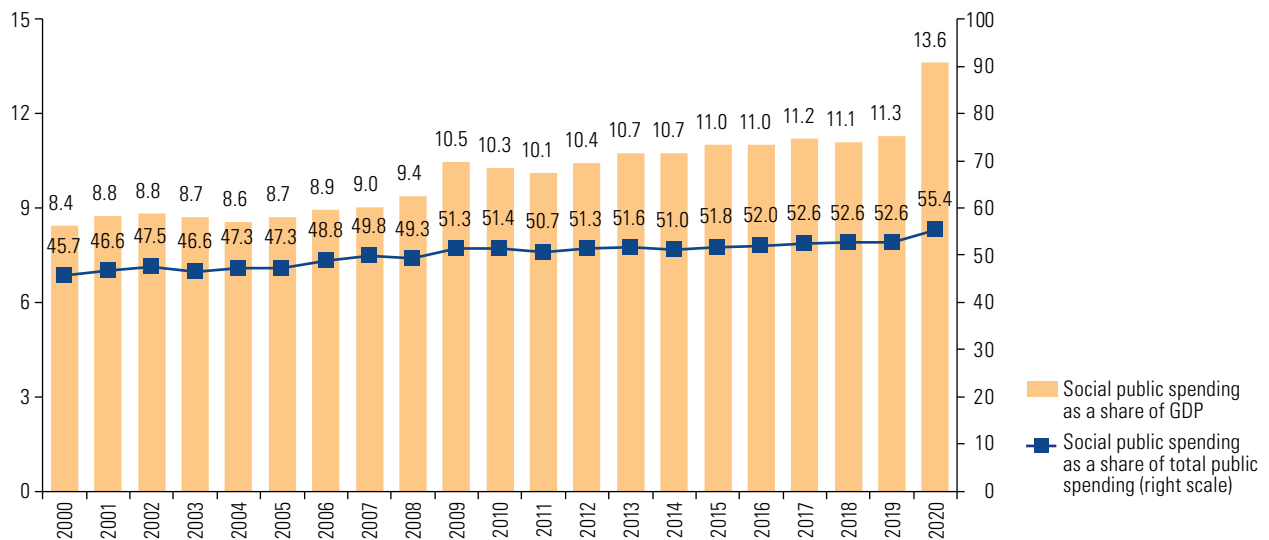
During the first two decades of the millennium, public social spending by the central governments of the region grew in a relatively stable manner in relation to GDP (see figure III.15).

As shown in figure III.15, there was a significant increase in public spending in Latin America at two moments, each marked by crises: after the 2008 global financial crisis (when spending for the following year increased by 0.9 points), and during the onset of the COVID-19 pandemic (when social spending for 2020 increased by 2.3 GDP percentage points compared to 2019). Social spending in 2020, at 13.6%, hit an all-time high, owing to both total social spending increases and falling annual GDP growth rates in the countries of the region over that period.

Social spending as a share of total central government public spending has also increased over time. During the pandemic, social spending as a share of total public spending went from 52.6% in 2019 to 55.4% in 2020, becoming its largest line item. Similarly, social spending represented 75% of all public spending increases, reflecting once again its prioritization in public spending allocation over recent years (ECLAC, 2021b).

Figure III.15

Latin America (17 countries): central government social spending, 2000–2020^a
(Percentages of GDP and of total public spending)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official information from the countries.

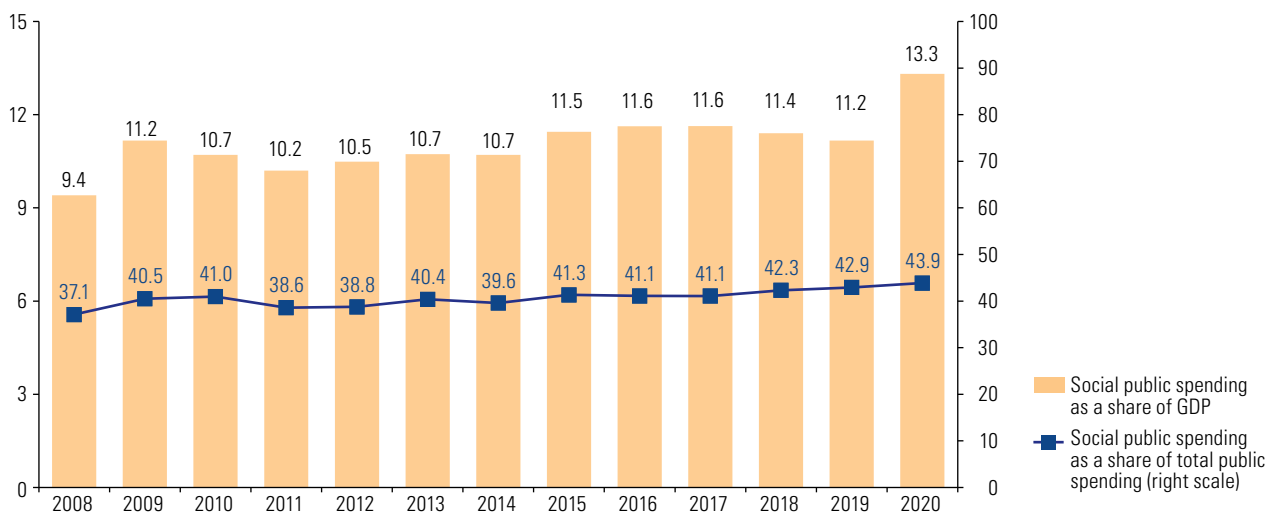
^a The figures shown correspond to the arithmetic mean for 17 Latin American countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Plurinational State of Bolivia and Uruguay. Coverage in the Plurinational State of Bolivia corresponds to the central administration, and in Peru, to general government. The most recent data available for Panama are from 2017.

¹² The data used to analyse social public spending in Latin America and the Caribbean were obtained from the official data published by each country on public spending and compiled each year by ECLAC in CEPALSTAT and in the Database on Social Investment in Latin America and the Caribbean of ECLAC. For more detailed information on the coverage and measurement methodology used for these results, see chapter III of Social Panorama of Latin America, 2021 (ECLAC, 2022a).

In the Caribbean, a similar trend was seen in calculations for the period between 2008 and 2020 for the Bahamas, Barbados, Guyana, Jamaica and Trinidad and Tobago. Average social spending in 2009 was up significantly, although it subsequently fell until 2011; levels then recovered until 2017, and dropped again slightly over the next two years (see figure III.16). Social spending went from 11.2% of GDP in 2019 to 13.3% in 2020, an increase that was similar to that seen in the countries of Latin America.

Figure III.16

The English-speaking Caribbean (5 countries): central government social spending, 2008–2020^a
(Percentages of GDP and of total public spending)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official information from the countries.

^a The averages correspond to the arithmetic mean of the values for five Caribbean countries: Bahamas, Barbados, French Guiana, Jamaica and Trinidad and Tobago.

Unlike social spending as a share of public spending in the countries of Latin America, in the Caribbean, such spending increased by just one percentage point between 2019 and 2020. The gap between the Caribbean and Latin America in that regard is 11 percentage points. In some countries, this is attributable to the high burden of interest payments and not necessarily to fiscal policy initiatives. This is particularly evident in the case of Jamaica.

An analysis of the distribution of central government spending by social function shows that, on average, the spending structure in 2020 resembled that of previous years.¹³ In Latin America, not only were social protection and health still the social functions with the highest spending, they also reached all-time highs, both in dollar terms and as percentages of GDP, with averages equivalent to 5.9% and 2.7% of GDP, respectively. Compared to 2020, the increase in average social spending for social protection was 1.7% of GDP, while health spending increased by 0.4 percentage points of GDP on average. These variations reflect governments prioritizing resource use for the pandemic crisis response, mainly for health and socioeconomic impacts on households.

Regarding increased spending for social protection, this includes resources for financing policies and programmes aimed at providing coverage for risk of loss of income or increased expenses affecting some or all of the population, related to illness, old age, caregiving, disasters, economic and social crises and unemployment, as well as those to facilitate the inclusion of the population and protection from poverty and inequality. The countries of Latin America and the Caribbean that allocate the highest proportion of GDP to this function are Brazil and Argentina (17.5% and 14.3%, respectively), followed by Chile (8.2%) and Uruguay (7.7%). In contrast, Honduras and Nicaragua allocate the lowest amount to this function (less than 1% of GDP).

¹³ Six social functions are considered: social protection; health; education; housing and basic services; recreation, culture and religion; and environmental protection. The Classification of the Functions of Government (COFOG) is used, based on the *Government Finance Statistics Manual* (IMF, 2001 and 2014).

The health function also includes disbursements made to finance services provided to individuals and groups at different levels of care, in both preventive and curative programmes. To cope with the health care crisis resulting from COVID-19, health spending increased significantly, mainly owing to the increased demand for services. In terms of central government spending, Chile allocated 6% of GDP to finance health expenditures, followed by Barbados and Guyana (4.3%), Jamaica (4.2%) and Nicaragua (4.1%). For countries with broader coverage, Argentina (7%),¹⁴ Brazil (6.3%) and Cuba (10.7%)¹⁵ exceeded the goal of 6% of GDP proposed by PAHO, followed by Costa Rica (5.7%). The countries where social spending on health increased in relation to GDP in 2020 were Barbados (1.43 percentage points), Guyana (1.17 points), the Bahamas (1.06 points), Peru (0.99 points) and Chile (0.87 points).

2. Emergency transfers: the challenge of sustainability

One important component of central government spending during the pandemic has been non-contributory social protection spending in response to the crisis and its economic and social repercussions. In 2021, the countries of the region continued to invest in non-contributory social protection measures in response to the social crisis caused by the COVID-19 pandemic, although to a lesser extent than in 2020. Specifically, total spending commitments announced by Latin American countries between January and December 2021 amounted to US\$ 45,271 million (approximately 34% of total spending since the beginning of the pandemic).

If the downward trend in non-contributory spending for social protection is maintained, spending in 2022 in the region is expected to be around half of what was spent in 2021. Although the average value of this spending as a share of each country's GDP would exceed conditional transfer programme and social pension funding disbursed in 2019, the contraction will entail a significant decrease in the capacity to afford social protection to the households most affected by the crisis, while the pandemic and the uncertainty it brings persist.

In line with the above, emergency income transfers were also a key measure to contain the increase in poverty and inequality caused by the COVID-19 pandemic. The socioeconomic situation of households deteriorated because of plummeting income from labour and productive activities, which was partially offset by income transfer programmes rolled out in 2020 by some countries in the region. In that regard, ECLAC estimated that, in the absence of such measures, extreme poverty and poverty would have increased by 1.8 and 2.9 percentage points, respectively, over 2019 levels. Calculating estimates for those countries was possible because their household surveys included questions on income received through transfer programmes. Despite this assistance, the increase in poverty caused significant setbacks in the region, pushing the number of people living in poverty above 200 million for the first time in 10 years.

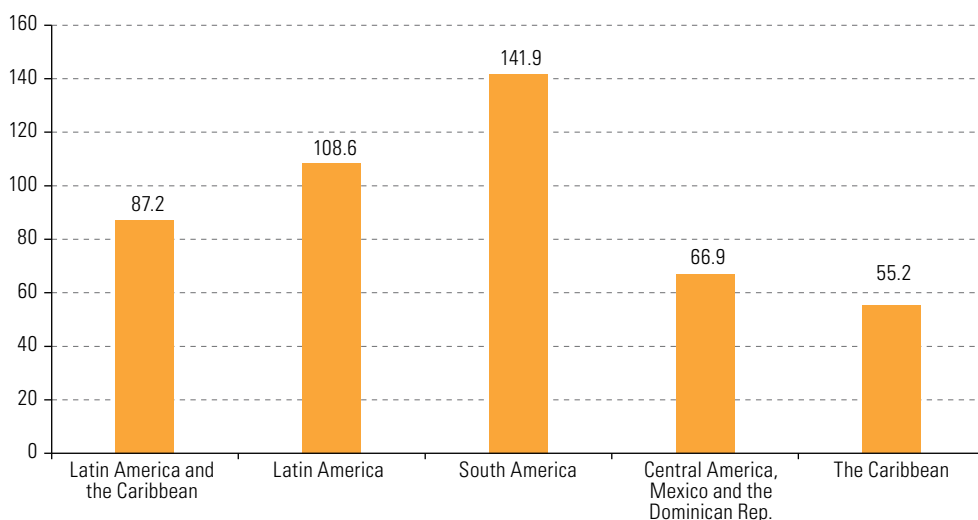
Average emergency transfer spending varied across the different countries and subregions of Latin America and the Caribbean. As of December 2021, the region had disbursed US\$ 87.2 current dollars, on average, per capita. This amount is higher if only Latin America is taken into account, where it amounts to US\$ 108.6 on average, reaching as much as US\$ 141.9 per capita in South America. The subregions with the lowest spending on emergency transfers are Central America, Mexico and the Dominican Republic, at US\$ 66.9, and the Caribbean, with average spending of US\$ 55.2 in current dollars over the same year (see figure III.17).

¹⁴ Information for 2017.

¹⁵ Information for 2019.

Figure III.17

Latin America and the Caribbean (30 countries): estimated average per capita expenditure on emergency cash and in-kind transfers, January–December 2021^a
(Dollars at current prices)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of ECLAC, COVID-19 Observatory in Latin America and the Caribbean [online] <https://www.cepal.org/en/subtopics/covid-19>; ECLAC, “Social Development and COVID-19 in Latin America and the Caribbean” [online] <https://dds.cepal.org/observatorio/socialcovid19/en/>; data from the International Monetary Fund (IMF) and the Central Bank of Venezuela, and official information from the countries.

^a Includes measures announced between 1 March 2020 and 31 October 2021. The 30 Latin American and Caribbean countries for which information is available on emergency transfers to tackle COVID-19 in 2021 are divided into two groups: 18 Latin American countries and 12 Caribbean countries (Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadine, Suriname and Trinidad and Tobago). The Latin American countries are divided into two subgroups: 10 South American countries (Argentina, Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Plurinational State of Bolivia and Uruguay) and 8 in the group comprising Central America (Costa Rica, Cuba, El Salvador, Guatemala, Honduras and Panama, Dominican Republic and Mexico).

Analysing variations in the sources of income of low-income households in all countries in the region shows that, with the exception of Brazil, public and private transfers made in 2020 were not sufficient to prevent a drop in household income compared to the previous year (ECLAC, 2022a, p. 67).

Employment is another area that has suffered significant impacts since the onset of the pandemic. Countries have implemented a series of labour policies aimed at combating unemployment and labour force outflows and have implemented measures to respond to broader issues, such as the participation of women in the labour force. In particular, average public spending on labour policies reached 0.9% of GDP in 2020, three times more than before the pandemic (ECLAC, 2022c).¹⁶ In general, all countries spent more on labour policies in 2020, with the Dominican Republic and Paraguay seeing the most notable increases. Spending was highest in programmes aimed at protecting income because of unemployment (from 0.09% to 0.55% of GDP), which accounted for more than 60% of labour policy spending in seven countries. Lastly, spending on labour incentives grew from 0.01% of GDP to 0.13%, and in four countries, more than 40% of spending was allocated to labour policies. Despite the efforts made across the region to increase spending on labour policies, spending levels in Latin America and the Caribbean remain well below levels in other regions of the world, such as the European Union, where 1.6% of GDP is allocated, compared with local spending of 0.9%.

The above summarizes the response capacity in terms of the economic resources allocated by social policy institutions to deal with the crisis during the pandemic, reflecting a significant increase in public social spending by central governments. However, financial sustainability remains a challenge if the coverage and quality of these policies are to be extended over time, with a view to universalizing access to social protection and building true welfare states.

¹⁶ This is the average for 15 countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru and Uruguay.

Concluding remarks

Chapter II discussed the importance of the production structure for economic growth and for countries' resilience to various kinds of shocks. The present chapter looked at the distributive impacts of those structures, which are either amplified or mitigated by the redistributive and social policies that countries adopt, whether through progressive tax regimes, cash transfers or the provision of goods and services to the most vulnerable sectors.

It has been shown that more complex productive structures (those that are more diversified and technology-intensive) are associated with higher employment rates. This is because higher economic growth drives demand for labour and strengthens the bargaining power of workers. Structural change creates decent jobs and is a mechanism that should be used to absorb labour informality and underemployment in Latin America and the Caribbean. The extremely high levels of informality in the region are the counterpart of a persistent specialization pattern of high dependence on natural resources and cheap labour. The inequalities associated with that pattern are aggravated by other, interrelated inequalities of gender, race, ethnicity or geographic region.

Leveraging the benefits of growth will require social policies and the construction of a welfare state. The two policies are mutually supportive. Uneven and extremely fragmented production and labour structures with a significant proportion of informality also generate piecemeal and fragmented social protection systems. Although countries attempted to cushion the effects of the pandemic on poverty and unemployment by applying social policies that relied more on public spending, there is no guarantee that such policies will be maintained. The pandemic imparted important lessons on the role of social policies in increasing economic resilience and the capacity for recovery from shocks. This potential should be consolidated by strengthening State institutions and enhancing transparency and coordination with the private sector. Public policy has yet to fully assume the challenge of transitioning towards systems with universal access to certain goods and services that are key to well-being and increasing productivity (for example, health and education). This transition is the necessary complement to the issues of productivity and international competitiveness in sustainable development policies, as discussed in chapter V.

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Annex III.A1

Box III.A1.1

Employment, productivity and structural heterogeneity: transforming production

The relationship between structural change and employment can be described simply in three panel exercise, as shown below: panel A shows the relationship between the specialization pattern and growth; panel B shows the relationship between growth and structural heterogeneity (the presence of subsistence employment and informality in the job market); and panel C shows the wage curve, which links the employment rate with wage levels.

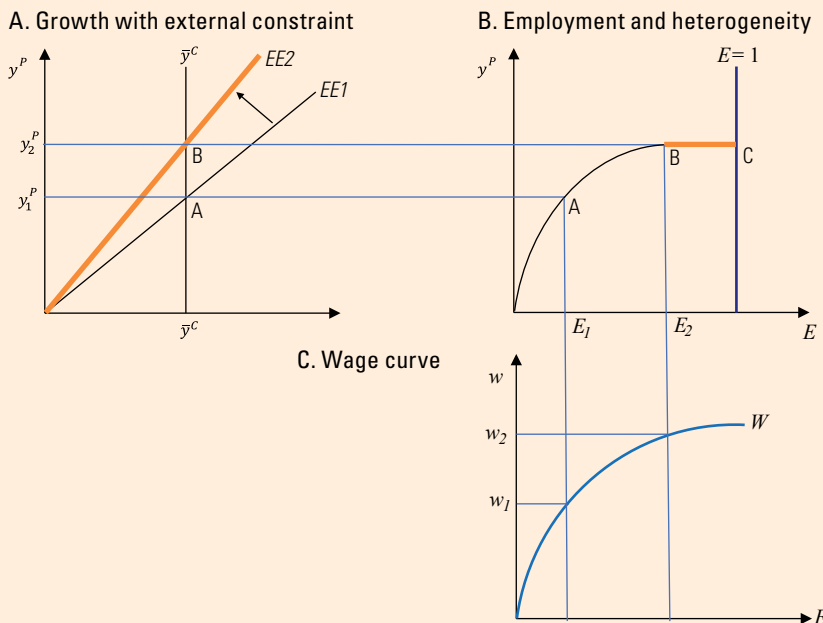
Initially, the growth rate that is in external equilibrium with the periphery (y_1^P) sits at point A, which shows the equivalence $y_1^P = (\varepsilon_1/\pi)\bar{y}^C$, where ε_1 is the income elasticity of export demand; π is the income elasticity of import demand; and \bar{y}^C is the exogenous growth rate of the centre. The relationship between the elasticities depends on the specialization pattern, as discussed in chapter II.

A virtuous circle of job growth may be expressed as follows: (i) the periphery increases its spending on research and development (R&D) and promotes a process of export diversification towards more dynamic sectors, producing movement from point A towards point B in the panel on the right side of figure 1; (ii) higher demand for labour enables an increase in formal labour participation in the economy, represented by E = formal employment/total workers. The figure assumes that the specialization pattern does not permit the absorption of all workers into the formal sector, which is achieved only when $E = 1$. The horizontal line between A and B represents the level of "structural heterogeneity" in Latin America.

The panel on the lower right of figure 1 shows the wage curve (W). Wages rise in response to a rise in the formal sector employment rate. These jobs allow workers greater enjoyment of rights and lead to better productivity. A higher employment rate also strengthens workers' bargaining power. Lastly, jobs with the highest productivity require workers with higher levels of formal education, who have greater capacity to organize and pressure employers for higher wages. As a result, movement from $EE1$ to $EE2$ entails an increase in the real wage in the economy from w_1 to w_2 along the wage curve W . For an analysis of the factors that explain the wage curve, see Blanchflower and Oswald (1995).

Figure 1

Production structure, employment and distribution



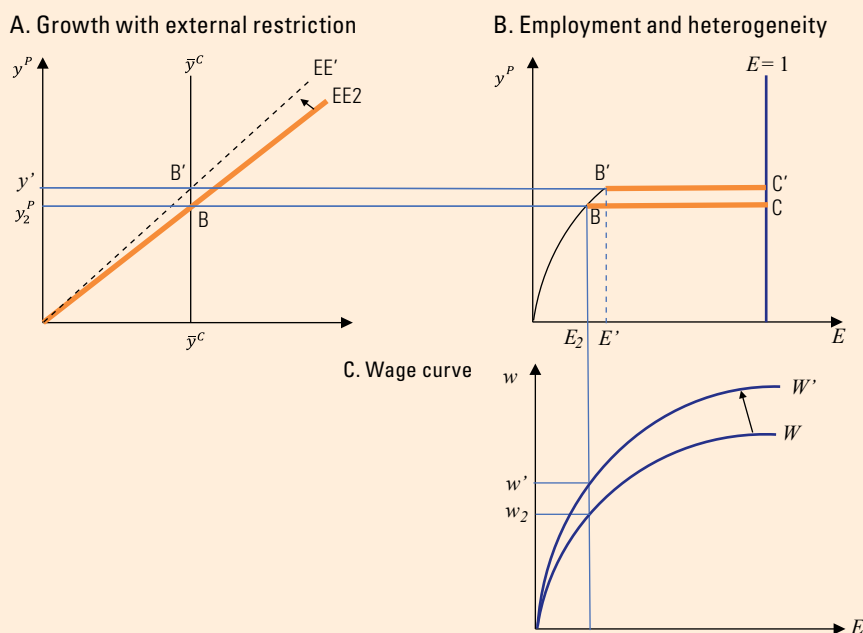
Source: G. Porcile and J. E. Alatorre, "New Directions in Latin American Structuralism", paper presented at the 26th Conference for the Forum for Macroeconomics and Macroeconomic Policies (FMM), Berlin, October 2022.

Note: $EE1$: $y_1^P = (\varepsilon_1/\pi)\bar{y}^C$; $EE2$: $y_2^P = (\varepsilon_2/\pi)\bar{y}^C$; y : economic growth rates; α : share of wages in the GDP of the periphery; C: centre; P: periphery. A: growth without structural change; B: growth with structural change in the periphery. The distance from B to C represents underemployment in the periphery.

One final point that is worth noting is the feedback loops between wages and productivity. The equation of Sylos Labini (1993) (see the note for figure 2) suggests that higher real wages can accelerate technical progress and reduce the cost of labour or promote organizational changes for that purpose. In addition, as consumption demand increases, wage increases can stimulate aggregate demand, increasing profit expectations, which fosters investment (Fontanari and Palumbo, 2022; Storm and Naastepad, 2012). The lower panel shows the effect of higher real wages stemming from institutional change that improves workers' bargaining power.

Figure 2

Positive effects of distributive policies on capacity: the Sylos Labini equation



Source: G. Porcile and J. E. Alatorre, "New Directions in Latin American Structuralism", paper presented at the 26th Conference for the Forum for Macroeconomics and Macroeconomic Policies (FMM), Berlin, October 2022.

Note: The movement of $EE2$ towards EE' and B' represents the impact on competitiveness of technical progress driven by institutional change that fosters the bargaining power of workers (from W to W'). This movement is the result of an increase in real wages from w_2 to w' , which leads to an increase in productivity $\Delta\pi$, as posited by the Sylos Labini equation: $\Delta\pi = \alpha + \alpha \Delta Y_t + b\Delta(W/P)_t + c\Delta(W/Pm)_{t-n}$, where W/P is the real cost of labour and W/Pm is the ratio between cost of labour and cost of machinery (Pm), with time lag $t-n$.

In figure 2, the wage curve moves upward, from W to W' , such that wages are higher with every change in the employment rate (the new wage level is W'). This incentivizes innovation, which could partially offset the negative effects of wage increases on competitiveness. In the figure, it is a given that the positive effect of wages on technical progress is strong enough to drive an increase in international competitiveness. Curve EE rises, from $EE2$ to EE' and from B to B' , as employment rises, up to E' , where informal employment falls, which now becomes segment $B'C'$ instead of BC . In the last example, the causal link is the result of an improvement in distribution towards technical progress and structural change. It is important to emphasize that this effect is not automatic and it has limits; in particular, science, technology and education policies are needed to make innovation a viable response to higher wage costs. In the absence of this factor, the cost-of-wage factor will take precedence over the positive effect of innovation.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of G. Porcile and J. E. Alatorre, "New Directions in Latin American Structuralism", paper presented at the 26th Conference for the Forum for Macroeconomics and Macroeconomic Policies (FMM), Berlin, October 2022; D. G. Blanchflower and A. J. Oswald, "An introduction to the wage curve", *Journal of Economic Perspectives*, vol. 9, N° 3, 1995; P. Sylos Labini, *Progresso tecnico e sviluppo ciclico*, Bari, Laterza, 1993; C. Fontanari and A. Palumbo, "Permanent scars: the effects of wages on productivity", *Working Paper*, N° 187, Institute for New Economic Thinking (INET), July 2022; and S. Storm and C. W. M. Naastepad, *Macroeconomics beyond the NAIRU*, Cambridge, Harvard University Press, 2012.



CHAPTER IV

Sectoral considerations: drivers of sustainable development

Introduction

- A. The energy transition to tackle the environmental and geopolitical crisis
- B. Opportunities in the growing e-mobility market
- C. The circular economy: a cross-sector strategy
- D. The bioeconomy: sustainable agriculture, genetic resources and bio-industrialization
- E. Health-care manufacturing industry: progress towards self-sufficiency in health matters
- F. Digital transformation
- G. The care economy: creating jobs with equality
- H. Sustainable tourism for job creation
- I. Harnessing the potential of MSMEs and the social and solidarity economy
- J. Conclusions: towards industrial policies with sectoral and cross-cutting actions

Bibliography

Introduction

Since 2016, the Economic Commission for Latin America and the Caribbean (ECLAC) has encouraged the countries of the region to follow a strong, investment-driven strategy for structural change to foster sustainable and inclusive development. Sectoral considerations are crucial in this progressively developing strategy for their role in defining business strategy, business models, capital formation and job creation (ECLAC, 2016, 2018, 2020a and 2021h). Proposals made in this chapter aim to make progress in sectoral considerations in nine areas of activity in the region.¹ Renewable and clean energy, e-mobility, the circular economy, the bioeconomy, the health-care manufacturing industry and the digital economy are at the heart of the most advanced innovation processes worldwide. Meanwhile, the care economy, tourism, micro-, small and medium-sized enterprises (MSMEs) and the social and solidarity economy, which are based on more mature technologies, are sectors that have generated much employment, with its consequent positive effects on income and upward mobility for disadvantaged segments of society. This chapter centres its analyses on production and technology trends, and proposes policy guidelines to boost productivity, investment and positive impacts on social inclusion and sustainability to achieve the Sustainable Development Goals and the 2030 Agenda for Sustainable Development.

A. The energy transition to tackle the environmental and geopolitical crisis

1. The growing competitiveness of renewable and clean energy

Between 1970 and 2020, the primary energy supply in Latin America and the Caribbean more than doubled in size (2.4 times), from 2.280 to 5.140 billion barrels of oil equivalent. Renewables grew even faster, accounting for 25% of the total in 1971 and 33.6% in 2020, an increase tempered by the pandemic-fuelled slowdown in economic activity and regional energy supply.²

In 2020, fossil fuels accounted for 66% of the region's primary energy supply,³ creating vulnerabilities to global fuel price shocks and aggravating greenhouse gas emissions and pollution. Meanwhile, 61% of the region's electricity came from renewable energy sources (75% hydroelectricity and 25% solar, wind, biomass and geothermal), with significant variation from one country to another.⁴

Several Caribbean economies have made progress in the adoption of renewable energies, increasing their installed capacity in these energies by 98% between 2014 and 2021. The share of solar energy, bioenergy and hydroelectricity in total renewable energy capacity came to 34%, 26% and 25%, respectively, in 2021 (IRENA, 2021a).⁵ As a result, in the Caribbean, electricity generated from renewable sources reflected a 116% jump in wind energy and 130% in solar energy between 2017 and 2020 (OLADE, 2022).

In the past three decades, the region has achieved efficiency gains by decreasing energy intensity by 37.5%.⁶ Energy efficiency in economic activities, households and institutions has probably improved as a result of rising fossil fuel prices and technological progress. This increase in energy efficiency is pivotal

¹ The selection of sectors examined here is not exhaustive and is subject to change over time. Seven sectors are discussed in ECLAC (2020a) and the care economy was added in ECLAC (2021h). The present document also offers analysis and guidelines on MSMEs and the social and solidarity economy.

² Lockdowns drove down demand for electricity and fossil fuels in transportation, commerce and industry significantly. ECLAC estimates that this demand fell by 15%–25% in the region during lockdowns in 2020 and 2021.

³ The primary supply was supplemented by renewable energy including 9% from hydropower, 18.8% from biofuels such as firewood and bagasse, 5.1% from solar and wind energy, and 0.9% from geothermal energy.

⁴ In 2020, renewables generated 952 TWh of energy with an installed capacity of 274 GW. According to Latin American Energy Organization (OLADE) data, 11 GW of new renewable capacity was installed (53% solar energy and 31% wind).

⁵ Much of this growth was led by Antigua and Barbuda, Aruba, Barbados, the Dominican Republic, Jamaica, Saint Lucia, and Saint Kitts and Nevis. The Cayman Islands, Dominica and Saint Vincent and the Grenadines have made significant efforts to develop renewable geothermal and ocean energy sources.

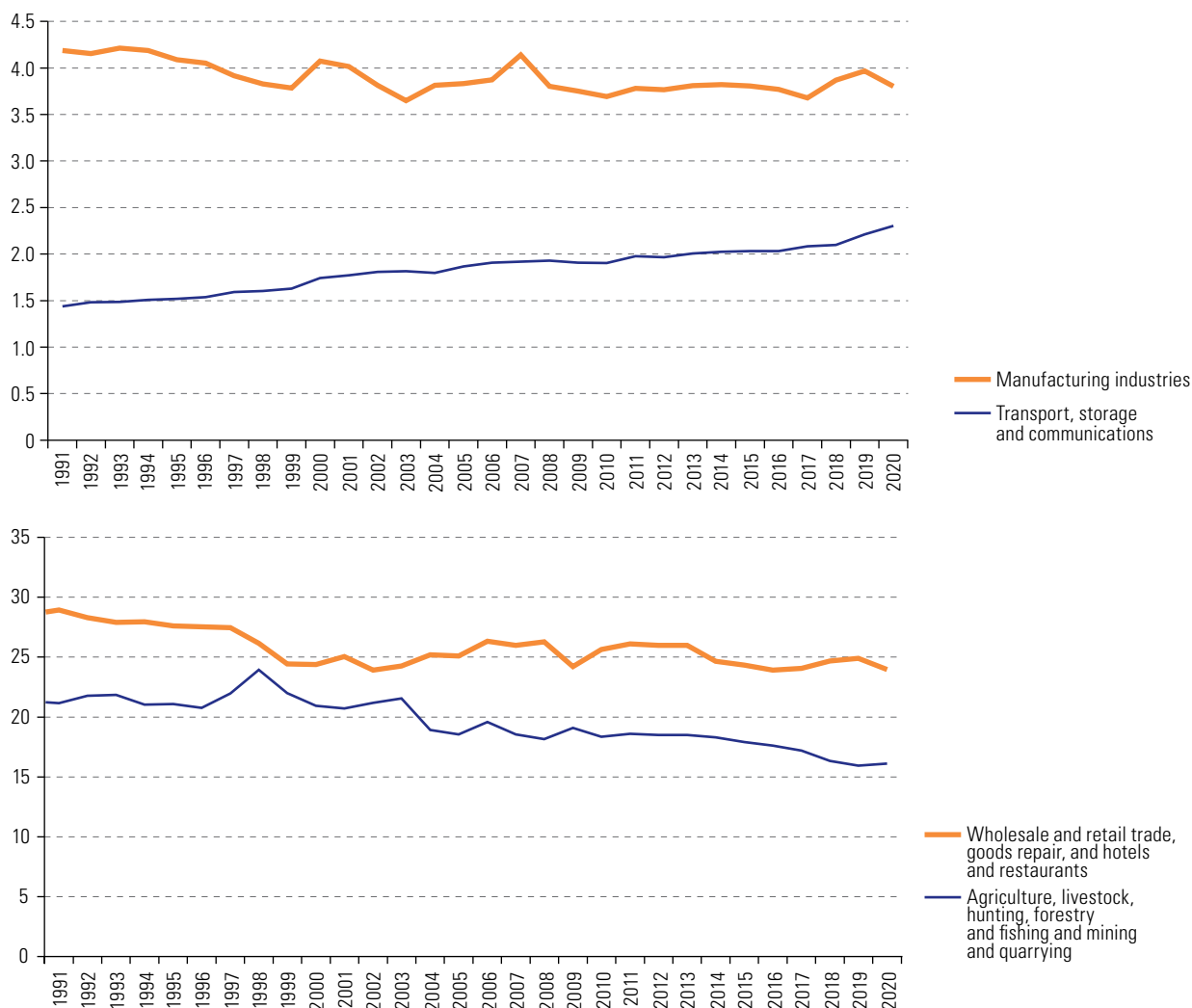
⁶ Energy intensity is measured as primary energy supply/regional GDP, on the basis of data from the Latin American Energy Organization (OLADE) (energy consumption) and ECLAC (sectoral value added).

in the transportation sector, which uses 40% of the region's primary energy supply. The manufacturing industry has improved efficiency somewhat, while agriculture and commerce have recorded a downward trend (see figure IV.1).

Figure IV.1

Latin America and the Caribbean: energy efficiency by sector, 1991–2020^a

(Constant dollars at 2018 prices/kilograms of oil equivalent (kgoe))



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of CEPALSTAT [online database] <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en> and Latin American Energy Organization (OLADE).

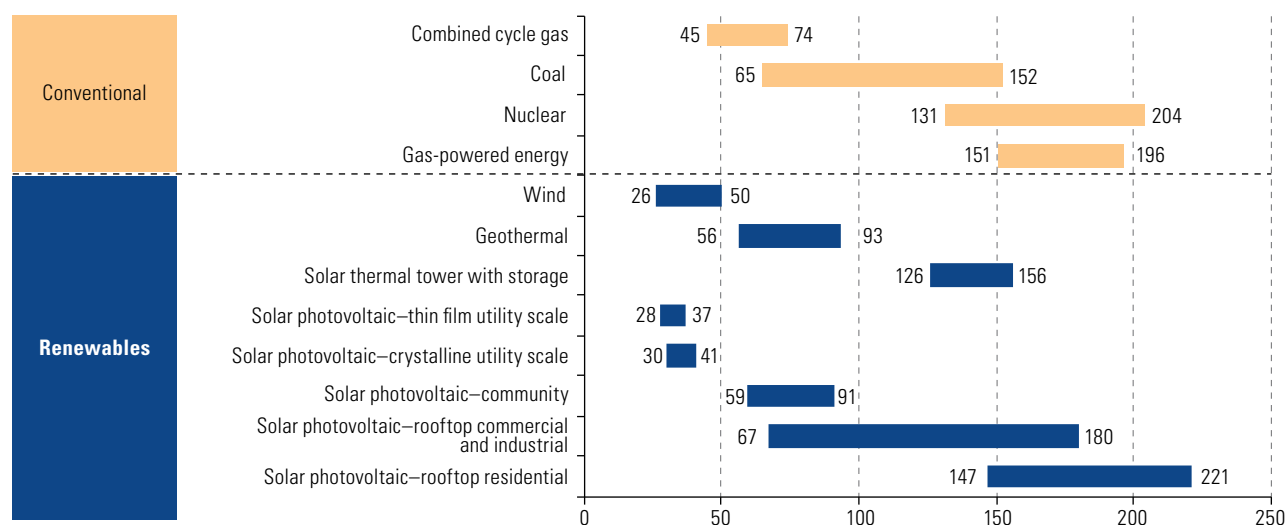
^a Gross value added, by sector/energy consumption, by sector.

The significant drop in the cost of renewable energy increases its competitiveness in the current context of rising hydrocarbon prices worldwide. Globally, over the past decade, the cost of wind energy has declined by more than half, while the cost of solar energy and batteries has plummeted 85% (Guterres, 2022). In fact, the current KW/h cost of electricity derived from renewables—particularly wind and solar photovoltaic energy—even without subsidies, is lower than that of energy sourced from coal and, to a lesser extent, from natural gas. These figures are determined by the scale of production, the technology used and the time of start-up—elements used to calculate the levelized cost of energy, which does not include subsidies. According to 2021 data, electricity derived from renewable wind and solar photovoltaic sources at plant scale are more competitive than electricity derived from non-renewable sources such as combined-cycle gas and coal (see figure IV.2).

Figure IV.2

Comparison of levelized costs of competitive renewable energy and of fossil fuels, 2021

(Range in dollars/megawatt-hours (MWh))



Source: Lazard, *Lazard's Levelized Cost of Energy Analysis: Version 15.0*, October 2021.

Note: The levelized cost of energy is expressed in ranges from minimum to maximum, as it varies from one country to the next, depending on the technology and the capacity factor of each power station.

In the region, the main barriers to a faster adoption of renewables and the energy transition are increasing pressure on infrastructure, lagging regulation and continued fossil fuel subsidies. Globally, it is estimated that every minute of every day, coal, oil and gas receive roughly \$US 11 million in subsidies. Each year, governments around the world pour around half a trillion dollars into artificially lowering the price of fossil fuels—more than triple what renewables receive (Guterres, 2022). Although relative prices that reflect the greater competitiveness of renewable energies are required, this is not enough to accelerate the transition. A new ecosystem is needed to accelerate the energy transition in the region.

With this in mind, ECLAC recommends the following public policies to accelerate an inclusive and sustainable energy transition:⁷

- **Investments** for sustainability, universal access to electricity and the creation of green jobs. ECLAC (2020a) showed how an annual investment equal to 1.3% of regional GDP over a decade would increase regional electrical integration and achieve 100% renewables-based electricity generation, with a 31.5% reduction in carbon dioxide (CO₂) emissions, and create seven million new green jobs, with the corresponding wage income.
- **Universal electrification**, leaving no one behind,⁸ based on the combined use of renewable technologies to offer local, decentralized electricity to off-grid rural communities.
- **Boosting demand for renewables**, as the market alone cannot direct investments to the adoption of renewables at the pace necessary for a paradigm shift in energy. Both supply and demand must be boosted to develop renewables. Induced demand stimulates supply through long-term national policies and strategies that include achievable targets with tools including regulations and economic instruments such as subsidies and incentives to producers, institutions and households, awareness-raising and training on energy efficiency and renewability, as well as choice architecture.

⁷ The energy transition includes: increasing the share of renewable sources in the energy mix, universalizing access to electricity and reducing energy poverty, improving energy efficiency, strengthening regional energy integration and interconnection, and increasing energy security and resilience in the face of external shocks.

⁸ At present, roughly 17 million people in the region lack electricity connections (OLADE, 2022).

- **Renewable energy value chains** as vectors for development and energy security. The region has the skilled human capital and critical raw materials required to foster renewables, including the production and storage needed to create value and develop value chains. More inputs, technology and know-how related to renewables within the region mean greater energy security and resilience in the face of global events.
- **Industrial policy action for renewables**, including support for the manufacturing of equipment, components and parts, as well as for engineering, maintenance and operation services for power plants using different types of technology. Promoting energy distribution creates specific challenges for installation and maintenance service sectors. Governments can support these initiatives by: (i) encouraging national and regional producers to bid in public tenders; (ii) implementing regulatory frameworks that ensure these firms greater market access; (iii) financing research and development (R&D) activities to increase competitiveness or adapt products to specific requirements and (iv) financing the scaling up of local or regional producers.
- **Financing** to accelerate energy transitions by overcoming inefficiencies in regulatory mechanisms and inaccurate risk perceptions. There is need of blended finance that provides the necessary structures to close existing funding gaps and unlock the trillions held by private actors. This means adjusted risk frameworks and more flexibility to scale up renewable finance.
- **Governance, participation and public-private cooperation** with greater citizen involvement from the project inception phase for greater decentralization and informed participation. The capacities and commitment of individuals, especially prosumers (producers and consumers) play a key role, highlighting the importance of access to smart and small-scale technology (Stephens, 2019).
- **Long-term planning and regional energy integration** to address global energy uncertainties, volatility and crises, and to establish a regional energy security system, by promoting and maintaining dialogue between policymakers, the private sector and stakeholders in each country and in the region.

The rise in fossil fuel prices and the technological advances that increase renewable energy competitiveness, as already seen, facilitate the implementation of these recommendations. The processes involving solar and wind technologies in the recent past are currently vigorously under way in the new green hydrogen industry and lithium mining, a crucial input for new storage options.

2. The nascent green hydrogen industry

A new industry is emerging with the potential to transform the energy matrix: green hydrogen (H₂), a source of energy that works as both a carrier and storage method, used in multiple applications, the production nor the consumption of which generates greenhouse gas emissions. Likewise, it can be used to power activities requiring a continuous, intensive energy supply (such as cement, steel and other heavy industries), as well as those for which the use of renewables is difficult or impossible, including cargo transportation, shipping and aviation.

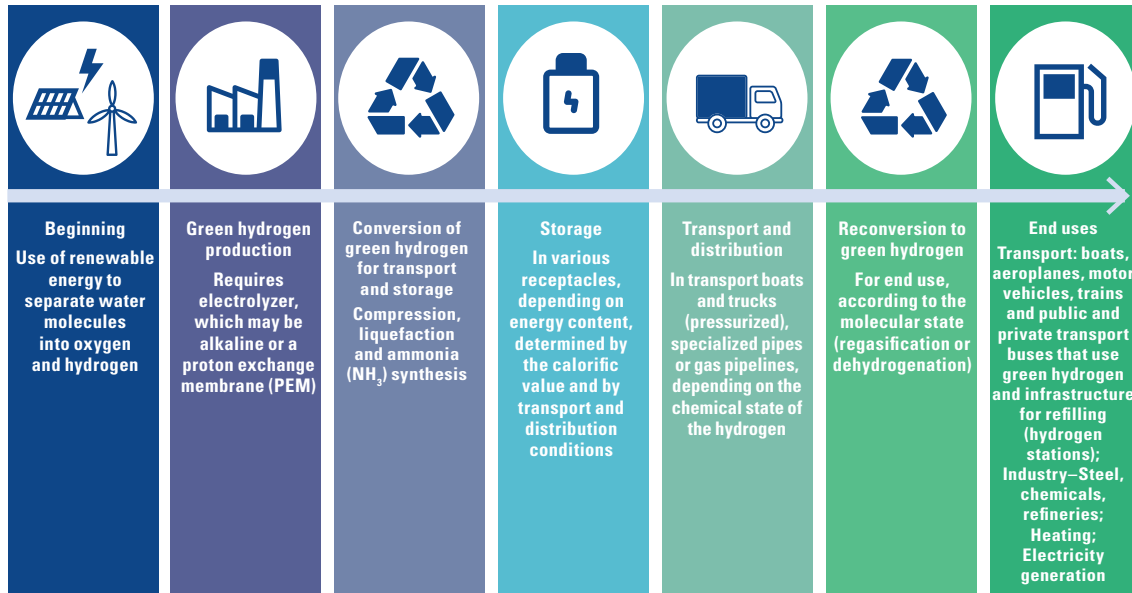
Green hydrogen is generated from renewable and clean energy sources such as solar, wind and hydroelectric energy.⁹ In the atmosphere, hydrogen is more accessible in water molecules (H₂O), which must be split using electrolysis to produce hydrogen. Green hydrogen can be produced at a decreased cost depending on technologies, project scale, and input and output prices. Although green hydrogen value chains are complex and multipurpose, they can generally be explained by the following sequence: (i) production, involving a given

⁹ Based on current technology (electrolysis) and efficiency levels of 60%–70%, it takes 50 kWh of renewables to produce one kilogram of green hydrogen.

type of electricity source, the technology to be used in production and the type of hydrogen (green or blue);¹⁰ (ii) conversion, (iii) storage, (iv) transportation (v) reconversion and (vi) applications or end uses in economic activities and sectors (see diagram IV.1).

Diagram IV.1

General sequence of green hydrogen value chain



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Renewable Energy Agency (IRENA), *Making the Breakthrough: Green Hydrogen Policies and Technology Costs*, Abu Dabi [online] https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Nov/IRENA_Green_Hydrogen_breakthrough_2021.pdf?la=en&hash=40FA5B8AD7AB1666EECBDE30EF458C45EE5A0AA6 and Asociación chilena del hidrógeno (H₂Chile) “Cadena de Valor” [online] <https://h2chile.cl/cadena-valor-aplicaciones/>.

Technological development and innovation to develop industries and an economy based on hydrogen in the countries of the region are crucial to increase value added and sustainable development. However, value chains will be specific for each production project and requirements for each type of end use must be considered. For example, green hydrogen may be used directly in a fuel cell, which may require distribution, storage and transport, but not necessarily conversion and reconversion. According to the end use requirements, in addition to the localization of the green hydrogen production plant and the transport requirements, the value chain will be shorter or longer; in other words, there will be a smaller or greater number of stages in the sequence from beginning to end.

Green hydrogen can be used to generate and distribute electricity on a grid or as energy concentrated in fuel cells similar to vehicle batteries, which have been refined for decades for use in industry, buses, trucks and various prototypes. Expanding green hydrogen production and use could accelerate the energy transition, potentially crucial to the transformation of production in all economic activity sectors due to its vertical and horizontal linkage potential.

This industry is booming at the global level. While only three countries had national green hydrogen strategies in 2019, in 2022, 17 governments had announced their own strategies and 20 more are developing them. By 2050, global green hydrogen production is set to increase more than sixfold,¹¹ account for 18%

¹⁰ Blue hydrogen is made using fossil fuels but with carbon capture and storage.

¹¹ Global supply volumes are expected to grow from 84 metric tons (Mt) in 2019 (consumed mainly by the chemical industry and refineries) to 177 Mt in 2035 and 562 Mt in 2050, consumed predominantly by the chemical, aviation, shipping and road transport sectors and by new industrial processes (McKinsey & Company, 2022).

of final energy demand, remove 6 gigatons of carbon dioxide equivalent (CO₂-eq) annually (20%–25% of all removed CO₂) and generate US\$ 2.5 billion in annual sales and 300 million green jobs (Hydrogen Council, 2017).

Latin America and the Caribbean produce 5% of the world's grey hydrogen (from natural gas via steam methane reformation), which is used as feedstock in the production of ammonia, methanol and steel, and in refineries.¹² About 90% of regional hydrogen demand is concentrated in Argentina, Brazil, Chile, Colombia, Mexico and Trinidad and Tobago.

The green hydrogen industry is booming in certain countries in the region, albeit without commercial-scale production as of yet. In pilot-scale projects, green hydrogen is mainly used in bus, long-haul trucking and marine transportation, energy grid injection and mining (mainly to replace the diesel used in trucks in Chile's large-scale mining industry). Hydrogen is a versatile energy source that each country can adapt to its objectives and priorities for energy transition and decarbonization, and can use for its strategic advantages. Each country has competitive advantages for certain uses of green hydrogen. Likewise, the existence of complementary industries in other countries in the region enhances synergies, economies of scale and subregional and regional electricity integration. Situations vary across the region:

- In countries like Brazil where bioenergy is widely used, green or blue hydrogen could be used to produce synthetic fuels.
- In Chile, green hydrogen could be used in heavy transport and operations and in thermal or electric operational processes in mining, which account for 25% of all diesel consumption in the country.
- Costa Rica, Paraguay and Uruguay, which have almost completely decarbonized their electricity systems, are focusing on the use of green hydrogen in transportation and e-mobility in their continuing transition to clean energy.
- Due to its strategic location and role in international shipping, Panama could become a regional hub for the distribution and trade of green hydrogen.
- Trinidad and Tobago is already a major producer of grey hydrogen and one of the largest exporters of methanol and ammonia. The country could adapt its infrastructure to produce green rather than grey hydrogen.

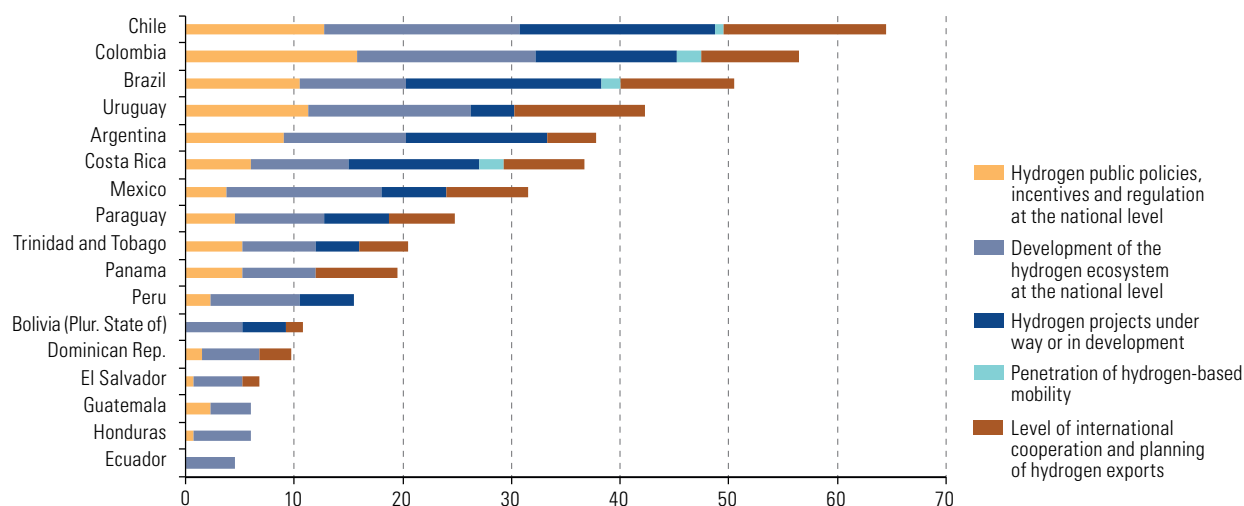
Figure IV.3 presents a green hydrogen industry development index for 2022 based on five parameters and identifies Chile, Colombia, Brazil, Uruguay, Argentina, Costa Rica and Mexico as the most advanced countries in the region in that regard. In particular, Chile, which launched a National Green Hydrogen Strategy in 2020, could hold a strategic position with green hydrogen production that could reach 160 million tons per year. Table IV.1 shows that in August 2022, at least 12 green hydrogen projects were under way in the region (in Argentina, Brazil, Chile, Colombia, Costa Rica and Peru) and 71 projects were in development in the same countries, in addition to Mexico, Paraguay, the Plurinational State of Bolivia and Uruguay.

¹² In 2021, 5% of the world's hydrogen was produced from fossil fuels.

Figure IV.3

Latin America and the Caribbean (17 countries): green hydrogen industry development index, 2022

(Range: 1 to 100)

**Source:** Hincio S.A./New Energy, "H₂ LAC Index 2022", September 2022.**Note:** 100 corresponds to a fully developed industry in a country. Only includes countries of the region for which data are available.**Table IV.1**

Latin America (10 countries): green hydrogen pilot projects under way or in development, 2022

Country	Projects under way		Projects in development
	Name of Project or company	Application or uses of project under way	Number of projects in development (additional)
Argentina	Hychico, Comodoro Rivadavia	Injection into natural gas grids, electricity generation	6
Brazil	Fuel cell buses for urban transport	Injection into natural gas grid, mobility, electricity generation	19
	FURNAS and Base Energia Sustentável	Electricity generation	
	Companhia Energética de São Paulo (CESP) and Base Energia Sustentável (2020–2022)	Injection into natural gas grid, electricity generation	
Bolivia (Plurinational State of)	...	...	1
Chile	Las Tórtolas project by Anglo American	Mobility, mining	25
	Green hydrogen for forklifts by Walmart	Mobility	
	Enel, microgrids Cerro Pabellón	Electricity generation	
Colombia	Ecopetrol - Toyota Mirai pilot project	Industrial raw materials, mobility	9
	Promigas pilot project	Injection into natural gas grid	
Costa Rica	Experimental green hydrogen plant - Ad Astra Rocket Company	Electricity generation	1
	Mobility project for hydrogen charging station and fuel cell bus - Ad Astra Rocket Company	Mobility	
Mexico	...	...	4
Paraguay	...	...	4
Peru	Industrias Cachimayo	Industrial raw materials	...
Uruguay	...	...	2
Total		12	71

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Green hydrogen is key to ensuring the continuity and use of hydrocarbon industry infrastructure. Producing hydrogen from natural gas is a short- and medium-term solution to take production technology to the next level: renewables-based green hydrogen. The war between the Russian Federation and Ukraine has intensified the need for cooperation and integration among the countries of the region to establish a hydrogen hub and lead the development of a regional and international market that can strengthen local economies and green jobs and generate new revenues needed for the energy transition.

There is enormous long-term potential in Latin America and the Caribbean to produce low-cost green hydrogen (at an estimated levelized cost of less than US\$ 1/kg of hydrogen) using a hybrid wind and solar photovoltaic system to obtain a higher capacity factor and greater efficiency. Given the current market scale and taking Chile as a reference, hydrogen production costs range between US\$ 3.0/kg and US\$ 7.5/kg (Chile, Ministry of Energy, 2022). Although grey hydrogen can be produced in the region from natural gas at a lower cost (US\$ 0.9/kg to US\$ 3.2/kg), this type of production outsources environmental costs and generates greenhouse gases. Following the surge in hydrocarbon prices due to the war in Ukraine, relative prices made the renewables needed for the production of green hydrogen even more competitive—but this cost competitiveness is not enough. Local demand for hydrogen remains low in the region (5% of global demand), allowing broad growth, economies of scale and lower unit costs, thus also creating export potential for green hydrogen at internationally competitive costs.

Experts predict that green hydrogen prices could match those of fossil fuel-derived hydrogen within the 2030 decade, by stimulating demand through technical innovation and improved performance, the roll-out of technology such as higher-capacity electrolyzers to scale up global production and a steady decrease in the cost of renewable energy inputs.

The region must work now to ensure regional cooperation and integration in energy matters. It is essential to establish a regional dialogue on national policies and initiatives based on short-, medium- and long-term objectives and courses of action, in order to build reliable collaborative spaces at the local, national and regional levels, involving all stakeholders in the value chain. It is also imperative to stimulate demand and reduce barriers to this new industry, as well as update regulation so as to enable investments and operations. The main areas requiring short- and medium-term progress in the region are:

- Development of the entire green hydrogen value chain in the region, which is imperative and viable. At present, national plans and policies to develop green hydrogen are focused on the end of the value chain, which is a risk in terms of technological security and reliance on external markets.
- The higher production cost of green hydrogen (which depends on the cost of electricity derived from renewable sources) compared to fossil-fuel powered production.
- A need to simultaneously expand supply and demand to overcome coordination shortcomings.
- Affordable financing and public-private partnerships to drive pilot projects that should be ready to increase production significantly by 2030.
- Training of multidisciplinary human capital to accelerate the development of this industry and to scale projects in line with competitors.
- Collaboration between stakeholders on the value chain and in civil society.

The region could harness the potential of green hydrogen not only for the energy transition and the long-term decarbonization of its economies, but also to adopt a new form of fair and sustainable development. The challenge is to use green hydrogen as a vector of energy transition and sustainable development. Timely action is needed to develop this new industry and achieve carbon neutrality by 2050, which, in the short term, requires the implementation and prioritization of pilot projects to test existing technologies, and their adaptation to local characteristics. This initial development period would extend until 2030, followed by the scaling-up stage in the medium term to achieve full development of the industry by 2050.

3. Lithium in the energy transition

Lithium is a critical component in the electric batteries needed for the energy transition and particularly for e-mobility. Argentina, Chile and the Plurinational State of Bolivia, the countries of the “lithium triangle,” where

significant reserves of the element are found in salt flats, are very interested in its use as a raw material and its industrialization. There are also reserves of lithium in hard rock (pegmatites) in Brazil and in clay and rock (pegmatite) in Mexico. In April 2022, the Government of Mexico declared the exploration, exploitation and use of lithium of public interest. As a result, no new concessions would be granted and a decentralized State entity would be responsible for the exploration, exploitation, management and control of lithium value chains. In the region, production is concentrated in the salt flats of the countries of the lithium triangle and in Brazil, which produces lithium rock. The largest producer is Chile (24.3% of global production), followed by Argentina (5.8%) and Brazil (1.4%). The Plurinational State of Bolivia does not yet produce on an industrial scale and the most advanced projects in Mexico have still not reached the exploitation phase.

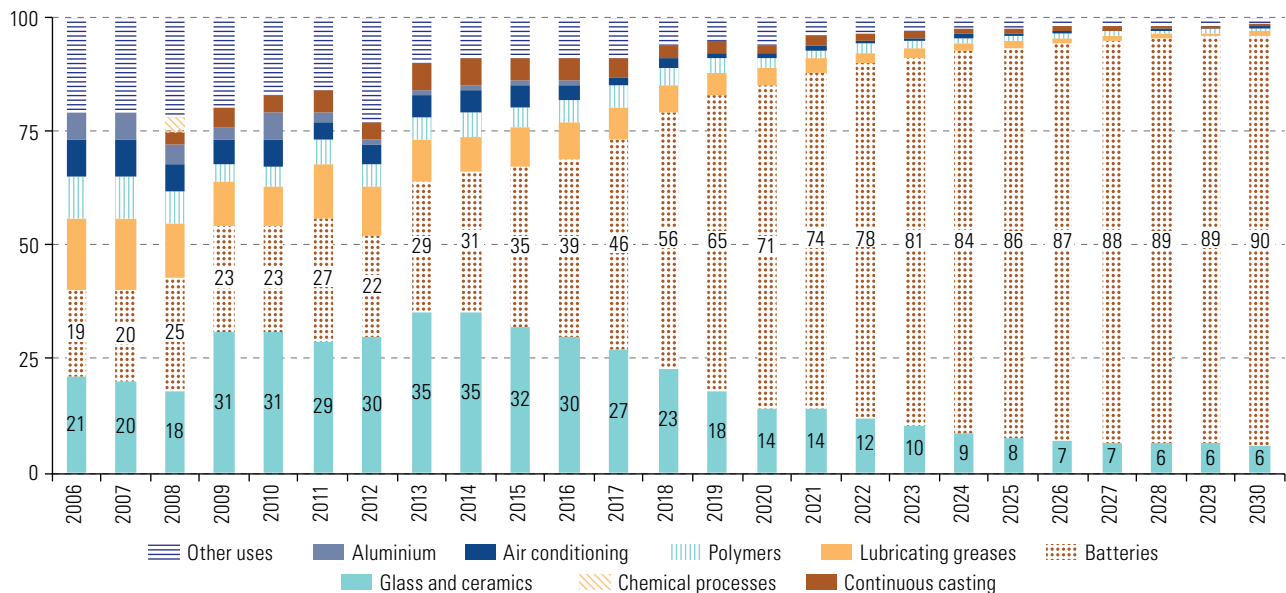
Based on the policies announced by countries, the International Energy Agency (IEA, 2021) projects that global lithium demand will grow at an annual average of 22.5% for 2020–2030 and 13.6% for 2020–2040. With 56.8% of the world's resources, 51.3% of the world's reserves and 31.4% of global mineral production (USGS, n/d), the region has a strategic advantage. The region is expected to increase its production capacity by 2.7 times in the next 10 years based on projects in the pipeline that are classified as probable, and by 5 times including projects classified as possible and speculative (Jones, Acuña and Rodríguez, 2021b).

The physicochemical characteristics of lithium make it a key resource for the energy transition and e-mobility. Lithium is a component of lithium-ion batteries. The physicochemical characteristics of lithium —it is the lightest metal with high electrochemical potential— mean that lithium-ion batteries outperform existing battery technologies on the market in terms of energy storage and recharging.

The advantages of lithium-ion batteries, especially their high energy density, have driven their status on the market, explained by the increased manufacturing capacity of lithium-ion battery cells in gigafactories. In 2015, 33 gigafactories operated with an average capacity of 1.8 GWh; by 2020, this number had risen to 77, with an average capacity of 6 GWh, and is projected to reach 107 by 2026, with an average capacity of 13.8 GWh — none of them in Latin America (Jones, Acuña and Rodríguez, 2021a). In 2020, lithium-ion batteries accounted for 71% of the demand for lithium (with 44% used in e-mobility applications); by 2030, this share could reach 90% (74% for e-mobility applications) (Jones, Acuña and Rodríguez, 2021b) (see figure IV.4).

Figure IV.4

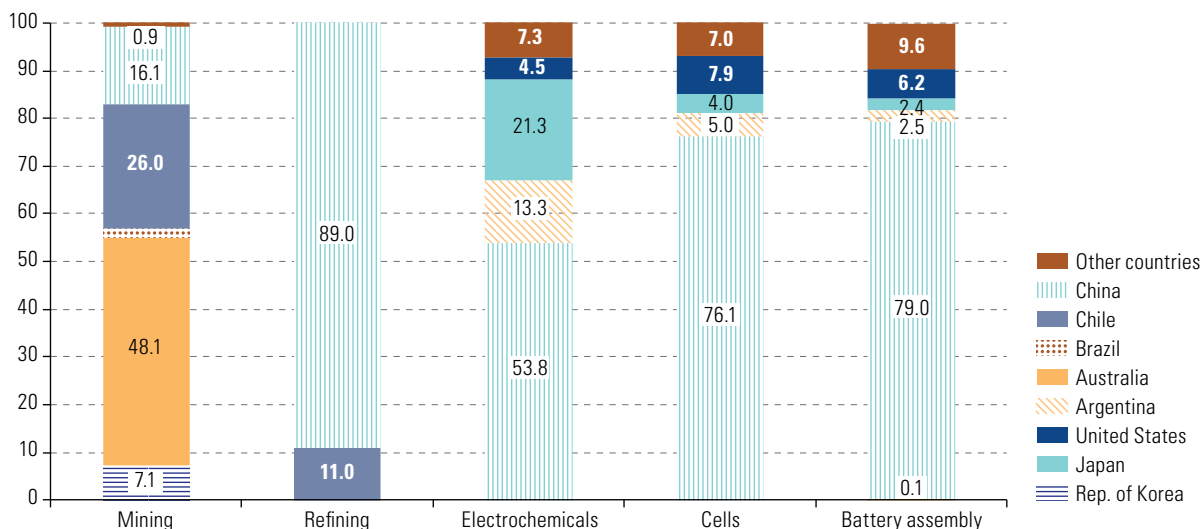
Estimated and projected end uses for lithium in the world, 2006–2030
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United States Geological Survey (USGS), *Mineral Commodity Summaries*, 2007–2022 [online] <https://www.usgs.gov/centers/national-minerals-information-center/mineral-commodity-summaries> and B. Jones, F. Acuña and V. Rodríguez, "Cambios en la demanda de minerales: análisis de los mercados del cobre y el litio, y sus implicaciones para los países de la región andina", *Project Documents* (LC/TS.2021/89), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2021.

Adding value to the lithium industry can be a mobilizing objective of industrial policy. Mineral extraction accounts for most of the activity in the region, which is losing share as it moves up the value chain, while the share of Asian countries is growing (see figure IV.5).

Figure IV.5
Participation of countries in the lithium-ion battery value chain, 2020
(Percentages of production for each link)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United States Geological Survey (USGS), *Mineral Commodity Summaries*, 2020 [online] <https://www.usgs.gov/centers/national-minerals-information-center/mineral-commodity-summaries>, D. Stringer and L. Millan, "These mining superpowers supply the world's lithium. Now they want to make batteries, too", Bloomberg, 3 January 2019 [online] <https://www.bnnbloomberg.ca/these-mining-superpowers-supply-the-world-s-lithium-now-they-want-to-make-batteries-too-1.1268021>, Federal Consortium for Advanced Batteries (FCAB), *National Blueprint for Lithium Batteries 2021–2030*, 2021, R. Poveda Bonilla, "Políticas públicas para la innovación y la agregación de valor del litio en Chile", *Project Documents* (LC/TS.2020/84), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2021, B. Jones, F. Acuña and V. Rodríguez, "Cadena de valor del litio: análisis de la cadena global de valor de las baterías de iones de litio para vehículos eléctricos", *Project Documents* (LC/TS.2021/86), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2021 and G. Bhutada, "Mapped: EV battery manufacturing capacity, by region", Visual Capitalist, 28 February 2022 [online] <https://www.visualcapitalist.com/mapped-ev-battery-manufacturing-capacity-by-region/>.

The three countries of the lithium triangle have policies to develop a lithium industry to add value to this raw material. These policies vary depending on the stakeholders and on established regulatory frameworks and instruments. These efforts can foster a new kind of industrial policy for the development of productive and technological capabilities (see table IV.2).

Table IV.2
Regulatory frameworks for lithium exploitation and capacity-building instruments and mechanisms to add value to this resource in lithium triangle countries

Legal framework/Countries	Argentina	Chile	Plurinational State of Bolivia
Lithium-specific or general mining regulations	General (with specific legislation at the provincial level)	Specific	Specific
Centralized or federal government	Federal	Centralized	Centralized
Resource exploitation conditions	Concession to private companies Jujuy province: shareholding in provincial state-owned company	Agreement between the Production Development Corporation (CORFO) and private companies Authorized options that are not in force: state exploitation; special operating contract for lithium	Public-private partnership (with foreign companies)
Regulatory scope	Restricted to the exploitation of the resource	Focus on resource exploitation with a preferential price quota for lithium industrialization projects	Exploitation and industrialization in downstream production chain activities

Legal framework/Countries	Argentina	Chile	Plurinational State of Bolivia
Production strategy: upstream production chains	Concession to private companies	Agreements with private companies Tendering process for the installation of private companies	Joint venture between the association of Yacimientos de Litio Bolivianos (YLB) with private (foreign) companies YLB pilot plants
Production strategy: upstream production chain activities	Joint venture with (foreign) private company Joint venture (YPF Tecnología (Y-TEC))		
Research and development strategy	Decentralized system with little coordination: - R&D activities of the National Science and Technology System - Creation of a tripartite research centre (National Council of Scientific and Technical Research (CONICET), National University of Jujuy: Centre for Research and Development in Advanced Materials and Energy Storage of Jujuy (CIDMEJu)) - National Council of Scientific and Technical Research (CONICET). Lithium defined as a strategic issue: resource development and project financing	University system Tendering process for the creation of R&D centres financed by lithium producers: Institute of Clean Technologies; Technological Centre for the Circular Economy; Centre for the Development of e-mobility	YLB research centres Support for training and research at national universities

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of M. León, C. Muñoz and J. Sánchez (eds.), “La gobernanza del litio y el cobre en los países andinos”, *Project Documents* (LC/TS.2020/124), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2020.

Options exist in the region to promote innovation, technological development and value addition in the lithium-ion battery value chain, both upstream and downstream. For example, developing more efficient technologies for lithium extraction from salt flats, improving water management and water use; increasing the production of battery-grade lithium carbonate from brine given its comparative advantage over rock extraction and advancing direct extraction technologies without increasing environmental footprints. Other options include advancing in the production of active materials (precursors), cathodes, cells and batteries to develop e-mobility in the region.

Electric public transportation policies, discussed in the following section, can help build the supply and demand of electric vehicles and be combined with other medium-term national initiatives. These can include the development of smaller-scale niches, for example using materials and compounds available in the region to produce chemicals such as lithium iron phosphate for batteries used in stationary storage technologies for housing, industry, public services and other applications. This could encourage the development of a critical mass of providers and users and the identification of economies of scale that would make the construction of a regional gigafactory viable in the medium and long term. This initiative generates certain problems that must be addressed in a coordinated manner to advance agreements for regional integration, such as possible partnerships with automotive companies, particularly those that produce in the region and have made progress in developing electric vehicle production (Ford, Renault, Toyota and Volkswagen, for example) (Jones, Acuña and Rodríguez, 2021a).

The circular economy can also be developed around lithium by mobilizing the raw materials and manufacturing involved in making lithium-ion batteries, for example. The operational lifespan of the components used in renewable energy and e-mobility technologies, such as lithium-ion batteries, could be extended, and their components recycled and reused.

Adding value to lithium presents numerous problems, however. Differences in the chemical composition of each salt flat means that extracting and processing lithium requires scientific and technical skills and knowledge not always available and that need to be developed or transferred via foreign investment. The same applies to the capabilities and expertise needed in the chemical industry, for the production of the specialized and complex components high on the lithium-ion battery value chain, due to the exacting specifications involved in the materials and compounds of this technology. In addition, different battery chemistries require raw materials that are not produced in the region, such as battery-grade nickel and cobalt, given the chemical differences in the various types of lithium battery. Infrastructure for the roll-out of these technologies is in its earliest stages or shows modest signs of development.

Public policymakers must adopt a strategic outlook and a sense of urgency: the region's window of opportunity for lithium exploitation driven by the lithium-ion battery industry is expected to last only a few years (Obaya and Céspedes, 2021; Jiménez and Sáez, 2022). Several factors are closing this window: (i) the development of new battery technologies that replace lithium-ion batteries or enable their reuse and recycling, (ii) the time needed to develop new extraction projects, (iii) the global abundance of lithium, which will lead several countries, for economic or geopolitical reasons, to begin extraction or seek alternatives, such as the recycling of lithium-ion batteries and (iv) the significant environmental impact on salt flats as well as social conflict.

The feasibility of adding value, developing technologies and innovating in the various stages of battery and electric vehicle value chains in the region will depend largely on capacity-building. The countries of the region have the opportunity to build national public policies and institutional arrangements at the regional level, based on the lithium industry and other key minerals, to kickstart development of the capabilities needed to produce technologies in niche markets in the battery industry and linkages in a regional e-mobility market.

B. Opportunities in the growing e-mobility market

Urban mobility presents significant opportunities in the fight against climate change and wide-ranging economic and social potential. Profound transformation is under way in this area. The established trend of urbanization, favoured by combustion-powered transportation, has increased concern about gridlock, air quality, greenhouse gas emissions and climate change, leading to changes in consumer preferences. In this context, the automotive sector can play a key role in generating new solutions for sustainable and effective mobility. This industry can contribute to GDP and competitiveness in countries where production is located, in addition to generating direct and indirect employment.¹³

In recent years, advances in engine and battery technology have given rise to new products and production processes. Combined with increasingly stringent environmental regulations and strategic action by governments, this innovation is driving major change in global vehicle production and consumption. At varying speeds, established companies have begun transitioning to e-mobility, adapting their products to new technology standards. Other players have burst onto the scene with no previous experience in electric vehicle production.

The move towards sustainable mobility in Latin America and the Caribbean is slow, despite a consensus on the urgency and importance of the process and the significant opportunities it presents. To change this dynamic—in urban public transportation, in particular—¹⁴ there is a need both to properly understand industry and city conditions in order to finance this transition, and for dialogue to facilitate coordination and generate the economies of scale required to make this change viable by scaling up manufacturing.

In today's international environment, defined by the rapid consolidation of new market dynamics, business models, leading companies and technological possibilities, several countries are competing to build new high-value industrial clusters for mobility. The region's automotive sector has yet to show clear signs it will take advantage of the opportunities arising in a deeply changing industry, as evidenced in two cases, examined below: the production of light electric cars in Mexico and electric buses in Brazil.

¹³ UNEP (2020, page 46, figure 29) estimates that the process of electrifying nearly four million heavy vehicles and over one million light vehicles in the region would create more than five million additional jobs.

¹⁴ The financial woes of public transportation systems have been accentuated by the coronavirus disease (COVID-19) pandemic, complicating the transition to sustainable mobility. In many cities in the region, the operating costs of official public transportation systems far exceed fare revenues. This results in deficits and high levels of public subsidy but does not improve services.

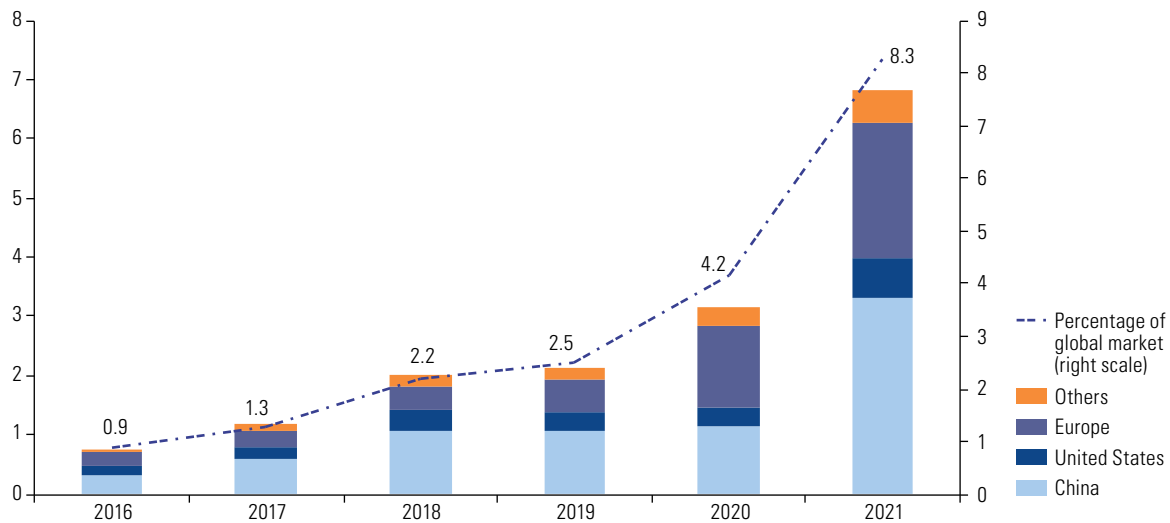
1. Mexico in the North American light electric vehicle production chain

Between 2017 and 2021, global sales of electric passenger cars, vans, sport utility vehicles (SUVs) and pickup trucks rose from 1.18 million to 6.83 million units, increasing the share of electric vehicles in total light vehicle sales from 1.3% to 8.3% (see figure IV.6).¹⁵ The number of light electric vehicles on the world's roads in this period of rapid growth already exceeds 16.5 million units (IEA, 2022). Sales of these vehicles could reach 20.6 million by 2025 and account for some 23% of total global automobile sales (McKerracher and others, 2022). However, despite recent progress, the adoption of electric vehicles remains largely concentrated in China, Europe and the United States. Overall, strong growth has been driven by strict CO₂ emission standards and consumer and other tax incentives offered in major markets.

Figure IV.6

Global sales and market share of light electric vehicles, 2016–2021

(Millions of units and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Energy Agency (IEA) and EV-volumes.com [online] <https://www.ev-volumes.com/>.

China is the world's largest market for light electric vehicles. Government efforts to accelerate decarbonization and support the manufacturing and purchase of electric vehicles through subsidies, tax exemptions and financial incentives have been crucial to the growth of this market. One goal of the country's 2021–2025 five-year plan is to increase the share of electric vehicles in total vehicle sales to 20% by the end of the period.

Given the steady expansion of the electric vehicle market, in many advanced economies the dynamic effect of public policies is losing strength, while consumer demand is an increasingly influential factor. Supply in the electric vehicle market is becoming an important constraint on broader consumer adoption (McKerracher and others, 2022).

In this context, automakers have implemented strategies that include e-mobility not only to comply with regulations or take advantage of government incentives, but also to benefit from changing consumer trends, increase market share and maintain a competitive advantage. Major global manufacturers have announced plans to accelerate the transition to an all-electric future by developing new product lines and converting existing manufacturing capacity (see table IV.3).

¹⁵ In 2021, battery electric vehicles (BEVs) accounted for 71% of total electric car sales and plug-in hybrid electric vehicles (PHEVs) 29%.

Table IV.3

Share of electric vehicles in total sales of original equipment manufacturers, 2025–2040

(Percentages)

	2025	2030	2035	2040
Toyota			100	
Volkswagen		Europe (70) China and the United States (50)		100
BMW		50		
Mercedes-Benz	50		100	
Volvo		100		
Stellantis ^a		Europe (100) United States (50)		
Ford		World (50) Europe (100)		
General Motors			100	
Hyundai			Europe (100)	

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information provided by the companies.

^a The Stellantis Group, headquartered in the Netherlands, is the result of the merger between the Italian-American manufacturer Fiat Chrysler Automobiles (FCA) and the French PSA Group in January 2021. Stellantis manufactures and markets the Fiat, Alfa Romeo, Lancia, Maserati, Abarth, Jeep, Chrysler, Dodge and RAM brands of FCA, and the Peugeot, Citroën, DS, Opel and Vauxhall brands of PSA group.

Similar to sales, new investments in light electric vehicle production have been concentrated in China, the European Union and the United States. However, this dynamic is set to change in the coming years in line with ambitious announcements by major manufacturers. The automotive industry is moving into this industrial transition in Latin America, albeit slowly. Currently, major global manufacturers supply the region's local markets with imports. However, shortcomings in charging infrastructure and low consumer awareness and confidence continue to keep the share of electric vehicles in total car sales low, despite its rapid growth.

The first production-related signs have been seen in Mexico, following measures by major automakers to strengthen their e-mobility production capacity in the United States given that Mexico—a member of the United States-Mexico-Canada Agreement (USMCA)—is a key location of production chains for the North American automotive industry (ECLAC, 2017). In 2021, United States-based Ford began producing an electric Mustang Mach-E model for the global market at its facilities in Cuautitlán, State of Mexico. The production facility was transformed to incorporate new technology, equipment and training for employees. In addition to this first electric vehicle model, the company has announced it will produce two new models in Mexico—one for Ford and one for Lincoln—that will come onto the market in 2023.

In 2021, General Motors announced a US\$ 1 billion investment in the expansion and adaptation of its assembly lines at the Ramos Arizpe, Coahuila plant for the production of batteries and electric cars (Rodríguez, 2021). After a first stage of assembling batteries and electric engines, manufacturing of electric vehicles is set to begin from 2023.

Other manufacturers, such as Nissan in Japan and BMW and Volkswagen in Germany, have also announced plans to bolster their electric vehicle production capacities in the country in the medium term. Starting in 2027, BMW will make its iX3 electric SUV and an electric battery version of the 3 Series model at its plant in San Luis Potosí. Nissan announced it would invest US\$ 700 million to prepare the Aguascalientes plant for the production of electric vehicles. Although Volkswagen focuses its efforts in this sector in the United States, the company may begin to adapt its plants in Puebla and Silao (Guanajuato), for the assembly of electric vehicles and components by the middle of this decade.

In summary, despite a clearly defined strategy on the part of major global manufacturers to move towards electrification, the response in Latin America remains modest. Progress in transforming an automotive industry in a region dominated by transnational companies will come when the latter perceive a more favourable environment for e-mobility. Currently, major investments in the new light electric vehicle cluster in the Americas are concentrated in the United States, reflecting strong public policies in support of the industry, the adoption

of environmentally friendly vehicles and the strengthening of the required enabling infrastructure. Among Latin American countries, Mexico has stood out in the reconfiguration of value chains in North America, with announcements of new investments to adapt certain some existing plants.

2. Brazil: a window of opportunity for manufacturing electric buses

After light vehicles, the trend towards electrification now includes heavy vehicles and predominantly buses. Currently, about 670,000 electric buses and some 66,000 electric trucks are in circulation worldwide, accounting for 4% and 0.1% of the global bus and truck fleet, respectively (IEA, 2022).

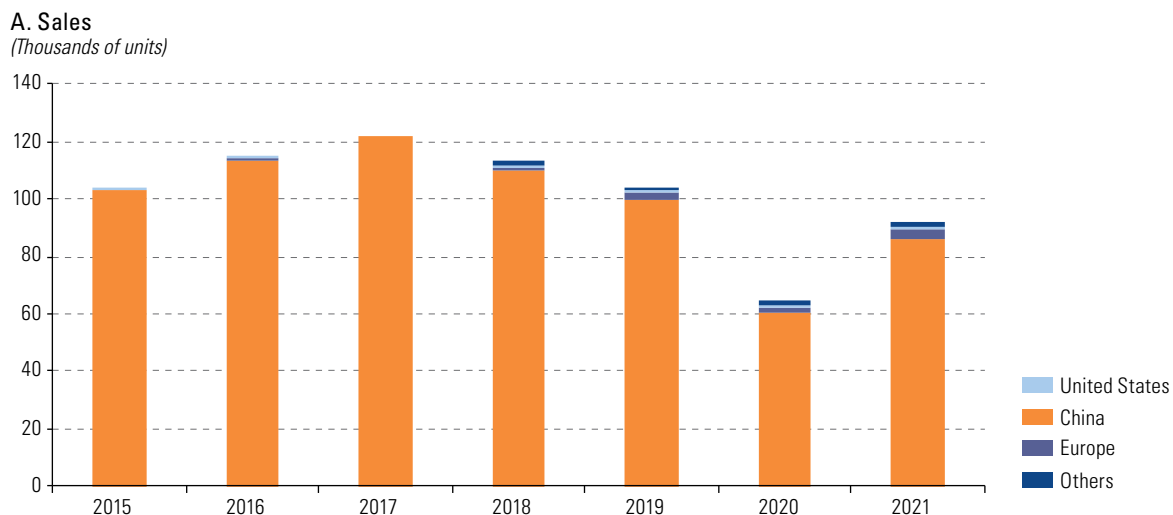
The rapid development of new drivetrain technologies has made e-mobility a realistic option, making it a sustainable mode of public transportation with greater potential for adoption in urban centres. Electric buses are advancing rapidly towards technological maturity, mainly in the area of batteries, resulting in increased autonomy and lower manufacturing costs. This progress is accompanied by multiple commitments from national and subnational governments aimed at establishing specific goals and deadlines to quicken the transition to e-mobility in public transportation.

The electric bus market has been strongly concentrated in China, due to an ambitious, multi-objective strategy to reduce pollution in large cities, develop a renewed public transport system and enhance local technological and production capacities. Currently, some 90% of the world's active electric bus fleet is driven in Chinese cities (see figure IV.7). In fact, most of the country's cities are expected to complete electrification of their public transport fleets in the near future. In this context, electric bus manufacturers in China have become world leaders in this emerging industry. Specifically, China created a collaborative environment between government bodies, fleet operators, bus manufacturers, financial institutions and freight companies, significantly reducing the technological uncertainty and operating costs of public transportation systems.

The electric bus market will grow significantly in the near future. From 112,041 in 2022, worldwide annual sales of electric buses are expected to reach 671,285 units by 2027 (Sustainable Bus, 2022). Although China will maintain its first-place position, significant growth is expected in Europe and in the United States in particular. A number of developing countries, including India and certain Latin American economies, will likewise become active in this market with time.

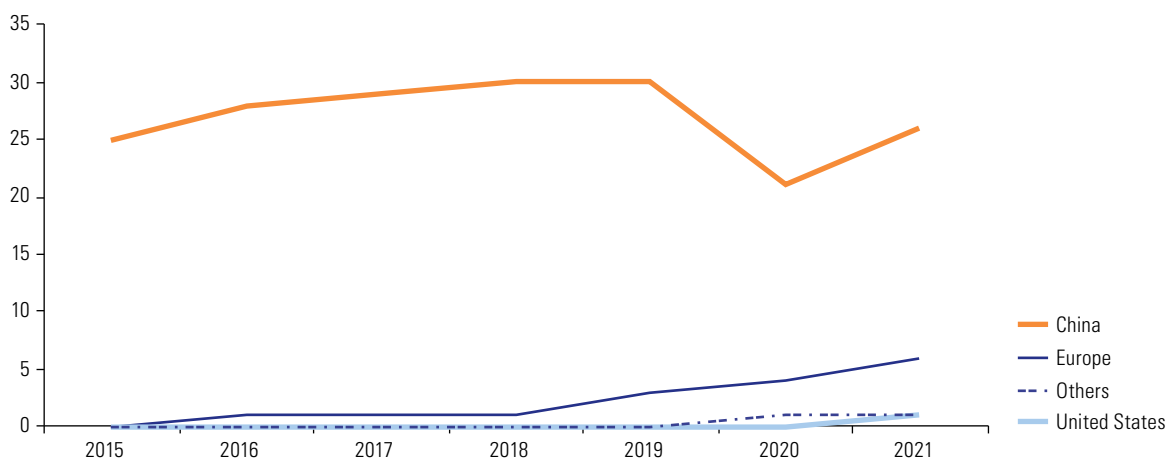
Figure IV.7

Electric bus sales and share of total fleet, by selected countries and regions, 2015–2021
(Thousands of units and percentages)



B. Share of electric buses in the total fleet

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Energy Agency (IEA), “Electric bus registrations and sales shares by region, 2015-2021”, 2022 [online] <https://www.iea.org/data-and-statistics/charts/electric-bus-registrations-and-sales-shares-by-region-2015-2021>.

In Europe, a combination of stricter environmental regulations and the proliferation of measures to support and promote the electrification of public transport are rapidly changing the landscape. Various measures, including European Union directives for member States, national policies and municipal action, have mobilized market players to test and develop advanced vehicles, which has accelerated the adoption of electric buses. The trend towards the electrification of public transport bus fleets is currently being confirmed in most European countries. By the middle of this decade, it is estimated that over 10,000 units will be added to fleets each year, equivalent to 60% of total bus sales. By 2030, two thirds of all new buses are expected to be zero-emission, most of them electric (Luman, 2021).

Europe has responded by stepping up and diversifying production rapidly, eroding the position of Chinese manufacturers, mainly BYD and Yutong, which have supplied the European market through their own plants, strategic partnerships and imports.

In the United States, electrification of mass transport got off to a slow start due to a lack of charging infrastructure, the low ranges of initial models, which made them unsuitable for cold climates (where interior heating quickly drained the battery) and limited local capacity to meet demand. China-based manufacturer BYD dominated early electric bus production in the United States, but technological progress enabling improved range, efficiency and availability encouraged other manufacturers to roll out new production capacity. Thus, well established manufacturers on the traditional bus market, such as Daimler, Volvo and New Flyer, along with newcomers such as Proterra and Greenpower, began to commercialize new and improved electric vehicles.

Recently, this transition has been strongly promoted by the United States federal government. The administration of President Joe Biden has rolled out an ambitious programme to address climate change, notably via the Build Back Better Act, which allocates US\$ 7.5 billion for the purchase of electric buses (Bellon, 2021). In 2022, the federal government will award nearly US\$ 1.5 billion in grants to modernize bus fleets as well as enabling infrastructure. Of these resources, US\$ 1.1 billion will go to the Low or No Emission Vehicle Program to help transit agencies purchase or lease low- or no-emission vehicles manufactured in the United States (FTA, 2022). Some US\$ 5.5 billion will be allocated over five years — 10 times more than the previous period, making it the largest investment ever made in this area in the country (Randall, 2022a). Similarly, US\$ 2.91 billion has been earmarked for the development of a national battery supply chain (Randall, 2022b). Given the shift of a growing number of cities to e-mobility and the introduction of powerful stimulus programmes, a strong push is expected in the electric bus manufacturing industry in the United States.

As mentioned, global electric bus manufacturing capacity is concentrated in a handful of large Chinese companies, Yutong, BYD, CRRC, Zhongtong, Higer, Ankai and King Long. Together, they account for over 60% of global production (ECLAC, 2022b). However, European and United States companies have adopted ambitious strategies to establish themselves on the attractive emerging electric bus market. In this process of industrial reorganization, heavy-vehicle original equipment manufacturers (OEMs) well established on the traditional bus market have accelerated the transition to e-mobility (see table IV.4). Similarly, smaller manufacturers on the urban bus market, including a few specialized in electric vehicles, are also accelerating efforts to strengthen and expand their production and technological capabilities to establish themselves on the e-mobility market (see figure IV.8).

Table IV.4

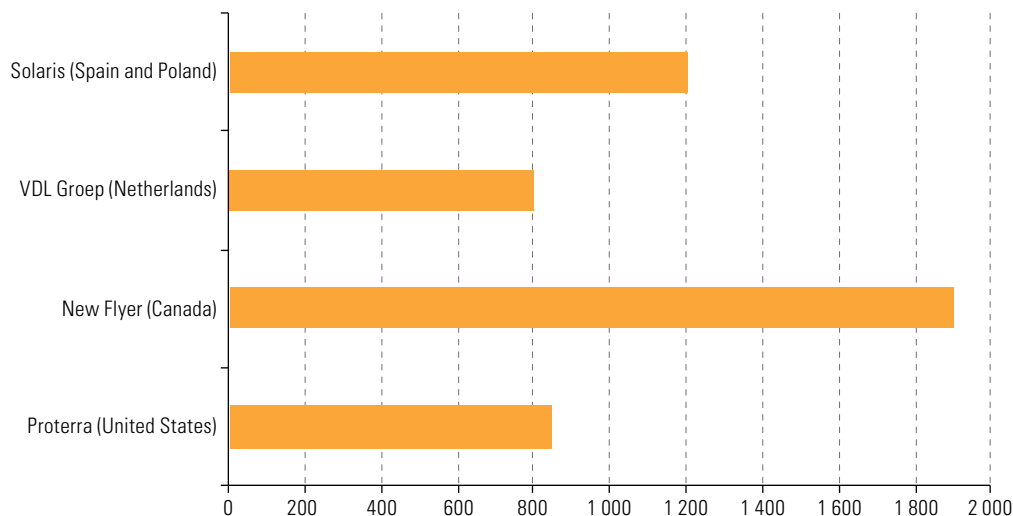
Share of electric vehicles in total sales of original equipment manufacturers, 2025–2030
(Percentages)

	2015	2025	2030
Volvo	Europe (100)		
Daimler			Europe (100)
Volkswagen (MAN)		50	90
IVECO Heuliez			100

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information provided by the companies.

Figure IV.8

Electric buses in circulation, by manufacturer, July 2022
(Units)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information provided by the companies.

In Latin America, the adoption of stricter environmental standards and regulations to reduce emissions has led to some progress in e-mobility. Certain countries, such as Chile, Colombia and Costa Rica, have set targets for the electrification of public transport vehicles. Efforts to establish a shared vision among stakeholders on the future of urban mobility are also under way—with varying degrees of success—as countries begin to develop national e-mobility plans.

While instruments promoting the acquisition, use and circulation of electric buses have predominated in countries of the region, most initiatives do not prioritize the procurement of locally manufactured buses. Moreover, in some cases, tax exemptions and tariff reductions are granted for the purchase and importation of electric buses, for example, in Chile, Colombia and Mexico. This situation, coupled with a lack of policies and incentives to support the manufacturing or assembly of electric buses, has discouraged local production.

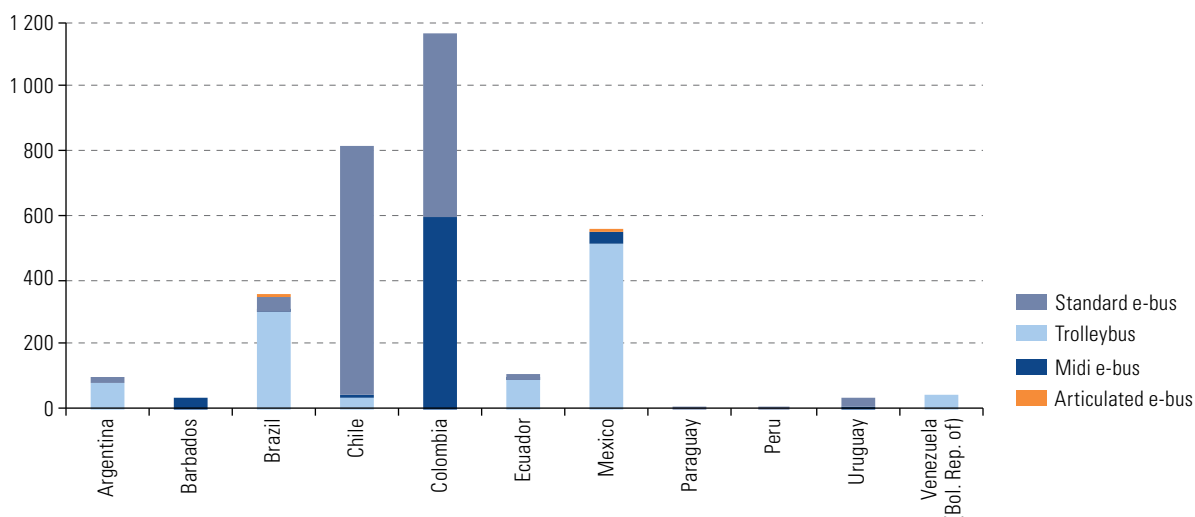
In addition, e-mobility incentives can be difficult to coordinate, making it hard to forecast future demand—a prerequisite for companies to plan their investments (ECLAC, 2022b).

In April 2022, 3,209 electric public transport vehicles were in operation in major Latin American cities—less than 4% of all bus fleets. Colombia is leading efforts to incorporate electric buses, in Bogotá in particular, with 1,165 units, followed by Chile (819), Mexico (556) and Brazil (351) (see figure IV.9).

Figure IV.9

Latin America: electric buses in circulation, by model and country, April 2022

(Units)



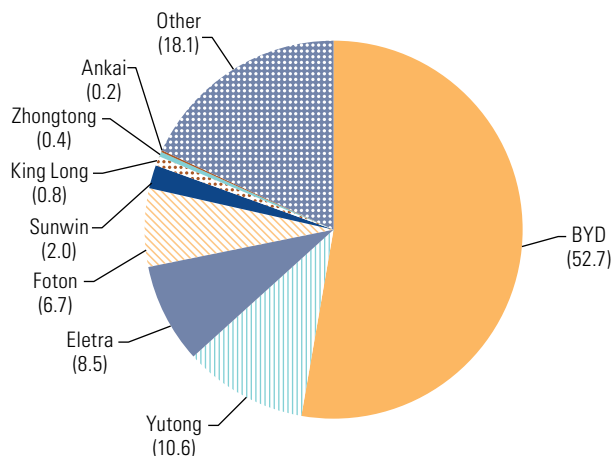
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of E-Bus Radar, Latin America, 2022 [online] <https://www.ebusradar.org/en/> [accessed on 23 June 2022].

Often, electrification starts with the importation of vehicles and most of the key components of the supporting infrastructure. Chinese manufacturers are the largest suppliers of electric buses in Latin America, accounting for more than 70% of purchases (see figure IV.10). More than half of all electric buses are manufactured by the Chinese company BYD. In some cases, such as Colombia, BYD accounts for more than 90% of the country's new acquisitions. Brazil is an unusual case in that it purchases more than 75% of its buses from Eletra, a national company. However, if only battery-run buses are considered, BYD is the main supplier, as is the case in other Latin American countries.

Figure IV.10

Latin America: electric buses in circulation, by manufacturer, April 2022

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of E-Bus Radar, Latin America, 2022 [online] <https://www.ebusradar.org/en/> [accessed on 23 June 2022].

Despite the increase in electric bus demand in the region and a favourable outlook for the near future, regional supply continues to lag. Innovative business models¹⁶ that include subsidies, financing and mechanisms that separate vehicle operation from ownership have been adopted to nudge in the right direction those involved in expanding electric bus fleets. This has enabled the entry of new players to the automotive sector, such as energy companies, which are essential for the roll-out of charging infrastructure.

The best coordinated and internationally positioned production hub is located in Brazil. Some world leaders in the manufacturing of chassis and end products operate there, along with highly competitive local companies, especially in the bodywork segment, in which Marcopolo stands out. However, the conventional industry is insufficiently robust to respond adequately to change on a global scale. In fact, in the face of possible future disruptions, effective coordination of the change process will be needed to make demand predictable and the required investments feasible. Given existing international commitments and national policies aimed at mitigating climate change, there is a need to begin developing new products, use environmentally-friendly technologies and pave the way for investment, building on existing capacities and assets.

In Brazil, despite the absence of clear public policy to support the electrification of production, major OEMs —mainly chassis manufacturers— and some local companies are making their way into the electric bus market or have announced plans to electrify their products (see box IV.1).

Box IV.1

Investments in electric buses in Brazil

- Since 2014, Chinese manufacturer BYD has invested over US\$ 150 million in the production of electric buses in Brazil. Most of this investment was earmarked for the construction of a plant in Campinas in the State of São Paulo for the assembly of electric bus chassis. Currently, the plant can produce 2,000 chassis per year or 1,000 in the case of articulated models (Verotti, 2021). In 2020, the company opened a battery factory at the Manaus Industrial Pole, in the State of Amazonas. BYD currently markets six models of battery-electric chassis for buses.
- As part of its global strategy, the German company Daimler has concentrated its electric bus production for the Latin American market in Brazil. In 2021, Daimler announced the launch of the first fully developed electric bus chassis in the country, with a range of 250 km, for which nearly US\$ 20 million was invested (Fan Bus, 2021). Daimler's new chassis will launch in the second half of 2022 and be sold on markets in Latin America, Europe and Oceania.
- In late 2020, Volkswagen Truck & Bus, part of the Volkswagen Group, announced an investment of approximately US\$ 390 million from 2021–2025. The largest-ever investment by Volkswagen Truck & Bus in its 40-year history will focus on the development of electric and hybrid models in Brazil. This allowed the company to begin manufacturing e-delivery trucks (Kutney, 2020).
- AB Volvo announced it would invest some US\$ 280 million in the production of buses and trucks in Brazil at its Curitiba plant between 2022 and 2025. It is estimated that the final stage of the investment cycle will focus on the development of electric vehicles (Olmos, 2022).
- The bodywork specialist Marcopolo has partnered with local electric chassis manufacturers such as BYD to develop its own electric bus, called Marcopolo Attivi. The company wants to further expand its expertise and weight in this segment and has announced the development of its own electric chassis. Production of the Marcopolo Attivi is set to start in the second half of 2022 (Estradão, 2022).
- In 2013, the Brazilian company Eletra launched the first electric bus manufactured in Brazil, an 18-metre articulated bus. Eletra also works in partnership with other chassis and body manufacturers, such as Mercedes-Benz, CAIO, Marcopolo, and engine and battery suppliers such as WEG and Grupo Moura, and is responsible for the integration of

¹⁶ Unlike conventional business models, new ones separate ownership and operation, allowing risk to be spread among a wide range of stakeholders. In Chile and Colombia, innovative business models promote the electrification of public transportation.

different systems and components, with a nationalization rate of 82%, excluding batteries (Barassa and others, 2022). In early 2022, Eletra announced the transfer of its industrial operations to a new plant located in São Bernardo do Campo, in the State of São Paulo, where it will produce up to 1,800 electric and hybrid buses annually for the Brazilian market as well as other Latin American countries such as Argentina, Ecuador and Mexico.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of A. Verotti, “BYD mostra toda a energia”, *Istoé Dinheiro*, 5 November 2021 [online] <https://www.istoedinheiro.com.br/byd-mostra-toda-a-energia/>, Fan Bus, “Mercedes Benz do Brasil apresenta el chasis e500U totalmente eléctrico”, 1 September 2021 [online] <https://www.fanbus.cl/2021/09/mercedes-benz-do-brasil-presenta-el.html>, P. Kutney, “VWCO investirá R\$ 2 bilhões até 2025 e contrata 550 em Resende”, *Automotive Business*, 10 December 2020 [online] <https://www.automotivebusiness.com.br/pt/posts/noticias/vwco-investira-r-2-bilhoes-ate-2025-e-contrata-550-em-resende/>, M. Olmos, “Volvo anuncia investimento de R\$ 1,5 bilhão para produção de ônibus e caminhões no Brasil”, *Valor Investe*, 2 February 2022 [online] <https://valorinveste.globo.com/mercados/renda-variavel/empresas/noticia/2022/02/02/volvo-anuncia-investimento-de-r-15-bilhao-para-producao-de-onibus-e-caminhoes-no-brasil.ghtml>, Estradão, “Ônibus elétrico Marcopolo Attivi começa a ser feito no 2º semestre de 2022”, 21 June 2022 [online] <https://estradao.estadao.com.br/onibus/onibus-eletrico-marcopolo-attivi-comeca-a-ser-feito-no-2o-semestre-de-2022/>, and E. Barassa and others, “Oferta de ônibus elétrico no Brasil em um cenário de recuperação econômica de baixo carbono”, *Project Documents* (LC/TS.2022/9), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022.

In summary, there are several positive sides to emerging capacity-building for electric bus manufacturing in Brazil. First, the presence of both OEMs and local firms, such as BYD and Eletra, specialized in the production of electric buses. Second, subsidiaries of some major OEMs—leaders in the global market for conventional buses—are gradually moving towards the production of electric units in their Brazilian plants; examples include Daimler and the projects announced by Volkswagen and Volvo. Lastly, some suppliers, such as Marcopolo and WEG, are strengthening their production capacities and technologies to adapt to a scenario where e-mobility will increasingly gain ground.

3. Policy recommendations

In a context marked by the need to address the risks of climate change and by the rapid transformation of the automotive sector, a window of opportunity exists in which to develop new productive capacities in the region.

As in advanced countries, in the electric car segment more ambitious and permanent policies are needed over time to stimulate demand. One solution is to combine stricter standards in terms of vehicle energy efficiency and reduction of CO₂ emissions with incentives and subsidies for the purchase of electric vehicles. In parallel, coordinated public-private initiatives need to support the roll-out of charging infrastructure. Government action in the form of regulation and incentives should ensure and expand access to charging infrastructure for both collective and individual transport. Vehicle manufacturers and energy companies can implement more proactive business models and become key agents for the roll-out, development and expansion of these technologies.

Support for demand should be accompanied by action to help accelerate the transformation of existing local capacities, as well as create new businesses geared towards the development of the e-mobility production chain. As seen in earlier stages in the development of the Latin American automotive industry, public policies should play a key role in the new phase that is (slowly) unfolding. Given that most of the region’s productive capacity was created by transnational companies, which have already shown a willingness to move towards a new low-emission business model, public policies should align with and strengthen these global guidelines. It is very likely that the same patterns in conventional automobile specialization will be seen for electric vehicles, with Mexico in the North American value chain, and Argentina and Brazil supplying the subregional market. In this scenario, public policies initially should generate incentives to accelerate the adaptation of production lines and send signals regarding the development of a stable and growing local market for electric vehicles.

One segment that is particularly attractive is electric bus manufacturing, which requires a market of ensured predictable demand and adequate scale for production in order to take off in the region. To achieve this, progress in planning a gradual, step-by-step and scheduled transition to e-mobility is crucial. Accelerating the transition to electric bus production implies overcoming the lack of direct support for the industry through

mutually reinforcing public policies and programmes of subsidies and incentives. Long-term public financing that allows the sharing of related risks and capital costs with companies plays a catalytic role in this type of productive investment.

Promoting and strengthening national systems to retrofit conventional vehicles with electric drivetrains could support learning and the adaptation of local production to the new technological model. Retrofitting schemes would boost economic activity and employment in plants, as well as training and development processes for components and parts. It would also significantly lower the price tag of electric vehicles since, according to the Latin American Retrofit Association, a traditional car could be retrofitted for a third of the cost of a new electric car. Moreover, electrical conversion strengthens circular economy dynamics (see the following section). Given that a lack of regulation strongly impedes investment in conversion, ECLAC (2021g) proposes a regulatory framework to support these investments.

The transition to electric vehicle production is a technological, economic, environmental and social challenge that must be accompanied by a comprehensive set of complementary measures. It requires support in the development of renewable energies and sustainable production processes, including the creation of solutions for the disposal of batteries at the end of their useful life that are compatible with a circular economy approach. Continuous training of qualified labour is also needed to enable the operation and maintenance of the different kinds of electric vehicles on the market.

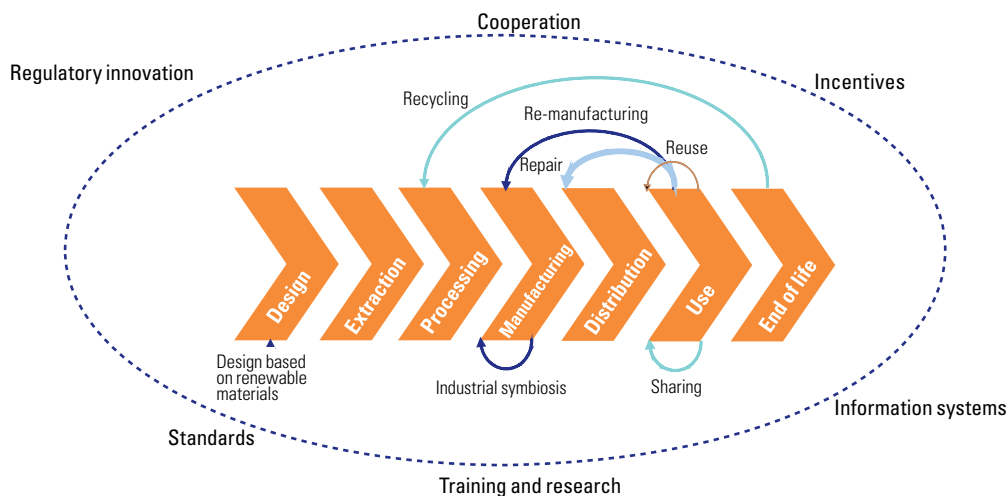
C. The circular economy: a cross-sector strategy

1. The circular economy as a tool for sustainability

The circular economy is a transformational model of production and consumption which involves the optimization of resources, technological innovation and the development of new business models (ECLAC, 2020a). This model, which promotes local chains and, to some extent, reduces dependence on global chains, is based on more careful use of the physical resources extracted across the value chain and the harmonization of quality standards for recovered and extracted materials for systematic scale-up. Circular business models can therefore reduce resource extraction and dependence on imported inputs in global chains (see diagram IV.2).

Diagram IV.2

Analysis framework for the circular economy in production chains



Source: B. Van Hoof, G. Núñez and C. de Miguel, "Metodología para la evaluación de avances en la economía circular en los sectores productivos de América Latina y el Caribe", *Production Development series*, No. 229 (LC/TS.2022/83), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022.

Various initiatives around the world are leading the way in the circular economy. The European Union is considered the most advanced in terms of planning, measures and regulatory frameworks for innovation in the transition to circular value chains, from raw material extraction to end of life and disposal, as well as for higher quality standards in terms of safety, risks and regulations. Objectives pursued include maintaining the value of products, materials and resources by re-using them at the end of a product's life cycle to minimize waste, resource extraction and negative effects on the environment. A circular economy can be encouraged by measures like financial, regulatory and information-related market incentives as well as innovation models, including the smart use of products and manufacturing based on rethinking, rejecting and reducing the use of resources (Van Hoof, Núñez and De Miguel, 2022).¹⁷

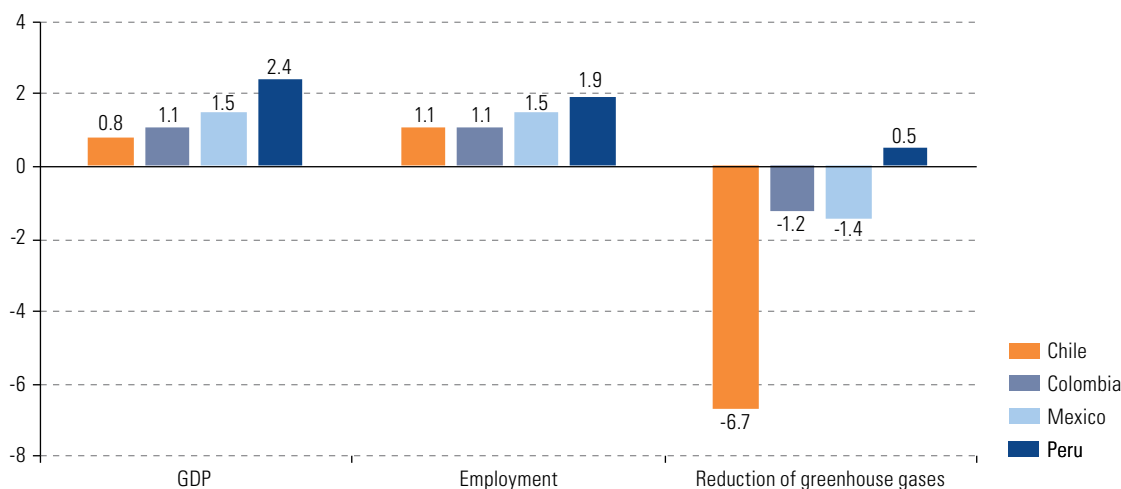
Concept definitions are the starting point towards the implementation of a circular economy model. A sustainability taxonomy—or organizational structure for information— facilitates measurement and makes it possible to order and classify elements that contribute to circularity in addition to providing certainty to economic actors, confidence and security to investors, and better monitoring of sustainable financial flows (OECD, 2021). These definitions must be flexible and reflect ongoing change in ecosystems, technological innovation, production organization models and changing trends in demand.

Latin America and the Caribbean are moving forward in the transition to a circular economy with the help of various legal frameworks, policies and sectoral systems that facilitate its implementation and promote sustainability. One step forward has been the Latin America and the Caribbean Circular Economy Coalition (CEC), an initiative launched in 2020 consisting of a platform for the exchange of experiences, practices and progress in strategy in countries of the region (CEC, 2022).

Estimates have been made on the effects of achieving certain targets relating to the circular economy—reducing the use of plastics by 8%, of metals by 5% and of construction materials and fossil fuels, linked directly to policies on the circular economy, energy efficiency and low-carbon development policies— on GDP, employment, greenhouse gas emissions and imports in four countries in the region: Chile, Colombia, Mexico and Peru. The results are presented in figure IV.11, which compares a scenario in which national circular economy targets are progressively met by 2030 to the baseline scenario.

Figure IV.11

Latin America (4 countries): effects of achieving circular economy targets, 2030
(Percentage variation compared to the baseline scenario)



Source: O. Rodríguez and others, “Modelamiento de los efectos macroeconómicos de la transición a la economía circular para América Latina: casos de Chile, Colombia, México y el Perú”, *Project Documents*, Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022, forthcoming.

¹⁷ For a taxonomy of the circular economy, the first proposal, used by the Government of the Netherlands, classifies innovation in the circular economy into three categories. The first refers to the intelligent use of products and manufacturing based on rethinking, rejecting and reducing the use of resources. The second includes extending product life through reuse, repair, remanufacturing, refurbishment and repurposing. The third includes the recycling and reuse of discarded materials (Van Hoof, Núñez and De Miguel, 2022, p. 17).

Some of the sectors to benefit are electricity generation, construction, manufacturing, and the drinking water and sanitation sectors (see box IV.2). Estimates show that, along with a reduction in the economy's material footprint, the carbon footprint—expressed as greenhouse gas emissions—decreases significantly in Chile and moderately in Colombia and Mexico. In Peru, circular economy targets serve as an economic driver, meaning that the impact on fuel reduction is offset by higher economic growth. Finally, the effect on imports is negative, with a -2% change in the countries analysed. Sectors reliant on materials of which use is reduced could contribute positively to GDP growth thanks to a decrease in their intermediate consumption. For this to happen, savings in raw material purchases must cover the costs of increased labour needs and the technological investment required to make these savings viable and sustainable.

Box IV.2

A circular economy approach to wastewater treatment is feasible and cost-effective in the region

One of the main sources of water pollution in the region is wastewater, only 40% of which is treated (UN-Water, 2021). The decomposing organic matter released in wastewater accounts for 10% of global emissions of methane, a gas that can pollute up to 80 times more than carbon. With this in mind, investment is needed to move towards circular uses of water in the supply and sanitation sectors. La Farfana, a wastewater treatment plant in Chile, for example, mobilizes technologies used in the circular economy to capture methane, generating profits of US\$ 1 million per year from the sale of this gas for electricity generation.

ECLAC has calculated that investments of US\$ 251 million are needed to install methane capture technology in 75 wastewater treatment plants serving 33 million people in 66 municipalities in Colombia, Costa Rica, Mexico, Peru and the Plurinational State of Bolivia.

The recovery and combustion of methane generated by an anaerobic treatment plant serving 300,000 inhabitants could produce electricity for 58,000 people per day, while a conventional aerobic activated sludge plant of the same volume would generate electricity for 19,000 people per day. Together, these 75 wastewater treatment plants could generate 360,725 MWh/year of electricity, equivalent to the annual consumption of 202,000 inhabitants. If the energy thus generated is used entirely in the plants themselves to replace fossil-fuel based sources, implementing these investments would save US\$ 46.6 million per year. Based on a 20-year horizon and discount rate of 12.28%,^a a net present income of US\$ 342.2 million would be obtained, which is much higher than the initial investment.

Moreover, every million dollars invested would create 38 green jobs. In terms of environmental benefits, methane emissions would fall from 107 million cubic metres to 13.1 million cubic metres, a reduction equivalent to 1.3 million tons of CO₂, or the emissions of 320,000 people in one year.

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

^a This is the discount rate recognized by the commission for the regulation of drinking water and basic sanitation of Colombia for public water and sewage service providers that serve more than 100,000 subscribers in urban areas.

In recent years, Latin American and Caribbean countries have designed or implemented public initiatives to move towards a circular economy (Martínez Cerna and others, 2022), albeit with a primary focus on waste management, recovery and recycling.¹⁸ These include national circular economy road maps and strategies, waste management policies,¹⁹ extended producer responsibility (EPR) laws, the promotion of material resource efficiency and recycling targets, as well as fiscal policies (taxes, incentives and elimination of subsidies) and certain product policies (ecological design, bans on non-reusable products and extensions of product lifetimes) (De Miguel and others, 2021).

A wide range of methodologies are used to measure resource consumption, emission reduction, the incorporation of renewable resources, increased material efficiency and increases in sustainability. These include

¹⁸ The Regional Program Energy Security and Climate Change in Latin America of the Konrad Adenauer Foundation indicates that initiatives in the region are mainly concentrated in programmes (25%), regulations (19%), projects (17%) and agreements (14%). These initiatives have created a propitious moment for the circular economy by coordinating public, private and civil society efforts. See [online] <https://survey.lesphinx.es/tiny/v/pVcU6BnM30>.

¹⁹ Waste management and treatment is still scarce (4.5% goes to recycling and 1% to composting and incineration) (Kaza and others, 2018). E-waste is the fastest-growing waste. Between 2000 and 2019, generation of electric and electronic waste in the region nearly tripled, from 3.4 kg per person per year to 8.8 kg.

material flow analysis, life cycle analysis and ecological footprint measurement based on the consumption of water, energy, soil and the generation of emissions (Van Hoof, Núñez and De Miguel, 2022). Other methodologies distinguish between different levels within the circular economy system, such as public policies and cities (macro level), geographic regions (eco-industrial parks), production chains (meso level) and business models in companies (micro level) (Ghisellini, Cialani and Ulgiati, 2016).

Most circularity indicator models focus on the environmental dimension of resource use and consider, to a limited extent, the social and economic dimensions at the business level. Indicator methodologies for decision making in circular economy business models are still in development (Yadav and others, 2020).

Van Hoof, Núñez and De Miguel (2022) propose indicators for the formulation of action plans to guide a transition to the circular economy in production chains in the region. The methodology includes various types of indicators to assess progress made by specific production chains in circular practices in a given geographical area: region, department, state, country or group of countries. It combines indicators measured by binary, discrete and continuous quantitative variables. The use of multiple indicators makes it possible to analyse the circular economy from every angle. The proposal is validated on the basis of case studies of value chains that are representative of the region's development needs, such as the agrifood chain in Argentina, the construction chain in Colombia and the automotive chain in Mexico.

The agrifood and construction chains were selected because they are mostly developed locally, including the raw material extraction phase, processing, distribution, consumption and end of life. The automotive chain was selected because it is part of a global chain with national and international operations. These three chains generate 7%–9% of the region's GDP and approximately 8%–17% of its greenhouse gases. All three chains have proven technology available for circularity and the costs involved to modify technology vary depending on the circularity model applied. The chains are prioritized in national, regional and local public policies and have certification standards for sustainability practices in the region.

In the automotive industry, for example, the focus is on the Automotive Cluster of Querétaro (see box IV.3), a component of the circular economy system in the Mexican state of the same name. This is an example of the design and implementation of a circularity strategy at the local level. The development of this chain is similar to that of a global one, with possible differences with local chains and its potential to drive new local businesses. Lessons that can be drawn from this experience can be applied to the considerations in the sections above on the growing importance of lithium batteries and progress in urban e-mobility.

Box IV.3

The Querétaro Circular Economy System

The Automotive Cluster of Querétaro is known for promoting increased competitiveness of the sector in the region, fostering the integration of local companies into supply chains and generating strategic information that facilitates decision-making in business. Many of the companies in the cluster engage in sustainability practices, with a primary focus on circularity.

In 2021, the foundation was laid for the Querétaro Circular Economy System, based on convening anchor and lead companies with the capacity to bring together other companies, suppliers, customers, partners and associates in order to cooperate in the circular economy. Initially composed of more than 40 companies and 5 local institutions, the cluster generated 42 circular economy projects with investments of US\$ 1 million and economic benefits of US\$ 4 million, in addition to social and environmental benefits. Once projects are launched, it takes 6–12 months to launch follow-up on implementation and multiplication. Currently in phase one of its scale-up, the system is managed by the Automotive Cluster of Querétaro and supported by an "institutional chain" of more than 50 representatives: State and municipal authorities, universities, research centres, clusters, business chambers and civil society organizations, with a central role played by the Secretariat of Sustainable Development. Nine supply chains have begun the learning process. Currently, over 100 companies from the automotive, aviation, food and agricultural industries take part, led by anchor organizations such as TREMEC, HARMAN, Dana, YanFeng, Automotive Cluster, Pilgrim's, Brose and BTicino and CANACINTRA San Juan del Río. The supply chains of TREMEC, HARMAN and Automotive Cluster of Querétaro have benefited from the implementation of the state's circularity programme.

Eight months after the Querétaro Circular Economy System was launched, its implementation rate stood at 58% and about 60% of participating companies reported that the calculated economic and socio-environmental benefits were accurate or even greater in practice. About 46% of organizations (from the 2021 phase) reported that they had expanded the methodology to the design of new circular economy projects, which translates into a high level of learning about circular models. Some 95% say they have imparted new knowledge to other stakeholders such as customers and companies in the same sector. Projects were financed by companies themselves in 84% of cases.

The system is set to include 1,000 companies by 2027 and reduce its environmental impact, mainly in terms of material, carbon footprint, energy and water use, and waste generation. Initial results include the recovery of 1,092 tons of waste per year, an annual 4,179-ton reduction in CO₂ emissions, and the recirculation of 50,457 cubic meters of water, thanks to waste recovery, closed-loop manufacturing, capacity-building and overhauling of business culture through cooperation between companies and suppliers (Estrella, 2021).

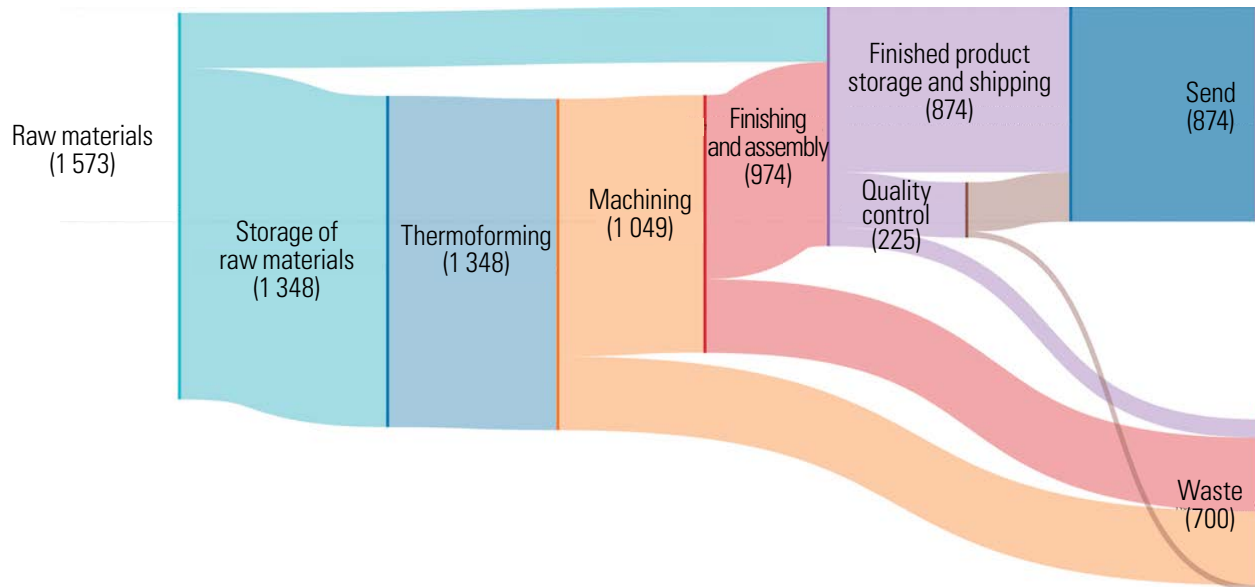
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Querétaro Circular Economy System, “Feria virtual”, n/d [online] <https://www.economicircularqro.mx/feria-virtual>.

In Mexico’s automotive sector, assembly operations consist of storing raw materials (generally imported from European countries), thermoforming, machining, finishing and assembly, quality control, finished product storage and shipping (see diagram IV.3). The process creates waste and loss, generally concentrated in the machining, finishing, assembly and quality control phases, which in turn present opportunities for circularity.

Diagram IV.3

Mexico: flows in the automotive chain

(Tons)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of B. Van Hoof, G. Núñez and C. de Miguel, “Metodología para la evaluación de avances en la economía circular en los sectores productivos de América Latina y el Caribe”, *Production Development series*, No. 229 (LC/TS.2022/83), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022.

Tier 1 suppliers are the best positioned to develop the circular economy in the automotive industry because they must comply with the stringent quality requirements and sustainability standards of the large assembly companies.²⁰ However, intervention and reinforcement in terms of business practices and sustainability are most needed for tier 2 suppliers as a link in the chain that has made no significant progress in sustainability (Blanco Jiménez and others, 2011).

²⁰ Automotive chains are ensured by three levels of suppliers: tier 1, which supply assembly parts to OEMs, tier 2, which supply assembly parts and by-products to tier 1 suppliers, and tier 3, which supply raw materials to tier 1 and tier 2 suppliers.

Incorporating circular factors such as tech design, materials and energy into e-mobility agendas will foster their success and ensure that the benefits of decarbonization are fully mobilized. Throughout the life cycle,²¹ this process involves the use of low-carbon materials and the integration of renewable energy networks for assembly and operations. Furthermore, the development of closed-loop supply chains, in which waste is reused and recycled, encourages local linkages. Supply chain infrastructure —the development of charging facilities, for example— also creates opportunities for investment and innovation (RAC, 2020).

Efforts to promote circularity in the automotive chain have included the design and implementation of management mechanisms, ranging from innovation in regulation to incentives, training and research, cooperation and information systems (see table IV.5).

Table IV.5

Mexico: circular economy management mechanisms for the automotive chain in the State of Querétaro

Circular economy management mechanisms	Description
Innovation in regulation	<ul style="list-style-type: none"> • General Law on the Circular Economy, prioritizing the sustainable management of water, energy and natural and industrial resources at the national level • Law on prevention, comprehensive management and the circular economy relating to waste in the state of Querétaro, for extended producer responsibility
Incentives	<ul style="list-style-type: none"> • Waste exchange programme promoted by the Secretariat of Sustainable Development, with inventory and supply of waste for exchange • Advantages for owners of electric cars in terms of pricing, parking and charging stations
Training and research	<ul style="list-style-type: none"> • Circular economy programme of Universidad Aeronáutica in Querétaro (UNAQ)
Cooperation	<ul style="list-style-type: none"> • Capacity-building programme for the Querétaro circular economy system
Information systems	<ul style="list-style-type: none"> • The Automotive Cluster as a leading information platform for Mexico's manufacturing industry • The national weather centre (CENAM) as a benchmark for minimum compliance standards for materials • The Tecnológico de Monterrey provides updates on progress in circular economy projects

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of B. Van Hoof, G. Núñez and C. de Miguel, "Metodología para la evaluación de avances en la economía circular en los sectores productivos de América Latina y el Caribe", *Production Development series*, No. 229 (LC/TS.2022/83), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022.

2. Policy recommendations

- **Consider** production chains and clusters, as groups of production chains, subjects of analysis rather than sectoral approaches in the framework of development programmes. The production chain perspective combines a variety of companies that together generate value based on a consumption need, along with other key actors from the public, academic and professional training sectors that influence value creation, employment and productivity.
- **Understand** that the circular economy requires comprehensive rather than partial solutions —that replace the specific interests and approaches of particular industrial branches— capable of enhancing the alignment and compatibility of the public policies implemented by various institutions. There is need of greater cooperation between companies for the efficient use of resources.
- **Implement** mechanisms that create a favourable environment for the transition to the circular economy in conjunction with public and private institutions. These mechanisms should be developed through platforms, with road maps that make it possible to align different interests, priorities and actions with a long-term perspective that outlasts changes of government in the region.
- In terms of **regulatory innovation**, regulations exist in the region that may limit the development of circularity in production chains, particularly environmental regulations for waste management and the reuse of treated water. Many regulations, some of them environmental, need to be adapted to technological progress to ensure environmental protection and human health based on circular solutions. Some, such as extended producer responsibility (EPR) standards, point in the right direction by promoting circularity and obliging suppliers to manage waste generated by the products that are put on the market.

²¹ The life cycle of vehicles and auto parts can be extended with efficient design, modularity, repair, reuse and remanufacturing.

- **Incentives** are needed to develop circular economy initiatives, such as building financing lines that recognize sustainability principles and criteria and that offer preferential rates and terms for investment capital, working capital and consulting services. The attraction of financial resources for private banks and development banks to promote circularity contributes to scaling up of sustainability practices. Other incentives include tax exemptions for the use of clean technology and carbon taxes that favour the use of renewable energy sources and decarbonization.
- **Technical guidelines, standards and certifications** to implement circular practices are a key component of promoting and scaling up the circular economy strategy in value chains. Technical guidelines can later become certification programmes for materials, products or services. Standards and certifications foster markets for recovered materials and help promote circular practices.
- In terms of **training and research**, there is need of considerable outreach initiatives among public and private sector actors, along with training. Creating a critical mass of capabilities helps generate research projects on material flows, required technologies and business plans to meet market and business requirements. Training and research programmes should promote entrepreneurship and provide support for the creation of new companies based on innovative business models.
- The development of **information systems** offers opportunities for different actors in the chains. Information on resource flows in value chains in the region is still limited, as is information on extraction, processing and marketing, both at the supervisory authority and company and trade union levels. Few companies publish information about the resources they consume in their annual reports and no consolidated databases are available. Estimates of resource use only appear at the aggregate level in national accounts and some sectoral accounts.

Progress in the development of circular models requires accurate information about the flow of resources consumed by companies. To this end, expanding material flow analysis at the company, chain and regional level is important. Globally standardized methodologies are recommended.

- **Coordination and cooperation** among stakeholders is important to move forward on action plans as part of a long-term productive transformation process, as recommended in the cluster approach. To a larger extent, successful systemic change will depend on the alignment of public policies at the various regional, national and international levels. No single mechanism will suffice to accelerate effective transition.
- **Trade agreements** are an opportunity to include principles and criteria that can later be incorporated into national, regional and local policies. Systemic change is possible when public policy recommendations are developed in an appropriate framework based on the particular needs of each region.

D. The bioeconomy: sustainable agriculture, genetic resources and bio-industrialization

1. Economic importance and characteristics of the bioeconomy

ECLAC considers the bioeconomy to be a driver of sustainable and inclusive growth.²² In particular, it highlights the contributions of the bioeconomy in diversifying production and adding value and knowledge as part of the big push for sustainability. Parallel to the subjects addressed in previous ECLAC publications (2020a and 2021h), this section highlights the contributions of the bioeconomy to food and nutrition security,

²² The bioeconomy includes production, use, conservation and regeneration of biological resources, as well as science, technology, innovation and related knowledge, to provide information, products, processes and services across all economic sectors with a view to creating a sustainable and inclusive economy (IACGB, 2018).

the transition to more sustainable agrifood systems and the sustainable use of biodiversity and genetic resources; to providing alternatives to synthetic fertilizers derived from fossil fuels; and, in general, to promoting bio-industrialization processes focused on productive diversification and high value added activities.

In 2015, in the 28 countries of the European Union, Kuosmanen and others (2020) estimated that the bioeconomy produced value added equivalent to 11% of GDP.²³ In Latin America and the Caribbean, ad hoc quantification exercises have been conducted for Argentina, Colombia and Uruguay. In Argentina, the bioeconomy was estimated to have represented 15.4% of GDP in 2012 (Wierny and others, 2015) and to have generated 2.47 million direct jobs in 2017 (Coremberg and others, 2019). In Colombia, it accounted for between 5.0% and 7.3% of GDP, depending on the estimation method (Alviar and others, 2021), and in Uruguay an estimated 14.2% of GDP came from the bioeconomy in 2018 (IICA, 2021). In Costa Rica, a first exercise to develop a bioeconomy satellite account within the System of National Accounts was conducted with the support of ECLAC, estimating that the bioeconomy accounted for 12.8% to 15.7% of the country's GDP in 2018 (Vargas and others, 2022).

Three elements stand out in the structure and evolution of bioeconomy exports in the region in comparison with global trends (see table IV.6).

- (i) Commodities form the bulk of the bioeconomy in the region and their importance has grown; they accounted for around 50% of activity in 2010–2014 and 55% in 2015–2019, with a noteworthy proportion of agricultural production activities. At a global scale, however, the weight of the commodity bioeconomy has remained stable at around 28%.
- (ii) The fastest-growing component at the global level is the diversification and high value added economy, the proportion of which increased from 19% in 2010–2014 to 21% in 2015–2019 and 24% in 2020, due to the increased importance of the biopharmaceutical sector in the context of the COVID-19 pandemic. This is the least important component in the region and its share decreased from around 7% in 2010–2014 to 4.5% in 2020.
- (iii) Globally, the increased prominence of the advanced bioeconomy has reduced the importance of the commodity processing bioeconomy. In the region, in turn, the larger share of the commodity economy has reduced the importance of the other two categories, in which higher value-added activities are concentrated.

Table IV.6

Latin America and the Caribbean: breakdown and evaluation of bioeconomy exports, by category and subperiod, 2010–2020 (Percentages)

Sectors	World					Latin America and the Caribbean				
	Breakdown			Variation		Breakdown			Variation	
	2010–2014	2015–2019	2020	2015–2019 vs. 2010–2014	2020 vs. 2015–2019	2010–2014	2015–2019	2020	2015–2019 vs. 2010–2014	2020 vs. 2015–2019
Bioeconomy: commodities	28.7	28.5	28.3	4.4	4.4	49.2	54.5	58.7	13.8	11.6
Raw materials	5.2	4.4	4.0	-10.9	-5.7	3.3	3.4	3.1	5.3	-5.3
Agricultural products	22.5	23.3	23.7	8.8	6.7	45.0	50.1	54.2	14.6	12.0
Natural fibres	0.9	0.7	0.7	-14.9	-8.3	0.9	0.9	1.4	6.7	55.3
Bioeconomy: commodity processing	52.6	50.9	47.5	1.7	-2.2	44.0	40.2	36.8	-6.1	-3.7
Wood industry	2.9	3.0	3.0	10.1	3.6	0.8	0.9	1.1	15.9	22.1
Pulp and paper	7.5	7.0	6.3	-2.0	-4.9	5.2	5.6	4.8	11.3	-11.3
Animal feed	2.6	2.5	2.6	3.1	9.7	8.2	7.5	6.5	-6.3	-9.3
Human food	21.5	21.5	21.9	5.3	6.6	22.9	20.5	20.5	-7.9	3.2
Textile and apparel industry	17.2	15.8	12.6	-3.4	-16.5	6.4	5.2	3.4	-17.0	-32.1

²³ This estimate is based on the 2018 European Commission definition of the bioeconomy, in a broad sense, as the production of renewable biological resources and the conversion of these resources and waste streams into value-added products, such as food, feed, bioproducts and bioenergy (Kuosmanen and others, 2020).

Sectors	World					Latin America and the Caribbean				
	Breakdown			Variation		Breakdown			Variation	
	2010–2014	2015–2019	2020	2015–2019 vs. 2010–2014	2020 vs. 2015–2019	2010–2014	2015–2019	2020	2015–2019 vs. 2010–2014	2020 vs. 2015–2019
Tobacco industry	1.0	1.0	1.0	9.6	4.1	0.5	0.5	0.5	8.9	2.7
Bioeconomy: diversification and value-added	18.7	20.6	24.2	15.5	23.4	6.8	5.3	4.5	-20.2	-11.8
Natural ingredients	2.0	2.0	2.1	6.1	9.4	1.1	1.2	1.1	9.2	-4.5
Bioenergy	1.1	0.7	0.9	-36.5	33.0	1.4	0.8	0.8	-40.8	-2.4
Natural fertilizers	0.0	0.0	0.0	3.9	14.1	0.0	0.0	0.0	-18.5	-11.3
Organic chemicals	0.6	0.6	0.6	1.9	3.6	0.2	0.1	0.1	-9.6	-5.9
Biocosmetics	3.1	3.7	4.0	26.6	13.5	1.9	1.5	1.3	-16.1	-13.5
Biopharmaceuticals	11.8	13.5	16.5	19.9	28.6	2.2	1.6	1.2	-26.5	-21.2
Bioeconomy: total	100.0	100.0	100.0	5.1	4.9	100.0	100.0	100.0	2.7	3.6
Share of total exports	16.1	16.2	18.2			33.9	36.6	46.4		

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Conference on Trade and Development (UNCTAD), UNCTADstat [online database] <https://unctadstat.unctad.org/EN/>.

These figures show that the process of export primarization has also occurred in the bioeconomy. Moreover, there is a notable contrast between trends in higher value-added activities (especially natural ingredients, organic fertilizers, organic cosmetics and organic pharmaceuticals), which grew significantly in the rest of the world but declined in the region.

Events such as the COVID-19 pandemic and the war in Ukraine have magnified the importance of food and nutrition security in the world and in the region. The pandemic has highlighted the fundamental and inseparable connection between the natural and human environment, as part of society's new expectations with regard to agriculture and food. These expectations can only be addressed by developing the bioeconomy, which contributes to ensuring food and nutrition security for the population, while improving the environmental sustainability of agriculture.

Much of the progress in the bioeconomy enabled by developments in life sciences and related fields (such as biotechnology and gene editing) contribute to food and nutrition security. Noteworthy examples include the development of more productive plant varieties that are better-adapted to environmental stresses such as salt content, humidity and heat; knowledge of soil microbiomes, including beneficial microorganisms and micronutrients; the development and application of bioinputs (see the section on fertilizers); the production of foods with tailored nutritional characteristics, such as biofortified foods and products for populations with different types of allergies, and new proteins to be used in food production. In terms of availability, such progress increases food production in a sustainable manner; in terms of use, it guarantees food's nutritional quality and safety; in terms of stability, it increases resilience to climate change and climate variability; and in terms of access, it enables diversification of food production to suit different consumer tastes and preferences.

2. The sustainable use of biodiversity and genetic resources

The framework for the sustainable use of biodiversity is provided by the 1992 Convention on Biological Diversity (CBD) and the 2010 Nagoya Protocol. CBD has three key objectives: (i) the conservation of biological diversity, (ii) the sustainable use of its components and (iii) the fair and equitable sharing of the benefits arising out of the utilization of genetic resources (access and benefit sharing (ABS)). Issues related to the use of genetic resources are addressed by the Nagoya Protocol, the objective of which is "the fair and equitable sharing of the benefits arising from the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding, thereby contributing to the conservation of biological diversity and the sustainable use of its components" (Secretariat of the Convention on Biological Diversity (2011)). The International Treaty on Plant Genetic Resources for Food and Agriculture (2001) is also relevant.

The Nagoya Protocol highlights the monetary and non-monetary benefits derived from access to genetic resources (Secretariat of the Convention on Biological Diversity, 2011, annex). Much of the attention paid

to benefit sharing has focused on monetary aspects, but non-monetary benefits can be just as important, if not more so. For example, the benefits stemming from the generation and transfer of knowledge and technology can help support conservation activities, such as the protection and recovery of endemic and endangered species.

An important concept in the Nagoya Protocol is traditional knowledge associated with genetic resources, which highlights the sociocultural component of biodiversity; for example, traditional knowledge associated with medicinal plants. However, the distinction between countries that are providers and users of genetic resources is outdated, since many provider countries, such as Argentina, Brazil and Mexico in the region, are also users, in possession of the scientific and technological capabilities based on which the distinction was traditionally made.

Therefore, it is important to reconcile the recognition of the “close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components” (United Nations, 1992), with the objective of “promoting and advancing priority access on a fair and equitable basis by Contracting Parties, especially developing countries, to the results and benefits arising from biotechnologies based upon genetic resources provided by those Contracting Parties” (United Nations, 1992, Art. 19 No. 2).

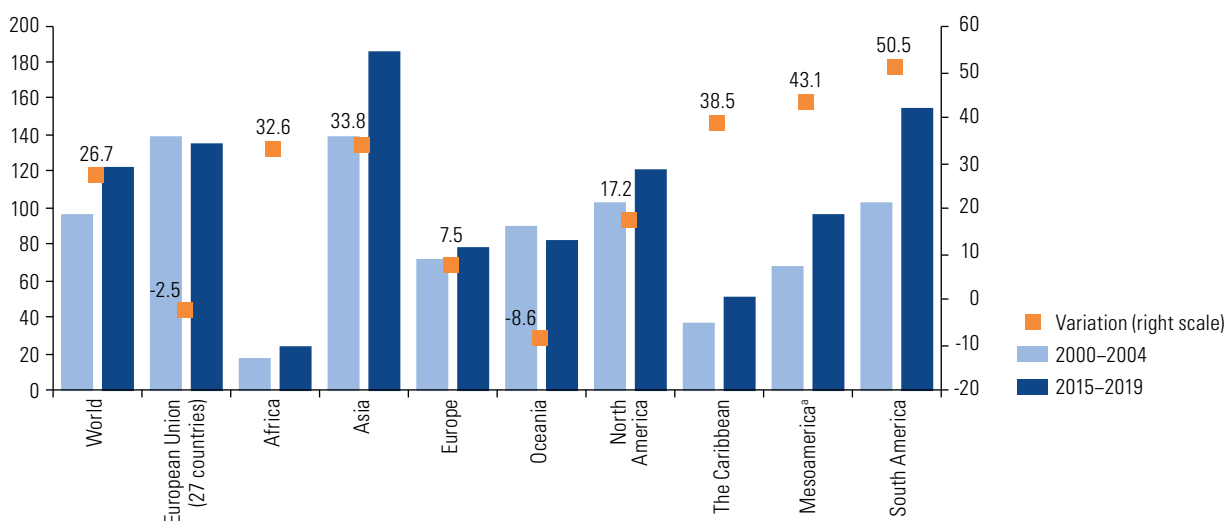
3. Synthetic fertilizers and organic fertilizers

(a) Dependence on synthetic fertilizers

Around the world, fertilizer use increased 26.7% between 2000–2004 and 2015–2019, from 96.5 to 122.3 kilograms per hectare of cultivated land (kg ha^{-1}), albeit with marked regional differences. The regions that used the most fertilizers on average in the 2015–2019 period were Asia (186 kg ha^{-1}), South America (154 kg ha^{-1}), the European Union (135 kg ha^{-1}) and North America (121 kg ha^{-1}). South America, the fourth biggest user in 2000–2004, behind the European Union, Asia and North America, ranked second in 2015–2019. In fact, the subregions of Latin America and the Caribbean show the highest rate of increase between the two periods: 50% in South America, 43% in Mesoamerica²⁴ and 38% in the Caribbean (see figure IV.12).

Figure IV.12

Intensity of fertilizer use and variation in the world and its regions, 2000–2004 compared to 2015–2019
(Kilograms per hectare of cropland and percentage variations)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Food and Agriculture Organization of the United Nations (FAO), FAOSTAT [online database] <https://www.fao.org/faostat/en/#home>.

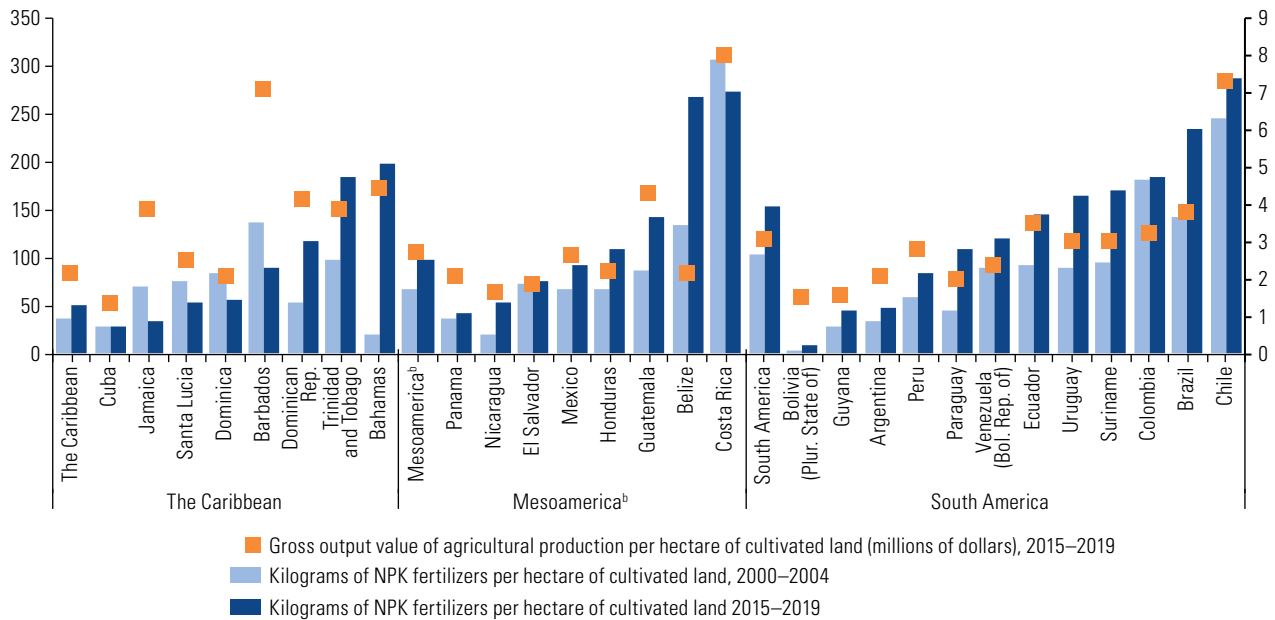
^a Mesoamerica refers to the subregion comprising Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama.

²⁴ Mesoamerica refers to the subregion comprising Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama.

A reduction in the use of fertilizers could affect production and revenues in the region, where the relationship between fertilizer use and the gross output value of agricultural production is fairly direct (see figure IV.13). Among the 28 countries included in the analysis, the only exceptions to the trend are Barbados, Belize and Jamaica. The most illustrative cases are Chile and Costa Rica, both of which record the most intensive use of fertilizers (in kilograms per cultivated hectare) and the highest gross output value (in millions of dollars per cultivated hectare). Overall, in the region, the proportion of fertilizers used in the agricultural sector that were imported increased from 77.6% in 2000–2004 to 85.9% in 2015–2019. The increase was largest in South America, where this share grew from 75.5% to 87.5%.

Figure IV.13

Latin America and the Caribbean (28 countries): intensity of fertilizer use^a and agricultural gross output value, 2000–2004 and 2015–2019
(Kilograms and millions of constant dollars at 2014–2016 prices per cultivated hectare)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Food and Agriculture Organization of the United Nations (FAO), FAOSTAT [online database] <https://www.fao.org/faostat/en/#home>.

^a Refers to total nitrate (N), phosphate (P) and potassium (K) fertilizers.

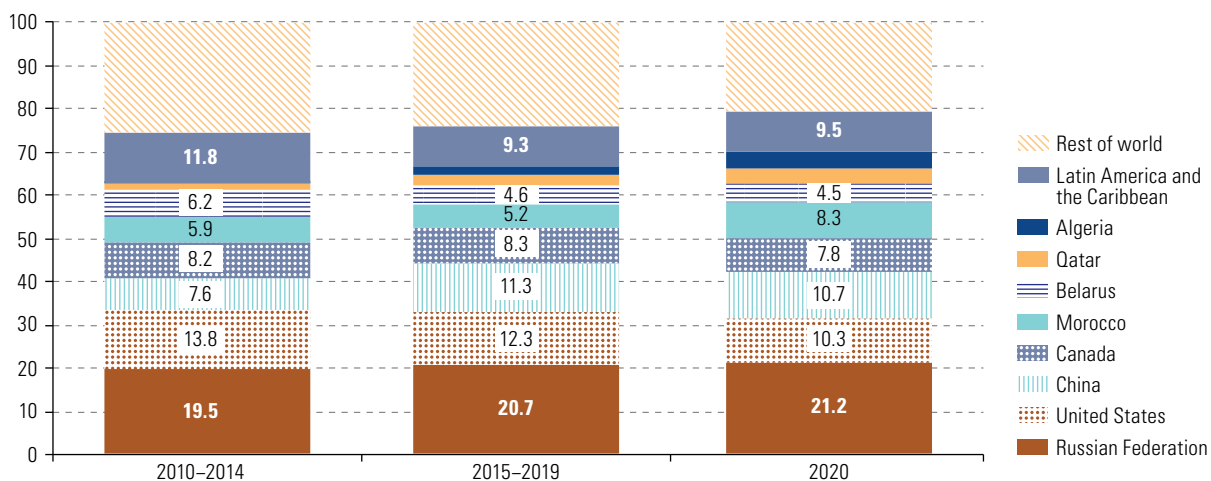
^b Mesoamerica refers to the subregion comprising Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama.

The conflict between the Russian Federation and Ukraine has exposed the region's dependence on fertilizer imports from the former. The Russian Federation supplies around one fifth of the region's fertilizer imports, a share that has remained stable over the last ten years. Other important suppliers are the United States (around 12% of imports), China (between 8% and 11%), Canada (around 8%), Morocco (around 6% to 8%), and Belarus (between 5% and 6%). In the 2015–2019 period, these countries provided 62% of the region's total fertilizer imports. More detailed information by fertilizer type is found in figure IV.14.

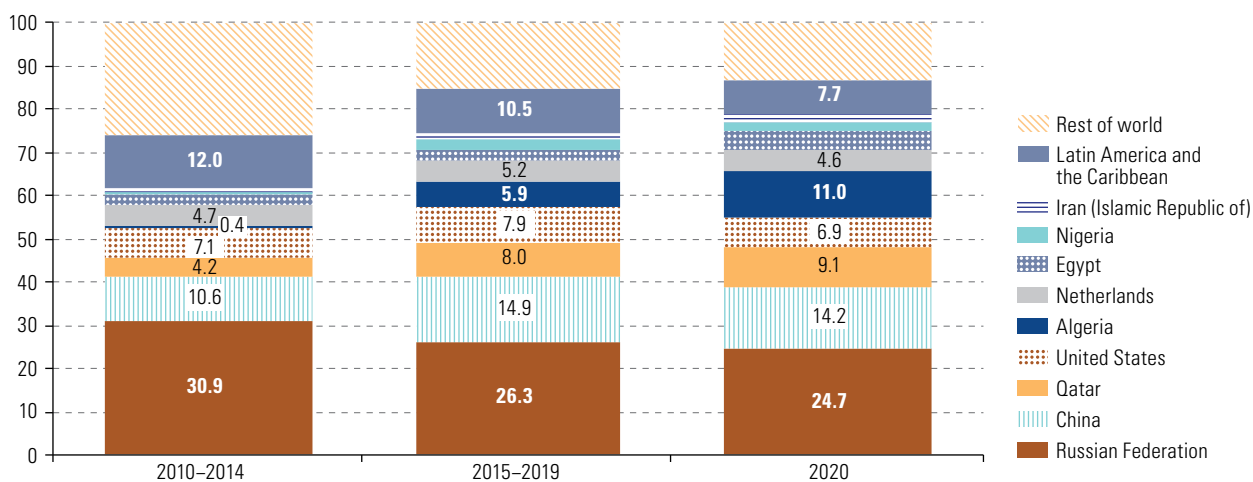
One way to reduce dependence on fertilizer imports is to diversify suppliers. Statistical data in this regard are mixed and differences exist depending on the type of fertilizer nutrient. In terms of new suppliers, Algeria and Nigeria are becoming more important for nitrates, and Egypt for phosphates. In the case of potassium-based fertilizers, imports are more concentrated in terms of source country, with three countries (Canada, Belarus and the Russian Federation) accounting for over 60% of imports between 2010 and 2020: Canada (around 29%), Belarus (around 19%) and the Russian Federation (around 14%).

Figure IV.14
Latin America and the Caribbean: fertilizer imports by country of origin and composition, 2010–2020
(Percentages)

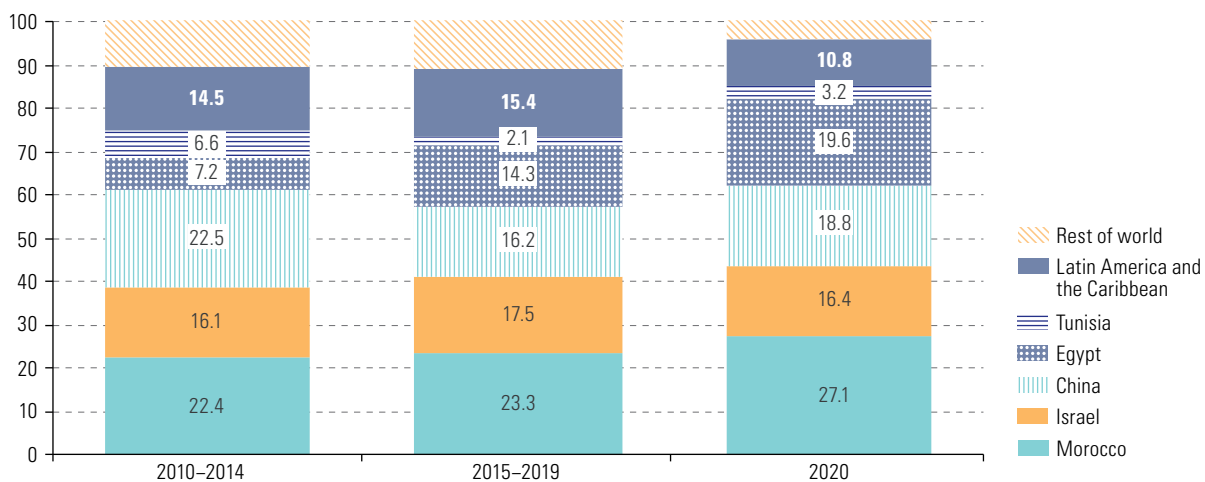
A. Total fertilizers



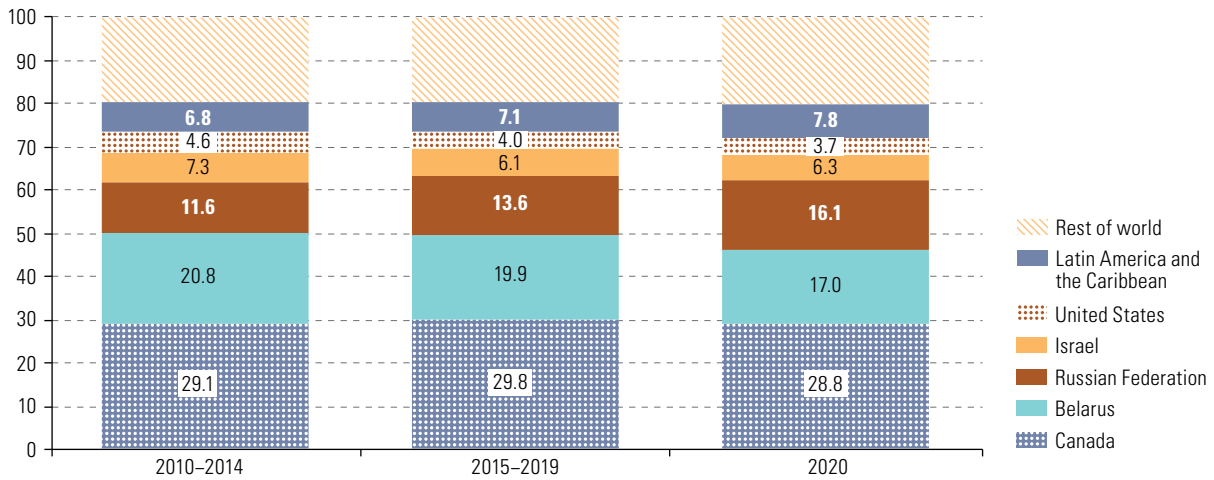
B. Nitrogen fertilizers (N)



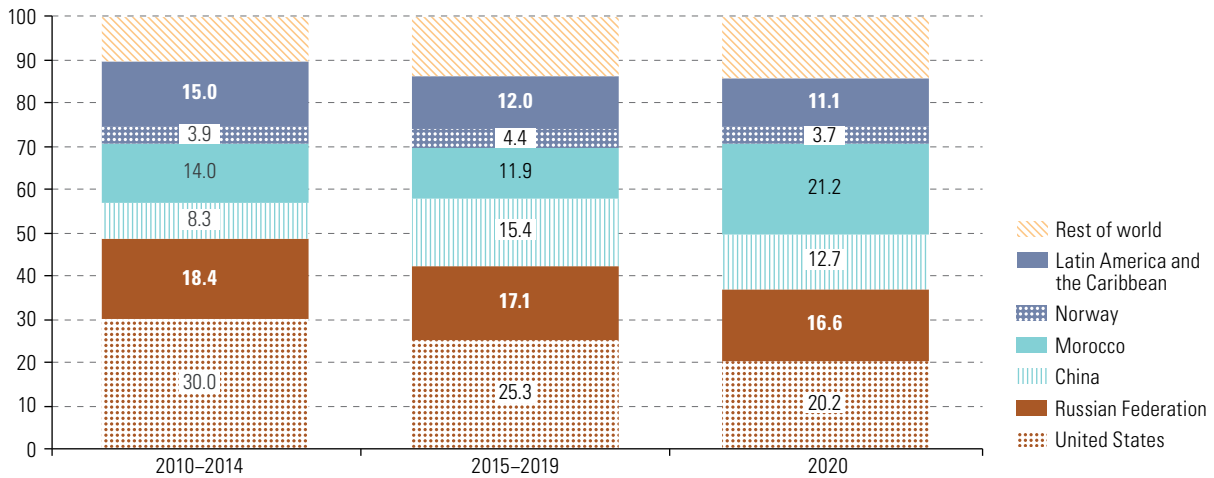
C. Phosphate fertilizers (P)



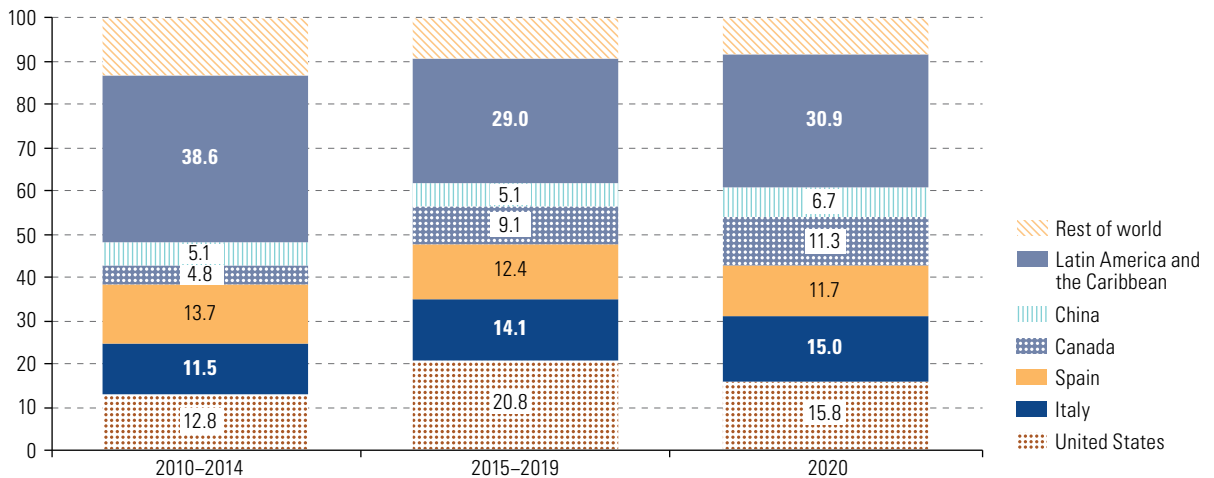
D. Potassium fertilizers (K)



E. Fertilizers with two or more components, others



F. Natural fertilizers



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from United Nations International Trade Statistics Database (UN Comtrade), available on World Integrated Trade Solution (WITS) [online] https://wits.worldbank.org/about_wits.html.

There are notable differences in the nature of synthetic and natural fertilizer imports. Two features are particularly noteworthy. First, no country in the region affected by the conflict between the Russian Federation and Ukraine is a supplier of natural fertilizers to Latin America or the Caribbean. Second, intraregional trade in natural fertilizers exceeds that of synthetic fertilizers. Among the Latin American countries that supplied the most natural fertilizers to the region in 2020 were Chile (7%), Mexico (4.3%), Brazil (3.7%), Peru (1.6%), and Argentina (1.2%).

The use of chemical inputs in farming has made it possible to increase yields and meet the growing demand for food; however, excessive use has contributed to air and water pollution, soil nutrient depletion and increased greenhouse gas emissions (Thomas and Singh, 2019; Kaur and Purewal, 2019). In addition, poorly monitored use of such inputs can affect human health, both for agricultural workers—when applying the products—and for consumers if traces are present in products, and fresh food especially. Biological inputs are an alternative that can reduce these negative effects and the reliance on chemical inputs.²⁵

Biofertilizers are the best known bioinputs. Depending on their use, they are classified as inputs used to either fix nitrogen, solubilize phosphate, potassium and zinc, or sequester iron (Abbey and others, 2019). Among the benefits of using biofertilizers are soil regeneration and the improvement of its biota, organic content and its potential for protecting against drought and soil diseases, all relevant factors in a context of climate change (Gupta, 2021).

The biofertilizer market is expanding significantly. The global market for these products, valued at US\$ 1.8 billion in 2018, grew at a compound average annual rate of approximately 14.3% between 2011 and 2018 (Kumawat and others, 2021). This market could grow at a compound average annual rate of 13% between 2021 and 2030 to reach a value of US\$ 4.7 billion. Nitrogen fixers, the largest segment, constituted an estimated 55% of this market in 2020. Growth is driven by a rise in organic farming practices, the need to improve the organic content of soil, a favourable regulatory environment, and the introduction of comprehensive pest management programmes that promote the use of biofertilizers (The Brainy Insights, 2022).

The use of biofertilizers is held back, however, by a lack of information that translates to lower uptake by farmers. Their application is still limited to certain crops and certain locations, as microorganism action depends on the type of plant and specific characteristics of the site where they are applied. Because biofertilizers include live microorganisms, they be affected by the death of those organisms or become ineffective, for example, due to fluctuations in temperature. Other limitations arise with regard to packaging, labelling and price marking practices that can cause product damage and losses for farmers. The quality of biofertilizers depends not only on the type of microorganisms used, but also on the quality of the carrier materials used to transfer active components, the availability of which is essential in their production (Gupta, 2021).

A recent assessment conducted in Mexico (*La Jornada*, 2022) determined that using biofertilizers can reduce the need for conventional synthetic fertilizers by up to 50% and bring down wheat and corn production costs by around 15% and 20%, respectively. Other studies in Mexico have identified positive effects in combining biofertilizers with synthetic fertilizers on the production of grain and forage from hybrid maize (Ayvar-Serna and others, 2020), on the production of sunflower, especially in less saline soils (Aguilar Carpio, 2021) and on the production of wheat in clay soils (vertisols) (Báez-Pérez and others, 2020).

Brazil stands out in the region for the highest rate of uptake of bioinputs; in 2020 biopesticides were used on around 2 million hectares in the country and biofertilizers (bacteria that promote plant growth) on around 40 million hectares (AgriBio, 2020). In 2020, 275 biopesticides were registered with the Ministry of Agriculture, Livestock and Supply of Brazil, including bioacaricides, bioinsecticides, biofungicides and bioinputs to control ants, as well as 321 inoculants, bioinputs that contain microorganisms that benefit plant growth (Ministry of Agriculture, Livestock and Supply of Brazil, 2020).

²⁵ Agricultural biological inputs are products made from living organisms or their derivatives. These include helpful microorganisms and bioactive extracts or compounds obtained through biotechnological processes. Some examples are organic fertilizers, biopesticides, bioinoculants, bio-stimulants, biostabilizers and biocontrollers (Abbey and others, 2019). Of particular note are microbial inoculants, which can be used as biofertilizers, bioherbicides, biopesticides and biocontrol agents (Sansinenea, 2021).

Given that substituting a significant portion of synthetic fertilizers with biological alternatives will take time, synthetic inputs will continue to play an important role in ensuring global food security and improving human nutrition. They must be used with the aim of increasing crop yields and meeting environmental and health objectives, properly adapting usage based on soil information. The agroecological transition calls for the highly efficient use of all available organic and inorganic nutrient sources tailored to the specific features of food systems and agroecosystems in different world regions (Doberman and others, 2022). To this end, it is important to develop sustainability-driven nutrient road maps based on the best available scientific data, as well as to adopt digital crop nutrition solutions, recover and recycle nutrients, develop climate-smart fertilizers and accelerate innovation. Moreover, available data (in Mexico, for example) indicates that often the best results are obtained by combining both types of fertilizers (Ayvar-Serna and others, 2020; Aguilar Carpio, 2021; Báez-Pérez and others, 2020).

4. Opportunities for bioindustrialization

The bioeconomy provides a suitable framework in which to develop policies for gradual structural change for three reasons: (i) biological resources are a key driver of new production activities and value chains, which are intensive in knowledge and new technologies; (ii) the bioeconomy fosters bioindustrialization through the production of goods and services in rapidly expanding market segments, including bioplastics, biomaterials, agricultural bioinputs, biopharmaceuticals, biocosmetics, bioremediation systems, biodiagnosis and biomonitoring services, and (iii) new activities boost production and employment, since many depend on regionally-specific biological resources that provide alternatives for diversifying production and adding value in rural areas, especially in the farming and agro-industrial sectors. Table IV.7 presents growth forecasts for certain sectors of the high value added bioeconomy in the current decade.

Table IV.7

Estimates of market growth in different sectors of the high value added bioeconomy

Area	Period	Compound average annual growth rate	Source
Biotechnology: global	2022–2029	17.5% (from US\$ 1.00 trillion to US\$ 3.09 trillion)	Research and Markets, <i>Biotechnology Market</i> , 2021 [online] https://www.researchandmarkets.com/reports/5261865/biotechnology-market-share-size-trends-and#rela4-4396357
Biotechnology: global	2022–2030	13.9% (from US \$1.02 trillion to US\$ 3.30 trillion)	Grand View Research, <i>Biotechnology Market</i> , n/d [online] https://www.grandviewresearch.com/industry-analysis/biotechnology-market
Organic fertilizers	2021–2030	12.9% (from US\$ 1.40 billion to US\$ 4.70 billion)	The Brainy Insights, <i>Global Biofertilizers Market</i> , 2022 [online] https://www.thebrainyinsights.com/report/biofertilizers-market-12641
Biopharmaceuticals	2020–2030	12.8% (from US\$ 291.40 billion to US\$ 974.50 billion)	Next Move Strategy Consulting, <i>Biopharmaceuticals Market</i> , 2022 [online] https://www.nextmsc.com/report/biopharmaceutical-market
Biotechnological ingredients	2019–2027	9.3% (from US\$ 1.61 billion to US\$ 2.28 billion)	Grand View Research, <i>Biotech Ingredients Market</i> , n/d [online] https://www.grandviewresearch.com/industry-analysis/biotech-ingredients-market
Biotechnology and pharmaceutical services	2022–2030	5.5% (from US\$ 70.50 billion to US\$ 108.00 billion in 2030)	Research and Markets, <i>Biotechnology & Pharmaceutical Services Outsourcing Market</i> , 2022 [online] https://www.researchandmarkets.com/reports/5505273/biotechnology-and-pharmaceutical-services#rela3-4396357
Biocosmetics and personal care ingredients	2019–2028	5.18% (from US\$ 3.51 billion to US\$ 5.25 billion)	BIS Research, <i>Global Bio-Based Cosmetics and Personal Care Ingredients Market – Analysis and Forecast, 2019-2029, 2020</i> [online] https://bisresearch.com/industry-report/bio-based-cosmetics-personal-care-ingredients-market.html

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Research and Markets [online] <https://www.researchandmarkets.com>, BIS Research [online] <https://bisresearch.com>, Grand View Research [online] <https://www.grandviewresearch.com>, BlueWeave Consulting [online] <https://www.blueweaveconsulting.com>, Next Move Strategy Consulting [online] <https://www.nextmsc.com>, and The Brainy Insights [online] <https://www.thebrainyinsights.com>.

Innovations based on re-use of biomass waste and the sustainable use of biomass in general, as well as from biodiversity, can be starting points for new industrialization processes, thus promoting alternative routes in the transition from fossil fuel-based development to knowledge-based bioeconomies.

The re-use of agro-industrial waste is another way to develop new products and create opportunities for bioindustrialization that extend beyond bioenergy production. The use of new technology to extract valuable

components from agro-industrial waste has been explored in the pharmacological sector, for drug delivery systems and nutritional pharmacology applications, for example. Agro-industrial waste can also be used in food production as a source of ingredients like antioxidants and functional components. Lignocellulosic compounds from agro-industrial biomass waste can be used to synthesize bioaerogels, biofilms, bionanocomposites and hydrogels for biomaterials used in biomedicine, engineering and pharmaceuticals (Freitas and others, 2021). Potential exists in the region, where there are chains that generate large quantities of biomass waste that is difficult to dispose of, as well as being undervalued (Fiallos-Cárdenas, Pérez-Martínez and Ramírez, 2022).

The biocosmetics and biopharmaceutical chains also hold potential in the region. Biocosmetics are cosmetic products composed of 100% natural ingredients derived from plants, animals, microbes, enzymes, insects and organic crops. They are an alternative to conventional cosmetics that contain petroleum- or mineral oil-based ingredients, which can be harmful and are non-biodegradable (Goyal and Jerold, 2021). This area has high potential, as evidenced by the high growth rates in the international trade of bioproducts (see table IV.6). Biopharmaceuticals consists of application of a living organism or active ingredient extracted from a biological system in its original—or a genetically modified— form to prevent, alleviate or treat disease. Humira (a drug used to treat moderate to severe rheumatoid arthritis in adults), Lantus (a brand of long-acting insulin), Enbrel (an anti-inflammatory drug used to treat rheumatoid and juvenile idiopathic arthritis) and Botox are the most popular biopharmaceuticals dominating the global drug market today (Behera, Prasad and Behera, 2020). International trade in biopharmaceuticals has also recorded high rates of growth.

The bioeconomy also provides alternative routes for agricultural development. One example is molecular farming, based on the use of plants as bioreactors to produce recombinant protein products (Fischer and Buyel, 2020). Molecular farming is a practical and safe approach to cost-effective, large-scale production of therapeutic biomolecules; cereals, for example, are popular raw materials in the production of high-value recombinant proteins (Mirzaee and others, 2022). Innovations are being applied in Argentina through use of plants such as tobacco, alfalfa and potato as bioreactors (Mirkin and Segretin, 2015).

5. Policies for the use of genetic resources and the production of agricultural bioinputs

(a) Genetic resources

The discussion on biological resource access and benefit-sharing (ABS) is relevant to the development of the bioeconomy, particularly in areas related to knowledge creation and its application in high value added products. Examples include biotechnology applications in agriculture such as the development of bioinputs and genetic improvements adapted to climate change; agribusiness and the use of secondary metabolites in plants; and pharmacology, including drug development. This is particularly relevant in Latin America and the Caribbean, a region recognized worldwide for its extensively rich and interconnected biological and cultural diversity and the cradle of origin and domestication of countless species that are cultivated and used for food or medicinal purposes.

The Nagoya Protocol does not establish a strict framework for the implementation of ABS, resulting in considerable discretion being employed. This ample leeway in interpretation limits cooperation and the standardization of procedures, for example, in terms of access requirements and benefit-sharing arrangements. Other obstacles to the application of the ABS mechanism are the complexity of the technical and legal terms used, the limited human and institutional capacity for its design and implementation, and the exclusion of stakeholders in decision-making processes. Issues surrounding the governance of genetic resources have been the focus of controversy and disagreement in the negotiations of the Convention on Biological Diversity (CBD), the global multilateral benefit-sharing mechanism, and now the post-2020 global biodiversity framework.

Another unresolved dispute between parties to CBD concerns access to DNA or RNA digital sequence information derived from genetic resources, which is a modern alternative to conventional physical access, facilitated by advances in genomics and bioinformatics (Chege Kamau, 2022). Many factors inform the debate surrounding digital sequence information, notably the issue of how open sequence access should be, given that the Nagoya Protocol recognizes the sovereign right of countries to regulate access to genetic resources. In an

effort to overcome the difficulties inherent in the Nagoya Protocol, a group of scientists and members of the DSI Scientific Network have developed a proposal for the creation of a multilateral benefit-sharing framework for sequences based on five fundamental objectives: (i) open access, to foster knowledge generation and capacity building; (ii) simplicity, to avoid overregulation of a highly complex system; (iii) harmonization, particularly with respect to other benefit-sharing frameworks; (iv) biodiversity conservation and sustainable use to incentivize and reward biodiversity knowledge generation; and (v) fairness by creating equitable conditions for providers and users (Scholz and others, 2022).

Implementation of the ABS legal framework varies from country to country in the region: 18 countries have signed and ratified the Nagoya Protocol and established national legislation on access to genetic resources and associated traditional knowledge.²⁶ A heterogeneous and complex system of access regimes poses a growing problem for proper implementation of Protocol. In addition, certain countries have not ratified the Protocol and already have ABS mechanisms in place, such as Costa Rica (Cabrera Medaglia, 2022). Regional-level legislation also exists, such as Decision 391 of 1996 of the Andean Community (CAN) on a Common Regime on Access to Genetic Resources, cited for its complexity and regulatory excess and the disproportionate power it gives to member States in relation to users (Cabrera Ormaza, 2022). Taken together, these factors represent significant challenges to articulation.

(b) Development and use of bioinputs

For years now, several countries in the region have pursued initiatives to develop bioinputs as an alternative or supplement to the use of conventional chemical inputs.

Argentina has a national development strategy for agricultural bioinputs, the culmination of a process launched in 1999, with Resolution 350/99 to establish the conditions for incorporating biocontrols into the pesticide registry, and Resolution 264/11 of 2011 for biofertilizers. In terms of research and development, in 2013 Resolution 7/2013 established an advisory committee on agricultural bioinputs (CABUA) to provide technical advice on quality, efficiency and biosafety requirements for agricultural bioinputs, and to establish an appropriate regulatory framework for their use, handling and disposal in the ecosystem. In terms of incentives, in 2015 a programme to promote the use of agricultural bioinputs (PROFOBIO) was developed with the objective of familiarizing producers with bioinputs and providing financial support to promote uptake. In the private sector, an Argentine chamber of bioinputs (CABIO) was created in 2017 with the aim of positioning this sector as foundational in the development of efficient, low-impact agriculture that provides good yields and serves as a basis for sustainable production. CABIO consists of companies that develop and sell bioinputs as well as public institutions and agencies (Starobinsky and others, 2021). In addition, the Argentine Bioproduct Seal, granted by the Ministry of Agriculture, Livestock and Fisheries, is awarded to biomaterials and bioproducts that are made from renewable raw materials and stand out for their innovation and contribution to sustainability.²⁷

The lines of action of Argentina's strategic plan for the promotion of bioinputs (Starobinsky and others, 2021), given their comprehensiveness, make them a model for the development of similar initiatives in other countries in the region. In terms of supply, they cover research, development, knowledge transfer and promotion of entrepreneurship, as well as production and exports. In terms of demand, they encompass the areas of awareness-raising, training, and incentives, and in terms of regulation, they cover issues related to registration and quality control—two elements considered fundamental for producers to ensuring stable product quality. On 10 October 2022, *the Programa Nacional Biotecnología Argentina* (Biotecnología Argentina) was launched to promote the development, innovation and adoption of bioproducts in the areas of biotechnology, bioinputs, biomaterials and bioenergy.²⁸ In addition, the strategic plan for organic production in Argentina 2021-2030 seeks to foster research, create incentives and increase the volume of organic agricultural production and the number of producers engaged in organic agriculture.²⁹

In Brazil, a national bioinputs programme was established by Decree No. 10375 and Ordinances Nos. 102 and 103 of May 2020 with the objective of mobilising the country's rich biodiversity and promoting the use of biological resources in agriculture to reduce its dependence on imported inputs.³⁰ The programme proposes

²⁶ Antigua and Barbuda, Argentina, Bahamas, Brazil, Cuba, Dominican Republic, Ecuador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Peru, the Plurinational State of Bolivia, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Uruguay.

²⁷ See [online] <https://www.argentina.gob.ar/agricultura/sello-bioproducto-argentino>.

²⁸ See [online] <https://www.argentina.gob.ar/normativa/nacional/resoluci%C3%B3n-63-2022-372752/texto>.

²⁹ See [online] https://alimentosargentinos.magyp.gob.ar/HomeAlimentos/Organicos/_pdf/Plan_Estrategico_Argentina_Organica_2030.pdf.

³⁰ See [online] <https://www.gov.br/agricultura/pt-br/assuntos/inovacao/bioinsumos/o-programa/>.

to: (i) update bioinput-related regulation; (ii) promote best practices in the production and use of bioinputs and ensure their continuous and sustainable improvement; (iii) promote regular campaigns to encourage the use of bioinputs; (iv) create and maintain a database of updated information on bioinputs and related topics; (v) support the creation of businesses specialized in bioinput production and production sites; (vi) incentivize research, development and innovation in bioinputs, and (vii) incentivize the adoption of sustainable production systems that ensure an adequate use of bioinputs and increase producer incomes, such as organic production systems and those based on agroecology, agroforestry, zero-tillage, degraded pasture recovery, integrated crop-livestock-forestry (ICLF) and sustainable aquaculture. A strategy council was created for the national bioinputs programme, to provide governance and represent the public and private sectors and civil society. The council's secretariat is the Ministry of Agriculture, Livestock and Supply. A national bioinputs observatory was also established (Government of Brazil, 2020).

In Chile, a Chilean Bioinputs Network was created in 2014 by a group of professionals from different sectors of the bioinput market,³¹ including researchers, manufacturers, consultants, farmers, laboratories and government bodies. The network operates on the basis of regional assemblies and commissions for technical matters, awareness raising, training, services and financing.

In Mexico, one noteworthy initiative is the Mexican platform for bioinput producers, which brings together the sector's producers, government institutions and research institutions.³² The platform operates a portal where farmers can find information on different bioinputs and products, by state and crop type.

Argentina and Brazil are two cases that illustrate the importance of public policy in promoting the development of a strategic industry for the sustainability and growth of their agricultural sectors, while developments in Chile and Mexico highlight the central role of public-private partnerships and the agricultural science and technology sector. The development of a bioinput industry is strategic not only for the role it plays in reducing a country's reliance on imported synthetic fertilizers and promoting sustainable agricultural production but as a means to diversify production in a rapidly growing sector. Such development is also strategic from a regional point of view. Intra-regional trade in biofertilizers is extensive, for example (see figure IV.14). The four largest producer countries (Argentina, Brazil, Chile and Mexico) are among the top five exporters of organic fertilizers to other countries in the region.

Regional cooperation is also strategic, particularly with regard to nomenclature, registration requirements, standards, biosafety and quality control, to prevent conflicting national laws that could limit intra-regional trade. Since bioinputs contain live organisms, regional cooperation is vital, to ensure their safety in terms of human, animal and plant health, as well as their capacity to improve crop nutrition. It is also important to foster regional cooperation in research and development and knowledge transfer in light of structural discrepancies across the region in terms of capabilities and resources. Cooperation to strengthen capacities in areas such as soil microbiology would support the study of microbiomes and identification of beneficial microorganisms with the greatest potential for different kinds of crops.

E. Health-care manufacturing industry: progress towards self-sufficiency in health matters

1. How regional priorities have evolved amid the COVID-19 pandemic

In early 2020, when vaccines against COVID-19 were not yet available, the countries of Latin America and the Caribbean were most concerned about access to essential products to prevent infection (e.g. masks and face shields) and medical equipment to treat the sick requiring intensive care, such as mechanical ventilators.

³¹ See [online] <https://bioinsumos.cl/>.

³² See [online] <https://bioinsumos-agricultura.mx/>.

The sudden disruption of international supply chains for these products, coupled with the region's heavy dependence on imports from the rest of the world, worsened the already worrying health situation caused by the spread of the pandemic in the region.

In 2020, there was a race to develop a vaccine against COVID-19 that produced results extremely quickly. The first vaccines were available for emergency use starting in June and August 2020 in China and the Russian Federation, respectively, and in December in Europe and the United States. Thus, as supply chains for medical devices and personal protective equipment gradually stabilized, the region's governments shifted their focus to access to vaccines. In the period when international laboratories were just increasing their production capacities, purchase commitments were dominated by developed countries. For example, in January 2021, the European Union, the United States, the United Kingdom, Canada and Japan, which together represent 12.9% of the world's population, accounted for 48.4% of purchase commitments.

Difficulties in accessing vaccines resulted in a slow and uneven inoculation process in most of the region's countries. By the end of January 2021, only 2% of the doses distributed worldwide had been received, and only nine countries had begun the vaccination process. Since then, the region has made significant progress. As of 20 May 2022, over 68% of the population had been fully vaccinated, a figure similar to that of the United States and only five percentage points below the European Union average. However, there are significant differences between subregions and countries. As of the same date, only 10 countries in the region had fully vaccinated 70% of their population, and in the Caribbean (excluding Cuba and the Dominican Republic) only 15.4% of the population had been fully vaccinated. Meanwhile, the state of health alert remains in effect because of the risk of the emergence of new mutations of the virus and the gradual loss of acquired immunity after the initial vaccine doses.

In short, the pandemic underscored the region's health, economic, social and productive vulnerabilities. Critical episodes of lack of access to medical equipment and then to vaccines stemmed not only from asymmetries in access for developed and developing countries, but also from long-standing structural problems, in particular the insufficient development of regional productive capacities in the health-care manufacturing industry. It was against this backdrop that in March 2021, the government of Mexico, in its capacity as pro tempore Chair of the Community of Latin American and Caribbean States (CELAC), requested of ECLAC to develop a regional plan for self-sufficiency in health matters aimed at strengthening capacities to produce and distribute vaccines and medicines in the region. The main contents of this plan and the results of its implementation to date are detailed in part 3 of this section, and are preceded by a brief overview of the region's health-care manufacturing industry that complements and updates the analysis presented by ECLAC (2020a).

2. Characteristics and recent performance of the regional pharmaceutical industry

In the region, as in the rest of the world, the pharmaceutical industry is characterized by high labour productivity and reflects innovation capacity linked to a larger proportion of skilled workers and higher wages than the manufacturing industry average. The share of women employed in the pharmaceutical industry is also larger than the manufacturing industry average, as is the share of output destined for the domestic market (see table IV.8).

In 2014, the pharmaceutical industry directly contributed 0.4% of GDP in Latin America and the Caribbean (albeit with big differences between countries), while its contribution to employment was 0.2%, equivalent to just over 300,000 jobs (ECLAC, 2021a). Demand for innovative drugs in the region is met mainly by imports sourced from transnational companies outside the region. Generic drugs, by contrast, are mostly produced by firms operating locally, albeit with an increasing use of imported active ingredients.

Table IV.8

Latin America (selected countries), United States and European Union: stylized facts of the pharmaceutical industry, 2019
(Thousands of dollars and percentages)

	Labour productivity per worker, per year (Thousands of dollars)			Annual wages per worker (Thousands of dollars)		
	Brazil	Colombia	Mexico	Brazil	Colombia	Mexico
Manufacturing industry	32	41	43	Manufacturing industry	10	9
Pharmaceutical industry	75	53	78	Pharmaceutical industry	22	14
	Exports (Percentage of total)			R&D spending relative to sales (Percentages)		
	Brazil	Colombia	Mexico	Brazil	Colombia	Mexico
Manufacturing industry	33	13	40			
Pharmaceutical industry	7	12	13	Pharmaceutical industry	2.6	22
	Women employees (Percentage of total employees)			Unskilled workers (Percentage of total employees)		
	Brazil	Colombia	Mexico	Brazil	Colombia	
Manufacturing industry	27	35	37	Manufacturing industry	74	58.3
Pharmaceutical industry	50	54	54	Pharmaceutical industry	49	41.2

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of industry and innovation surveys.

As analysed in ECLAC (2021a), although the region accounted for just 3.5% of global pharmaceutical sales in 2020,³³ the major transnationals in the biopharmaceutical industry with a focus on R&D have a strong presence there. In countries with local production capacity, foreign transnationals generally account for roughly 40% of the value of domestic market sales, while domestic firms generate the remaining 60%. While transnational firms account for a larger share of the sales of patented medicines, domestic laboratories dominate the generics market. In Brazil, for example, foreign transnationals accounted for 77% of retail sales of patented medicines in 2019, but just 24% of generics and 20% of biosimilars (INTERFARMA, 2020).

The global pharmaceutical industry is intensive in scientific research and experimental development. Since 2017, R&D spending has represented on average 18% of the total sales of the top 20 pharmaceutical companies, and 24% of their sales of medicines and vaccines (ECLAC, 2021e). The creation of new medicines is associated with high costs and long lead times. According to Schlander and others (2021), the average R&D cost associated with a new drug launch ranges from US\$ 161 million to US\$ 4.540 billion.

Unlike the world's leading companies in the field, pharmaceutical companies in the region are generally not R&D-intensive. Most of the drugs produced locally are based on generic active ingredients that are largely imported, which means that innovative activities are often limited to developing medicines, conducting medical research and carrying out small-scale clinical trials to obtain authorization for these drugs on the local market (ECLAC, 2020a). Meanwhile, basic research tends to be carried out in universities and public research centres and to be financed by the State, with little or minimal linkage with companies. In global terms, considering not only the pharmaceutical industry, it is estimated that countries of the Organisation for Economic Co-operation and Development (OECD) spend between 0.35% and 0.5% of GDP on medical science research, compared to the much lower figures of 0.065%, 0.063% and 0.042%, respectively, in Argentina, Uruguay and Chile (ECLAC, 2022c).

Intellectual property rights play a central role in protecting and monetizing the investments made in the development of new pharmaceutical products. However, patenting activity in health industries in Latin America and the Caribbean is focused primarily on inventions filed by international enterprises, with a very low rate of introducing local innovations. This pattern is consistent with the region's tiny share of pharmaceutical patents granted worldwide, which is still less than 1% even though it has quadrupled since 1990 (see figure IV.15). This low level of patenting is a direct result of the disconnect between the region's research centres and companies

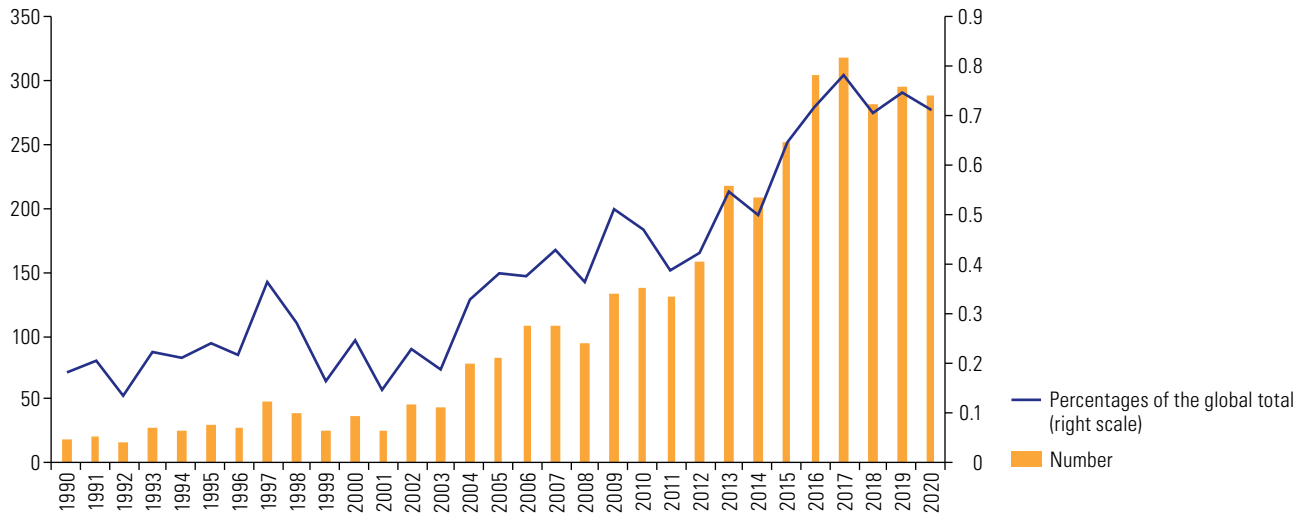
³³ Data at factory prices of EFPIA (2021).

in the sector.³⁴ On the one hand, this is because there has historically been a lack of incentives encouraging universities and technological institutes to patent. On the other hand, it also relates to the positioning of the pharmaceutical companies manufacturing in the region as they increasingly specialize in generic products whose patents have expired.

Figure IV.15

Latin America and the Caribbean: pharmaceutical patents granted, 1990–2020

(Number and percentages of the global total)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Intellectual Property Organization (WIPO), WIPO IP Statistics Data Center [online database] <https://www3.wipo.int/ipstats/keyindex.htm?lang=en&tab=null>.

The pharmaceutical industry, like the medical device industry, is one of the most heavily regulated in the world, as the health and, sometimes, the lives of the individuals who consume its products are at stake. National regulatory bodies are responsible for ensuring that medicines and medical devices produced or commercialized in a country meet the minimum requirements for safety, quality and efficacy, and therefore determine whether a new drug or medical device can be prescribed by the medical community and, ultimately, used by patients. Regulation thus has a direct impact on the economic activity and the innovation and investment processes of pharmaceutical firms, research centres and other industry actors. Moreover, the degree of regulatory harmonization and convergence between countries, or the mutual recognition of regulatory decisions, can have a direct impact on international trade and the possibility of establishing regional production and distribution chains (ECLAC 2021a and 2022c).

The capacities of the region's health regulators vary. The Pan American Health Organization (PAHO) has identified four situations: entities in 6 countries meet the requirements to be considered national regulatory authorities of regional reference; 13 countries have the necessary legal foundations and organizational structures to operate a comprehensive regulatory system, 7 countries have some of these foundations and structures, and 7 others lack them (PAHO, 2020). There is generally a positive correlation between the size of countries and their regulatory capacity. Despite some progress, driven, among other factors, by the Pan American Network for Drug Regulatory Harmonization (PANDRH) of PAHO, greater regulatory convergence would seem to be an unavoidable requirement to strengthen productive and commercial integration in the region's health industries.

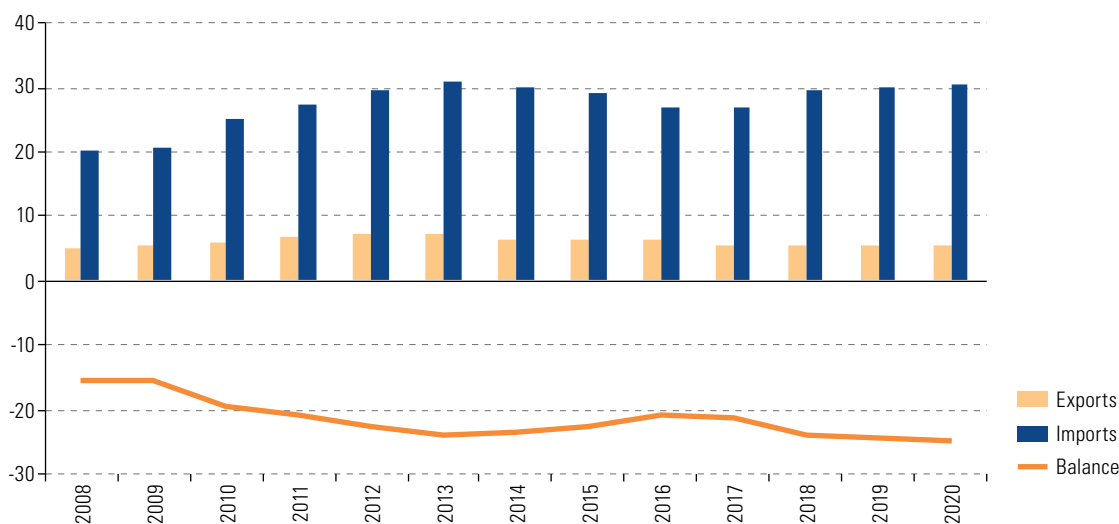
³⁴ Some countries have research hubs that are not exclusively university-based. This category includes well-established public laboratories with production capacities, such as the Instituto Butantan and the Oswaldo Cruz Foundation (Fiocruz) in Brazil, the Leloir Institute Foundation and the Dr. Carlos G. Malbrán National Laboratory and Health Institute Administration in Argentina and the Institut Pasteur in Uruguay, or private foundations such as the Fundación Ciencia & Vida in Chile. Through baseline public funding, these entities have been able to develop research projects with implementation plans and resources that have brought them close to the production stages (ECLAC, 2022c).

Latin America and the Caribbean accounted for an average of 0.9% of global exports of pharmaceutical products between 2018 and 2020, well below its share of global exports of all goods (5.5%) over the same period. The region's pharmaceutical exports have been on a downward trend since the beginning of the past decade, with their value declining from a peak of almost US\$ 7.400 billion in 2012 to US\$ 5.700 billion in 2020 (-23%). The region runs a persistent deficit in its trade in pharmaceutical products, and the value of its imports in 2018–2020 was almost five times that of its exports (see figure IV.16). The heavy reliance on extraregional supply for medicines with valid patents and active ingredients explains the region's persistent trade deficit. In particular, the current pandemic has highlighted the region's heavy dependence on COVID-19 vaccine supplies from external sources. In fact, this dependence is evident for all human vaccines: the amount of regional imports in the period 2018–2020 is 80 times that of exports (see table IV.9).

Figure IV.16

Latin America and the Caribbean: trade balance in pharmaceutical products, 2008–2020

(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, United Nations International Trade Statistics Database (UN Comtrade) [online] <https://comtrade.un.org/>.

Note: Excludes Panama, since its pharmaceutical exports correspond almost entirely to re-exports of medicines originating elsewhere.

Table IV.9

Latin America and the Caribbean: trade balance in human vaccines, 2008–2020

(Millions of dollars)

	2008–2010	2013–2015	2018–2020
Exports	75	35	20
Imports	1 482	1 596	1 573
Balance	-1 407	-1 561	-1 554
Imports/exports	19.7	46.0	79.9

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, United Nations International Trade Statistics Database (UN Comtrade) [online] <https://comtrade.un.org/>.

Note: Excludes Panama, since its pharmaceutical exports correspond almost entirely to re-exports of medicines originating elsewhere.

Brazil, Mexico and Argentina are, in that order, the top three exporters of pharmaceuticals in Latin America and the Caribbean, together accounting for 61% of the total value of regional shipments in the 2018–2020 period. These countries are not only the largest economies in the region, but also the biggest producers in the pharmaceutical industry, with important nationally-owned technology centres and laboratories. Among the

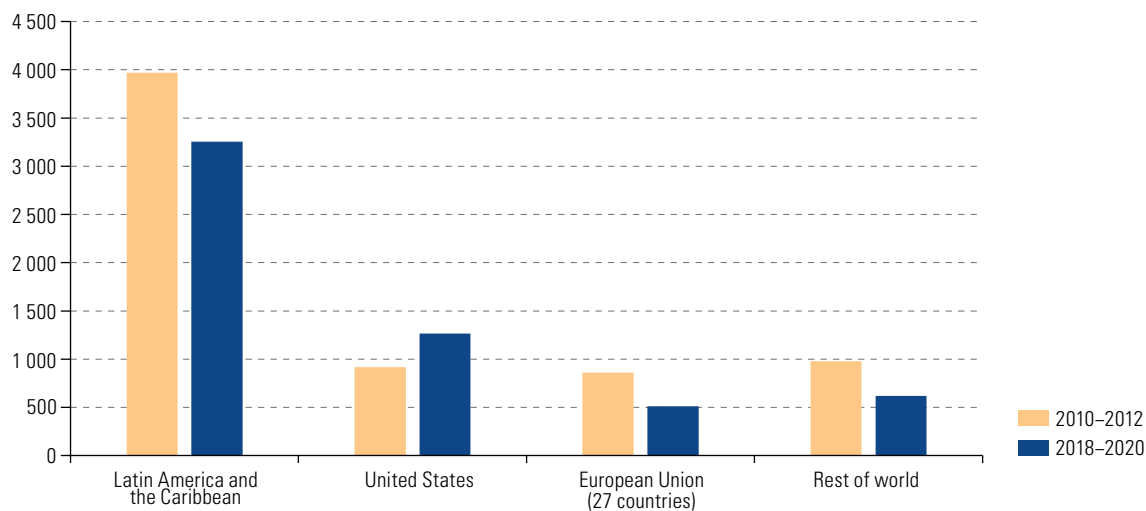
smaller economies, the Dominican Republic and Costa Rica are the fourth- and sixth-largest exporters of pharmaceutical products, respectively. In both countries, these shipments mainly derive from multinational companies under the free trade zone regime.

The main destinations for pharmaceutical exports from Latin America and the Caribbean are the region itself and the United States, which absorbed, on average, 58% and 22% of the total value of shipments in 2018–2020, respectively. Shipments to both markets have performed unevenly over the past decade. Whereas exports to the region from 2018–2020 were down by 18% compared with the average for 2010–2012, exports to the United States were up by 38% (see figure IV.17). This is mainly because the United States share of Mexican pharmaceutical exports nearly doubled, from 23% between 2010 and 2012 to 45% between 2018 and 2020.

Figure IV.17

Latin America and the Caribbean: distribution of pharmaceutical exports, by main destinations, 2010–2012 and 2018–2020

(Millions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, United Nations International Trade Statistics Database (UN Comtrade) [online] <https://comtrade.un.org/>.

Note: Excludes Panama, since its pharmaceutical exports correspond almost entirely to re-exports of medicines originating elsewhere.

Despite the drop in intraregional trade in pharmaceutical products in the last decade, the regional market remains the largest for most countries in the region. With the exception of Brazil, the Dominican Republic and Mexico, the weight of the regional market in the pharmaceutical exports of the main exporting countries is over 70%, and in some cases even exceeds 90%. The main importers of pharmaceutical products from the region include several relatively small economies, such as Costa Rica, Ecuador, Guatemala and Honduras. Indeed, while in Argentina, Brazil and Mexico the weight of intraregional imports in total pharmaceutical imports is less than 10%, in several smaller economies—especially in Central America—the corresponding figure exceeds 40% and in some cases is as high as 60%.

In short, the smaller economies with less pharmaceutical production capacity depend the most on supplies from the rest of the region (ECLAC, 2021e). This situation suggests that, in a context of greater regional integration, the region's pharmaceutical industries could increase their production and expand their supply to meet demand from national health systems, especially for the products in greatest demand (analgesics, anti-inflammatories, antibiotics, antivirals, antimalarials, antihypertensives and antihistamines, among others).

3. Development and progress of the plan for self-sufficiency in health matters

On 18 September 2021, at the sixth Summit of Heads of State and Government of CELAC, ECLAC presented the document *Plan for self-sufficiency in health matters in Latin America and the Caribbean: lines of action and proposals* (ECLAC, 2021a), which was unanimously approved. The plan defines an agenda and a multilateral approach to enhance regional productive capacities; maintains a vision for the integration of health and productive development; strengthens existing institutional partnerships and mechanisms; identifies and prioritizes high-impact projects that are feasible to implement in the short term and promotes universal access to vaccines as a regional public good.

(a) Objectives and lines of action

The strengthening of the pharmaceutical industry, especially vaccines, implies a systemic approach to health that considers it both a right of the population and a strategic space for the development of the productive and technological base. Within that framework, the State plays a fundamental role in terms of regulation, capacity-building and ensuring universal access.

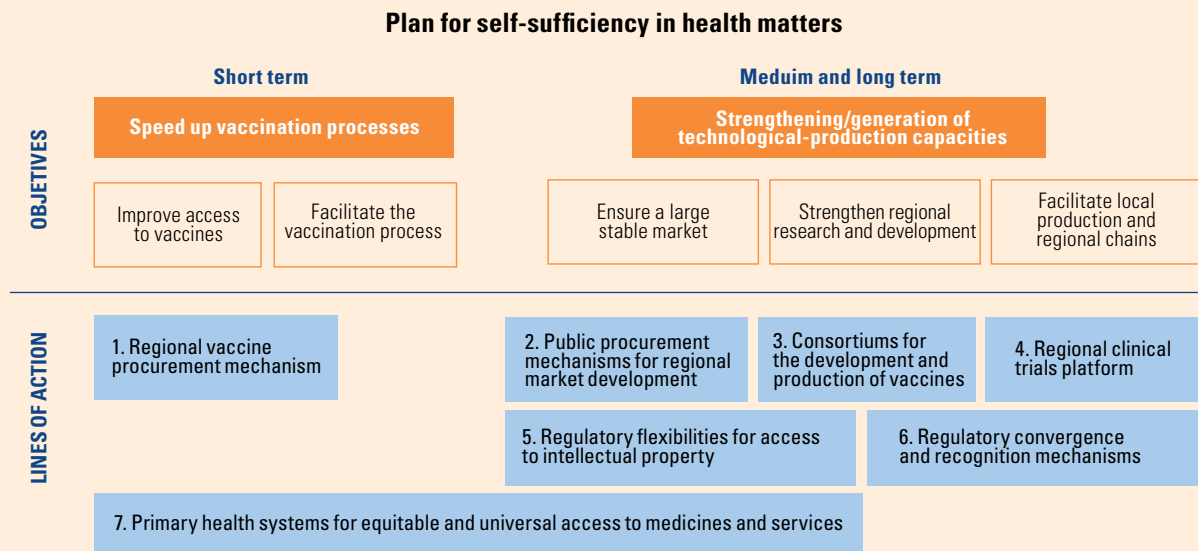
In the medium and long term, the plan seeks to strengthen regional research, development and production capacities for vaccines and drugs. To this end, three specific objectives were defined: (i) provide a stable, large-scale market that gives clear signals and certainty for firms to invest in; (ii) encourage and facilitate research and development in innovative projects and (iii) support local production and integration into regional production chains. Moreover, given the persistence of the pandemic, the plan included the objective of accelerating vaccination processes, for which two specific short-term goals were defined: (i) improve international access to vaccines and (ii) facilitate domestic vaccination processes. To achieve all these objectives, seven interacting lines of action were proposed (see box IV.4).

Box IV.4

Lines of action of the plan for self-sufficiency in health matters in Latin America and the Caribbean

1. **Strengthen mechanisms for pooled international procurement of vaccines and essential medicines.** The aim is to improve the negotiating position of the countries of the Community of Latin American and Caribbean States (CELAC) vis-à-vis international laboratories and other suppliers of vaccines and essential medicines to combat COVID-19 by strengthening pooled international procurement mechanisms.^a
2. **Use public procurement mechanisms for medicines to develop regional markets.** The aim is to improve, level up and coordinate national public procurement systems to facilitate the creation of a large and stable regional market for medicines, in which the region's producers can achieve competitive scale. This would allow the leveraging of the purchasing power of the public sector as an industrial policy instrument that could also be used to: (i) facilitate intraregional trade, (ii) foster the development of regional suppliers and (iii) improve bloc negotiation to gain access to inputs and technology transfer.
3. **Create consortiums for the development and production of vaccines.** Vaccine development is a lengthy, risky and expensive endeavour. Consequently, this line of action seeks to strengthen manufacturing capacities in the region through regional consortiums that facilitate the mobilization and deployment of economic and human resources for vaccine production and foster cooperation between vaccine developers and manufacturers, governments, multilateral organizations and financial institutions. Specifically, the creation of regional consortiums would aim to: (i) diversify or consolidate existing technology platforms for vaccine production, (ii) coordinate regional technology transfer processes, (iii) support partners' efforts in vaccine discovery, production and distribution and (iv) increase regional participation in R&D.

Objectives and lines of action of the plan for self-sufficiency in health matters in Latin America and the Caribbean



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Plan for self-sufficiency in health matters in Latin America and the Caribbean: lines of action and proposals* (LC/TS.2021/115), Santiago, 2021.

4. **Implement a regional clinical trials platform.** The objective is to create a regional COVID-19 vaccine clinical trials network, to generate efficiencies, scale and consistency in vaccine evaluation, thereby nurturing the region's scientific capacity. A clinical trials platform would improve coordination among regional research groups working on COVID-19 vaccines and treatments, and it would enable the region to participate as a co-developer of new products by drawing on its clinical research strengths.
5. **Take advantage of regulatory flexibilities to gain access to intellectual property.** The use of the regulatory flexibilities provided by the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), including the exemption from pharmaceutical patent protection for COVID-19 vaccines approved in June 2022 within the framework of the World Trade Organization (WTO), is an opportunity to generate greater access to medicines and vaccines in the region.
6. **Strengthen regulatory convergence and recognition mechanisms.** The objective is to foster regulatory convergence and recognition of health registrations among regulatory entities in matters of health emergency. The specific aim is to optimize the authorization or registration of medicines, in order to have a network of countries in which, ideally, a medicine is registered in one and, through an expeditious procedure, that registration is recognized in the other countries of the network. This line of action is supported by the work done within the framework of the Pan American Health Organization (PAHO).
7. **Strengthen primary health systems for equitable distribution of vaccines and universal access to them.** The objective of this line of action is to strengthen primary health-care systems in a comprehensive manner, focusing on: (i) national vaccination plans and the logistics to implement them, (ii) vaccine management and distribution, (iii) follow-up and monitoring of both vaccination plans and safety and effectiveness, (iv) registries and information systems, to manage mobility and traceability of people and (v) the evaluation and improvement of communication and information programmes for citizens, and other health programmes and sectors linked to immunization at the local level.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Plan for self-sufficiency in health matters in Latin America and the Caribbean: lines of action and proposals* (LC/TS.2021/115), Santiago, 2021.

^a The region has considerable experience in this area. The PAHO Revolving Fund for Access to Vaccines, which comprises 41 countries and territories of Latin America and the Caribbean, has been operating since 1977. This pooled procurement mechanism seeks access to quality vaccines and related products (e.g. syringes and cold chain equipment) at affordable prices. The Revolving Fund also operates as a partner of the COVID-19 Vaccine Global Access (COVAX) Facility in the procurement and delivery of COVID-19 vaccines in the region. The countries can choose to access COVID-19 vaccines using the fund as a procurement agent.

(b) From design to implementation

Following the approval of the plan for self-sufficiency in health matters, CELAC requested ECLAC to continue supporting this initiative, this time with regard to its implementation. On 22 October 2021, the first coordination meeting regarding the plan was held, during which the short-term road map for implementing its guidelines and proposals was presented. Three lines of action were prioritized, focusing immediate attention on: (i) coordination among national regulatory agencies, (ii) establishment of a regional clinical trials platform and (iii) coordination of regional purchasing mechanisms to improve access to vaccines and to build a regional market with an attractive and sustainable volume.

On 15 December 2021, CELAC, in collaboration with ECLAC, organized the second coordination meeting regarding the plan for self-sufficiency in health matters, with national drug regulatory authorities. It was attended by more than 100 representatives from 18 countries and regional groupings. The themes that emerged which may be structured into flagship projects include: creating a mechanism to define minimum standards for the temporary authorization of vaccines in the form of a regional mutual recognition agreement, ensuring mutual recognition of plant certification, adopting a regulatory convergence document, developing a joint strategy with PAHO to strengthen its instruments and drawing on the best practices of extraregional drug agencies.

In January 2022, Argentina became pro tempore Chair of CELAC. In addition to maintaining the focus of the plan's implementation in the short term on mechanisms for the pooled international procurement of vaccines and essential medicines and on regulatory convergence and recognition, it also defined as a line of action the regional development and production of vaccines with a focus on public laboratories.

The third coordination meeting of the plan for self-sufficiency in health matters was held on 17 May 2022. At the meeting, participants discussed an action plan for capacity-building and the creation of a permanent coordination mechanism to consolidate the joint procurement of essential vaccines and medicines. Previous experiences in the region in this area would be used as a reference, such as the negotiation of antiretroviral drug prices in Lima in June 2003, within the framework of the technical and ministerial meeting on the joint negotiation process for access to antiretroviral drugs and reagents in the Andean subregion, the Joint United Nations Programme on HIV/AIDS (UNAIDS), the participation of civil society organizations and laboratories producing antiretroviral drugs, and other initiatives developed by the Southern Common Market (MERCOSUR). At the fourth coordination meeting regarding the plan held on 5 July 2022, participants began work relating to the regional development and production of vaccines and medicines.

(c) Lessons learned and proposals for continuity

Progress towards achieving this goal of self-sufficiency in health matters will require major efforts at the national and regional levels. This relates to the already mentioned features of the pharmaceutical industry: (i) the central role of science, technology and innovation and the differences in available capacities in this area between countries in the region and advanced countries; (ii) the cumulative nature of developing scientific, technological and productive knowledge, which requires consistent and long-term policy initiatives; (iii) the variety of public and private actors and knowledge institutions with different objectives that interact with each other, which entails a continuous alignment effort and (iv) the existence of significant economies of scale in production, which emphasizes the importance of broadening access to regional markets in order to compete with large global producers. In this context, the design and implementation of the plan for self-sufficiency in health matters to date has given rise to the following recommendations:

- Reinforce the idea that industrial policy is at the core of the plan. Although ministries of health play a crucial role in implementation, the participation of other ministries, such as those of science and technology, industry and commerce, is also fundamental. The plan seeks to reconcile the objectives of health policies (access to medicines) with those of innovation policies (creation of new products, processes and capacities) and those of industrial development (generation of economic-productive activity).

- Also, strengthen the idea that this is a plan focused on a group of actions at the regional level. Interventions at the national level are not the priority. However, given regional heterogeneity, it would make sense for a new phase of the plan to also consider cooperation at the national level for some countries, such as institutional capacity-building.
- Although high-level political support is indispensable to the plan, the strategies, objectives and lines of action must function at an operational level. To this end, the technical agencies responsible for the policy areas related to the plan should be directly involved.
- Although short-term priorities have been defined, linked to the current pandemic situation, this is, in essence, a medium- and long-term plan. Therefore, it is advisable to design mechanisms that allow for continuity in the execution and monitoring of the plan's actions, especially considering that the pro tempore chairship of CELAC usually lasts only one year.
- Ensure more active involvement of productive actors from the private sector. This is a plan aimed at both improving the operating space of these companies and strengthening their productive and innovation capacities, which is why their participation in the various organized working groups is essential.
- Countries' interest in and commitment to the plan will depend on whether they see clear benefits of their participation. In this regard, it is worth evaluating the advantage of comparable progress in subregional coordination bodies such as MERCOSUR, the Caribbean Community (CARICOM), the Central American Integration System (SICA) and the Pacific Alliance, which may make it less complex to generate results in relatively short periods of time. The development of possible subregional initiatives must always be coordinated with the work carried out within the framework of the plan, in order to generate synergies at both levels.
- Finally, in order to avoid duplication and to foster synergies, it is necessary to coordinate the actions adopted within the framework of the plan with complementary initiatives carried out by international institutions, particularly the following:
 - In August 2021, PAHO announced the establishment of a collaborative platform to boost regional production of COVID-19 vaccines (PAHO, 2021).
 - The Secretariat of Foreign Affairs of Mexico, with the support of the Coalition for Epidemic Preparedness Innovations (CEPI), PAHO and ECLAC, developed a proposed road map for the regional manufacture of vaccines along with representatives from the private sector, academia and governments of the countries of the region.
 - On 22 June 2022, a new partnership was announced between the European Union and Latin America and the Caribbean on the local manufacture of vaccines, medicines and other health technologies and the strengthening of the resilience of health systems. This initiative is expected to increase Latin America's manufacturing capacity; foster equitable access to quality, effective, safe and affordable health products; strengthen health resilience in the region to address endemic and emerging diseases; and improve capacities to address non-communicable diseases (European Commission, 2022).

F. Digital transformation

Digitalization gives rise to new forms of value creation with the potential to increase well-being, competitiveness and environmental sustainability (see chapter I). This value creation is based on information and knowledge generated from digital data extracted from production and consumption processes through intelligent systems based on advanced digital technologies, such as the fifth-generation (5G) mobile network, the Internet of Things (IoT), edge computing, big data and artificial intelligence (AI).

The well-being of the population is linked to aspects relating to quality of life, in addition to income levels and working conditions. Digitalization can improve these aspects, for example by creating work opportunities through entrepreneurship or professional development linked to digital capabilities, or providing options that facilitate work-life balance, such as teleworking solutions. Similarly, in the health, education and government sectors, the use of digital solutions can improve service provision and coverage. Telemedicine, online medical appointment scheduling, preventive health-care applications, tele-education, online professional training, digital procedures for government services and citizen participation through digital channels are some applications that improve the quality of life. There are also digital applications for smart cities, which harbour the potential to improve public safety and transport services, ensuring they are more efficient, effective and sustainable. The opportunities for social interaction, entertainment and access to information provided by social networks, messaging services, websites and audio and video streaming platforms also enhance well-being.

Digital technologies are ubiquitous in productive sectors and, as a result, business and production models are being transformed into digital economy and Industry 4.0 models, which are based on data and knowledge to increase sustainable productivity and foster product and process innovation. In these new models, services will account for an increasing proportion of the value added in value chains.

Thus, competitiveness will depend on the digital capabilities of traditional firms in terms of incorporating software into the core of the business, building new digital platforms within the boundaries of traditional corporations, or converting production chains into digitally enabled ecosystems with interconnected services that meet a variety of users' cross-sectoral needs in one integrated experience (Blackburn and others, 2021). The latter may lead to the creation of smart microindustries based on local SMEs.

The region's development strategy should aim to promote the digital economy through the emergence of new sectors linked to technological ventures and to accelerate the digitalization of the productive sectors in which it is competitive (e.g. agriculture and food, mining and oil), in order to make processes more efficient and sustainable. In this sense, competitive advantages will depend increasingly on countries' ability to develop the technologies of this new paradigm and to adopt them in their economic apparatus in the three dimensions that determine digital development: the connected economy, the digital economy and the digitized economy. This section includes an analysis of the region's digital transformation with a focus on its productive potential.

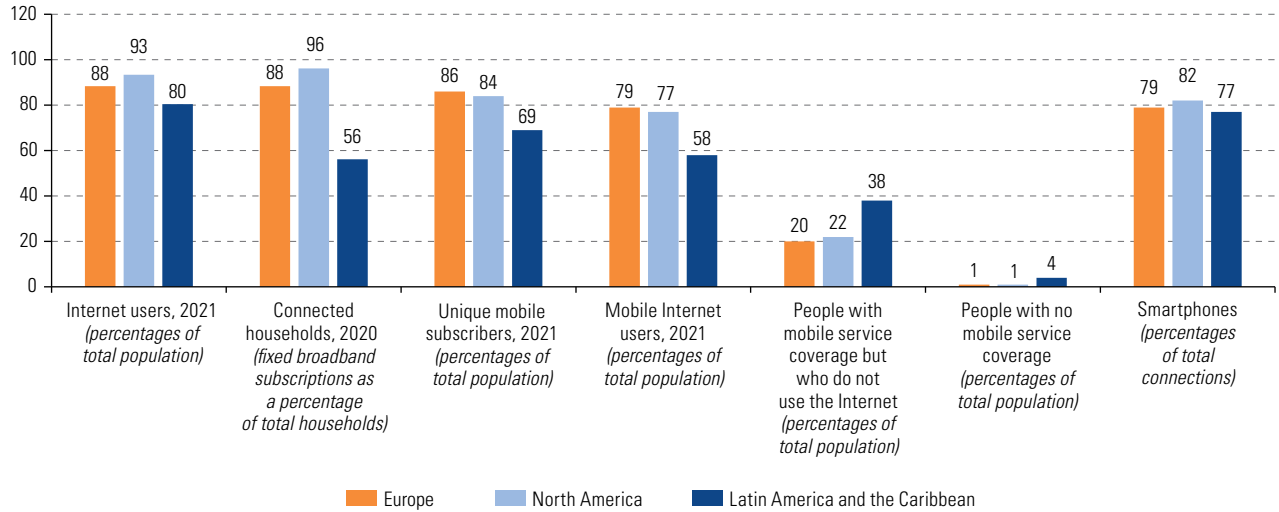
1. Connected economy: universalizing access and deploying new networks

In 2021, 80% of the population of Latin America and the Caribbean used the Internet, a penetration rate close to that recorded in more developed regions of the world, such as Europe (88%) and North America (93%) (Miniwatts, 2022) (see figure IV.18). Despite this, efforts in connectivity are still required. Roughly 56% of households in the region have fixed broadband connections, well below the North American and European penetration rates of 96% and 88%, respectively. Mobile networks are essential for the widespread growth of connectivity in the countries of the region, since they provide service coverage to 96% of the population. However, only 58% of the population use mobile Internet and 38% are only potential users (Okeleke and Suardi, 2022).

Connectivity across the different countries of the region remains very uneven. The levels of fixed broadband penetration in households illustrate significant difference between countries: in some countries, over 70% of households are connected, while in others the rate falls short of 25%. The gap within countries, between urban and rural households and between higher and lower income households, may be as much as 50 percentage points, but varies considerably between countries, in some cases reflecting differences of less than 10 percentage points. In all the countries analysed, mobile access enables greater service penetration, which exceeds 50% in most cases (see figure IV.19). In the small island developing States of the Caribbean as well, the percentage of Internet users (see figure IV.20) and access speeds have increased, albeit with large differences between countries.

Figure IV.18

Connectivity in selected regions of the world, around 2021
(Percentages)



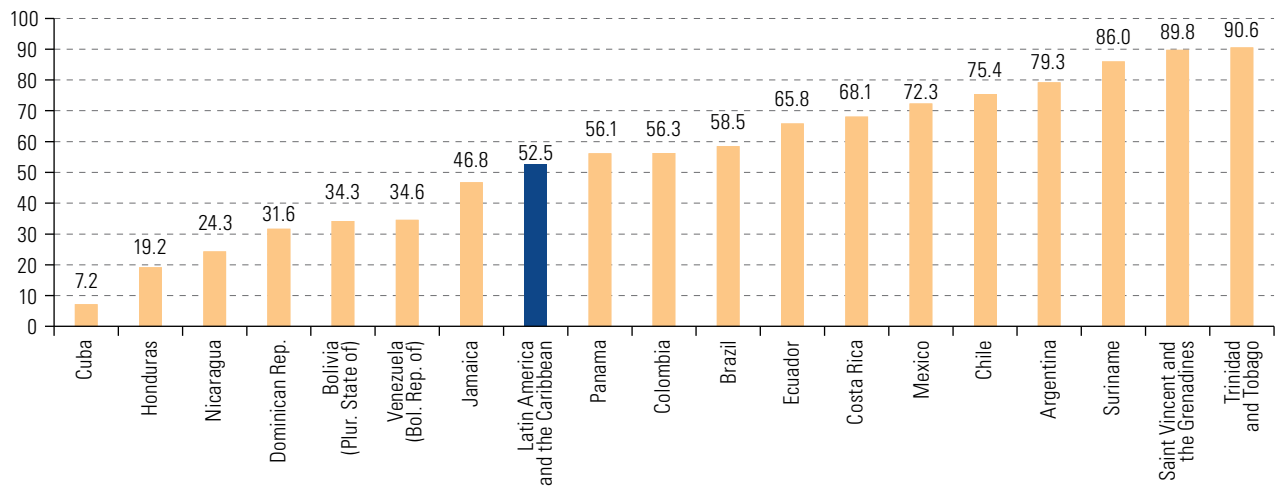
Source: Economic Commission for Latin America and the Caribbean (ECLAC), Regional Observatory for Digital Development, on the basis of data from GSMA Intelligence, 2022 [online] <https://data.gsmainelligence.com/>, International Telecommunication Union (ITU), World Telecommunication/ICT Indicators Database, July 2021, and Miniwatts, Internet World Stats [online] www.internetworldstats.com.

Note: A unique mobile subscriber is an individual who may have several mobile connections (i.e. several SIM cards).

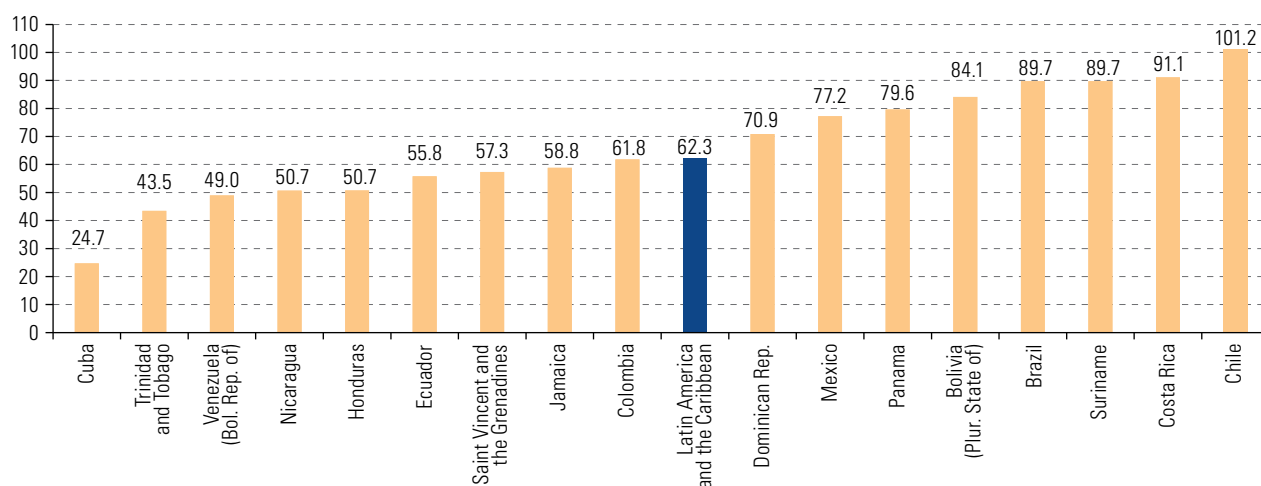
Figure IV.19

Latin America and the Caribbean (18 countries): Internet penetration in households and in the total population, 2020
(Percentages)

A. Percentage of households with a fixed broadband connection



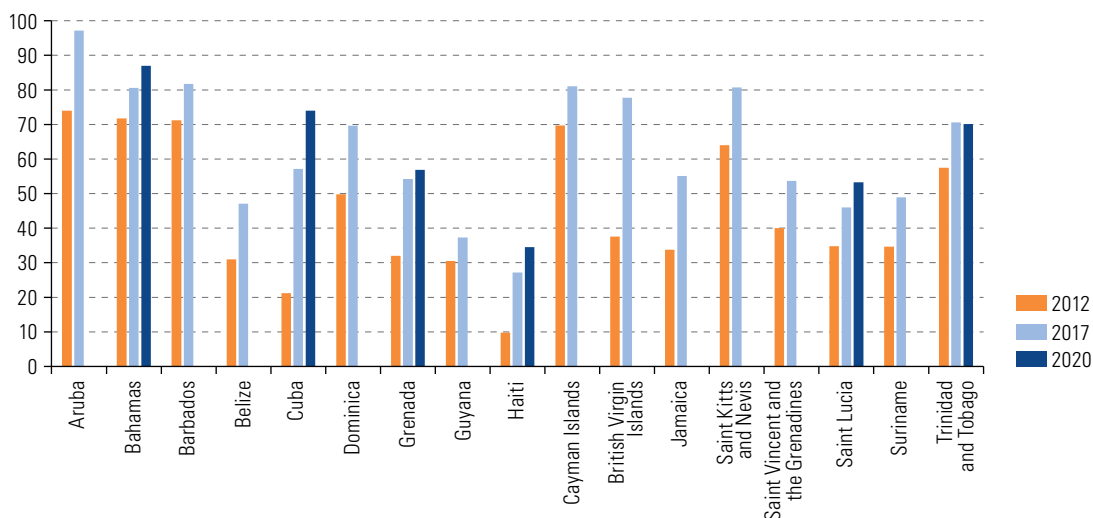
B. Percentage of population with a mobile broadband subscription



Source: Economic Commission for Latin America and the Caribbean (ECLAC), Regional Observatory for Digital Development, on the basis of International Telecommunication Union (ITU), World Telecommunication/ICT Indicators Database, July 2021.

Figure IV.20

The Caribbean (17 countries and territories): Internet users as a percentage of the population, 2012, 2017 and 2020
(Percentages)



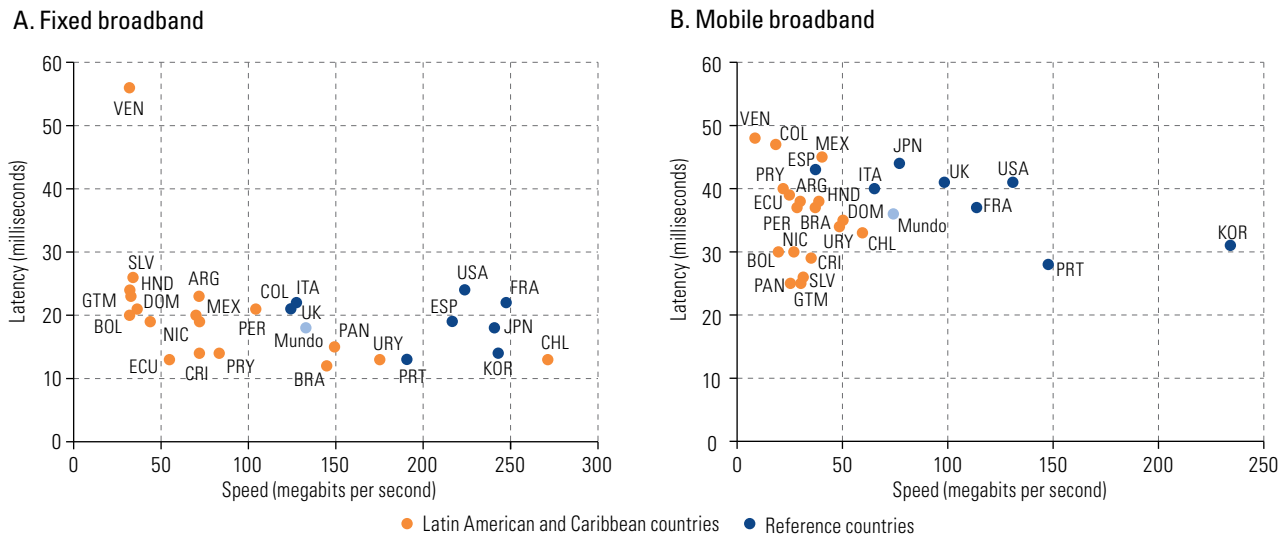
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from International Telecommunication Union (ITU).

Note: Source data include estimates.

The quality of the connection determines the services that can be used and the possibility of using more than one device simultaneously. In the region, access to fixed broadband varies greatly from country to country. Chile, Brazil, Panama and Uruguay stand out for their high average download speeds (over 130 megabits per second (Mbps)) and low latency, which are even comparable to those of more developed countries. Other countries, Costa Rica, Paraguay, Mexico, Argentina, Colombia and Ecuador, are in an intermediate situation, with speeds of more than 50 Mbps. Lastly, a group of countries lags behind, including the Plurinational State of Bolivia, the Bolivarian Republic of Venezuela, El Salvador, Guatemala, Nicaragua, the Dominican Republic and Honduras. Trends in mobile broadband are more similar, with most countries registering speeds of 50 Mbps or less and average latencies. However, they clearly lag behind more advanced countries such as the United States and the Republic of Korea (see figure IV.21).

Figure IV.21

Latin America and the Caribbean (18 countries): connection quality in terms of fixed and mobile broadband latency and download speed, monthly average, May 2022 (Milliseconds and megabits per second)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), Regional Observatory for Digital Development, on the basis of Speedtest Global Index, 2022 [online] <http://www.speedtest.net/global-index>.

Note: The speed corresponds to the average speed recorded each time a user performed a speed test in each country in a given month. Countries must have at least 300 unique user results to be able to calculate average mobile or fixed broadband speed.

Access to effective connectivity³⁵ is a determinant of well-being and equity. The gaps in the access to and quality of broadband services considerably limit the ability to take advantage of the benefits of teleworking, tele-education and remote health services, as well as entrepreneurship through digital channels and access to other types of goods and services offered by public platforms and institutions, and this in turn widens socioeconomic gaps. In the digital age, the connectivity gap between the highest and lowest income strata determine access to fundamental services and worsens socioeconomic inequalities. In the wake of the COVID-19 pandemic, that gap grew starker, as 35% of children between the ages of 5 and 12 in the region lived in households with no Internet connection (see figure IV.22).³⁶

In the region, measures are urgently needed to close the connectivity gap, especially in households. Meeting this goal would cost between US\$ 50 billion and US\$ 300 billion between now and 2030, according to studies by the Inter-American Development Bank (IDB) (Brichetti, 2021), the International Telecommunication Union (ITU, 2020) and the Latin American Telecommunications Research Centre (cet.la) (González and others, 2019). The magnitude and scope of this investment indicates the need to pursue an ambitious public-private agenda that includes governments, companies and development banks, as well as international cooperation mechanisms (in particular, the European Union's Global Gateway strategy).

Assuming that in the digital age there is no social well-being without digital well-being, ECLAC proposes the provision of a basic digital basket to guarantee effective connectivity for the most vulnerable segments of the population as the main tool of a demand-side subsidy policy. This basket would be composed of a fixed broadband or mobile broadband plan plus one or more access devices (smartphone, tablet or laptop),³⁷ and could include the development of basic digital skills through informative content in applications preloaded on the devices, for example. Estimates of the cost of the basic digital basket show how difficult it would be for households to access effective connectivity, as this cost can represent up to 33% of the average income of households in the poorest quintile (see figure IV.23). Given the large differences between the countries of the region considered, it may be necessary to use different financing tools and mechanisms.

³⁵ Effective connectivity means access to broadband connectivity at speeds that allow for intensive data use in simultaneous activities (e.g. online classes and teleworking), devices allowing suitable access for relevant uses and basic digital skills.

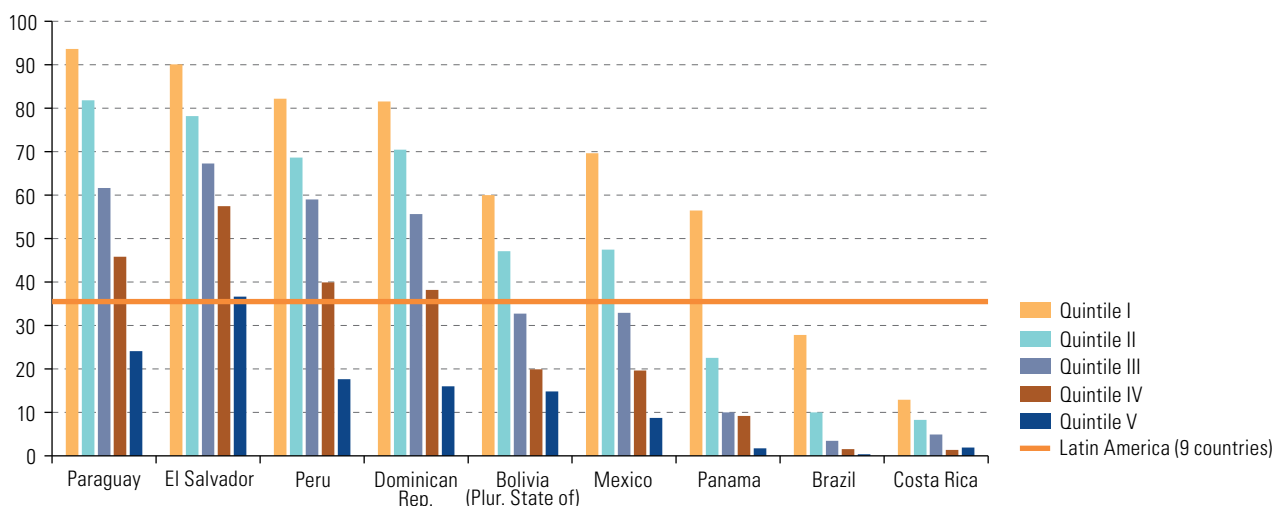
³⁶ The challenges and opportunities of digitalization in learning are analysed in section D of chapter V.

³⁷ In the context of the COVID-19 pandemic, it became evident that computers or tablets are needed for activities such as tele-education and teleworking since smartphones may not be adequate in that regard. It should also be considered that several members of a household may need to use digital services simultaneously, so more than one device is required.

Figure IV.22

Latin America (9 countries): children between the ages of 5 and 12 living in households with no Internet connection, by income quintile, 2020^a

(Percentage of the total number of children in each income quintile in each country)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), Regional Broadband Observatory (ORBA), on the basis of Household Survey Data Bank (BADEHOG).

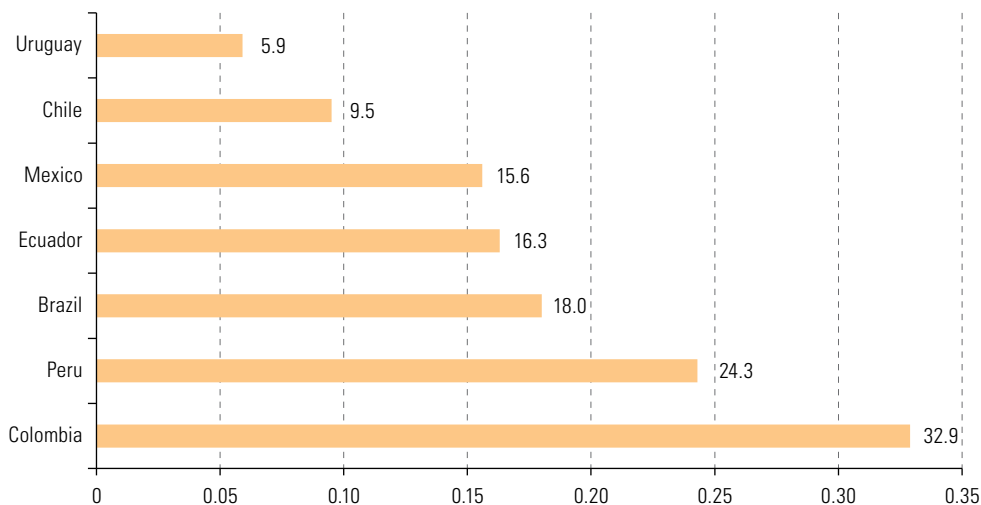
Note: Connected households have access to the Internet, which means Internet is generally always available for use by all members of the household. The connection and the devices used may not be owned by the family, but household assets must be considered. The Internet connection in the household must be working when the survey is conducted.

^a Data from Brazil and Panama refer to 2019. In Brazil, the survey changed in 2016, from the National Household Survey (PNAD) to the Continuous National Household Survey (PNADC), which includes access to the Internet. In Costa Rica and the Plurinational State of Bolivia, questions are asked about household Internet access.

Figure IV.23

Latin America (7 countries): effective affordability of a digital basket in households in the poorest income quintile

(Monthly cost as a percentage of average monthly household income)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), Regional Observatory for Digital Development.

Note: The basic digital basket is calculated from the cost of a laptop computer (RAM of 4–8 GB and storage of 128–256 GB), a tablet (RAM of 2–3 GB and storage of 32–64 GB) and a smartphone (connectivity above 4G, RAM of 4–6 GB and storage of 32–64 GB), in addition to the monthly cost of fixed and mobile broadband services. The cost of fixed broadband service corresponds to the entry-level prices of postpaid plans. The cost of mobile broadband service corresponds to 30-day prepaid data packages and 8 GB of data transfer or the closest possible. It does not include high-end computers (with a solid-state drive (SSD) or a graphics processing unit (GPU)).

Ensuring further transformation in the region requires the faster adoption of the new technologies of the digital revolution, such as 5G and the Internet of Things. The adoption of 5G and its applications will be key to industry competitiveness and the ability to offer the cutting-edge public services associated with the development of smart cities (ECLAC, 2022c). In 2021, 5G mobile connections accounted for 1% of the total in the region, 4% in Europe, 13% in the United States and Canada, and 29% in China, one of the global leaders in the adoption of this technology.

The adoption of the Internet of Things in Latin America and the Caribbean has also been slower than in other regions, which is linked to structural productive factors. In 2020, there were 13 billion recorded connections to the Internet of Things, 46% of which were in Asia and the Pacific, 23% in North America (United States and Canada), 19% in Europe and 5% in Latin America and the Caribbean (Okeleke and Suardi, 2021). In 2021, it is estimated that there were more than 200 million connections in the region, 30% of which came from the agriculture, mining, oil and gas, and construction sectors (Cabello, 2021).

2. Digital economy: an innovation boom in the region

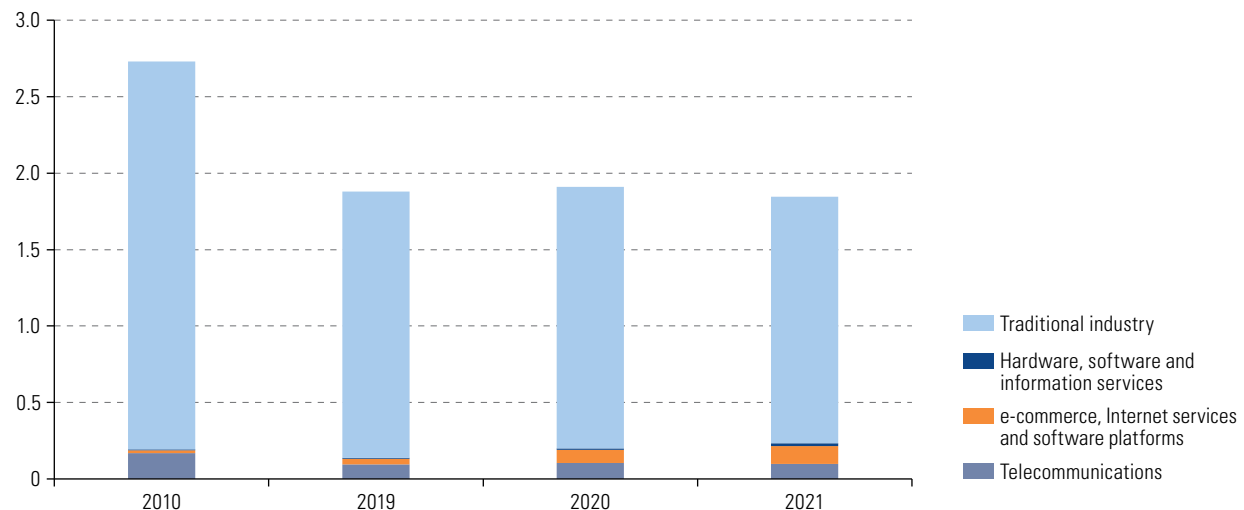
In line with the global trend, the weight of the digital economy in the regional economy as a whole has increased in recent years. In particular, the COVID-19 pandemic boosted the use of online channels in various socioeconomic activities. Comparing the first quarter of 2020 to the first quarter of 2021, traffic on e-commerce and fulfilment services websites and applications increased by more than 60%, while traffic relating to banking and business services grew by more than 50% in each case. In the Caribbean economies, the increase in the share of information and communications technology in foreign trade in services stemmed more from the sharp decline in other types of services than growth in the value of exports (UNCTAD, 2021).

Thus, in March 2021, the region's digital industry, in terms of the market value of its companies, was worth more than US\$ 184 billion dollars, equivalent to 13% of the total value of the 500 largest companies in the region. This implies growth of 21% between 2010 and 2021, which, although it seems a moderate increase, is significant in the context of a 36% drop in the value of traditional sectors over the same period. The greater weight of the digital economy is attributed to the strong expansion of e-commerce and Internet services platforms, which grew at rates of 282% and 184%, respectively, between 2019 and 2021 (see figure IV.24).

Figure IV.24

Latin America and the Caribbean: value of the digital industry compared with traditional industries, by industrial segment, 2010, 2019, 2020 and 2021^a

(Trillions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC)/European Union, Regional Observatory for Digital Development, on the basis of data from Bloomberg on the 500 companies with the highest market value in Latin America.

^a Data at 31 December 2010; 1 January 2019; 28 February 2020; and 23 December 2021.

Start-ups based on digital technologies are a key driver of digital development. Over the last 10 years, they have received a major boost in the region, to the extent that, for every 10 start-ups (86%), almost 9 are based on digital technologies or belong to the sector. South America accounts for most of this innovation, with 82% of the total number of start-ups. Brazil and Mexico stand out, accounting for 57% and 13% of the total number of digital start-ups in the region, respectively (ECLAC, 2022c). Digital start-ups are mainly concentrated in the information technology segment, with 24% of the total number of companies, followed by the software industry, with 20% of the total. Notable features include the rise of innovations related to artificial intelligence solutions, accounting for 7% of the region's total digital start-ups, and developments related to financial service, education and agriculture technologies (ECLAC, 2022c). Digital start-ups benefit from training, financing, mentorship and access to export networks, as well as the streamlining of procedures for the creation of companies and greater coherence between the regulatory frameworks of the countries of the region (OECD/ECLAC/CAF, 2016).

The economic crisis derived from the pandemic weighed on the emergence of new digital start-ups (which declined by 73% between 2019 and 2021) owing to the instability of demand and weaker funding of ventures in the form of seed capital. Despite this, by mid-2021, start-ups had attracted US\$ 7.2 billion in equity investment, more than tripling the values of previous periods (CBInsights, 2021). Although a significant proportion went to ventures in the early stages of development, the largest amounts corresponded to operations in more mature companies, which fostered the emergence of unicorn companies that allow the consolidation of the digital ecosystem. In May 2022, 35 unicorn companies were registered, of which 37% in fintech, 29% in e-commerce platforms and 11% in business solutions, followed by logistics and cryptocurrency companies (9% in each case), and finally foodtech and gaming (3% each).

Fintech and e-commerce platforms play a significant role in inclusion in the region. In 2021, 73% of adults had some type of financial account, representing the largest advance among developing world regions, thanks to the transformation in the way people make and receive payments, secure loans and save as a result of digitalization. Additionally, 40% of adults made digital payments to retailers (14% for the first time during the pandemic) and 24% received a government transfer into their account (Demirgüç-Kunt and others, 2022). Meanwhile, e-commerce platforms have enabled SMEs to access markets and are fostering their digitization. For example, the number of new active sellers on Mercado Libre rose from a monthly increase of 2% in the months prior to the pandemic to 24% following its onset in March 2020. At the end of 2021, around 500,000 SMEs were selling through this platform (Mercado Libre, 2021).

Regional e-commerce has seen strong momentum, registering domestic growth of 33% between 2019 and 2021 and 14% cross-border growth, totalling US\$ 230 billion in 2021. More than 90% of e-commerce occurs within countries, enabled by local retail platforms such as Mercado Libre and Lojas Americanas, in addition to international companies that also operate in the countries, such as Shopee and Dafiti. Cross-border trade is concentrated in giant international platforms such as Amazon and Alibaba. However, this gap is likely to narrow in the medium term, as these giants are attracting sellers to their platforms in the region's largest markets, and local platforms are including international product offerings.

Amid this backdrop, the ECLAC proposal to advance in building a regional digital market is a strategic opportunity to foster a harmonized economic space that facilitates the exchange of services and products digitally, increasing individuals' and companies' confidence in their participation in the digital economy. The regional digital market can promote trade between the countries of the region or within subregional trade blocs, and encourage investment and the development of services, applications and innovations. The main advantages are greater market scale, better coordination of resources and lower transaction costs (Calderón and others, 2021).

3. Digitalized economy: Industry 4.0 for the transformation of productive sectors

The digital transformation of productive sectors goes beyond the optimization of productive and management processes. It also gives rise to innovation in products and services (e.g. products conceived as services) and in business and production models, leading to the reconfiguration of value chains and the transformation of markets and traditional industries. The challenge for players in traditional industries is to incorporate digital technologies into their products, to develop digital services based on the use of data and to introduce intelligent systems into innovation, production, logistics and marketing processes. All this means exploiting developments that lie completely outside their core business but that have become pervasive in the economy, resulting in stronger momentum in corporate mergers and acquisitions (ECLAC, 2022b).

This trend is also evident in the region, where the number of mergers and acquisitions of companies in the digital sector by traditional companies picked up pace from 2011 and accelerated even further between 2017 and the crisis of 2020, which slowed momentum. Between 2010 and 2019, the number of such operations increased greatly, from 13 to 62. At the end of 2020, based on the number of transactions, 25% of cross-border mergers and acquisitions and greenfield foreign direct investment (FDI) projects targeted digital sectors, equivalent to 19% of total cross-border mergers and acquisitions and 14% of new greenfield FDI projects in value terms (ECLAC, 2021f).

The COVID-19 pandemic has been a catalyst for digitalization in productive sectors, driving business changes aimed at increasing online business activity, adopting new equipment and developing new products. These changes have been more easily made by companies with a higher degree of digitalization, which have been more resilient to the crisis in terms of impacts on sales, earnings and employment. Globally, in comparison with non-digitalized companies, the decline in sales recorded by digitalized companies was three times less, while the decrease in earnings was 65% less, and job losses were fewer, 29% vs. 36% for non-digitalized companies. This explains why one third of companies in the region (the same proportion as in Asia and Africa) have increased their online activity because of the pandemic and 95% of them expect to make this change permanent. Likewise, manufacturing companies have accelerated automation, although this trend is still emerging in the region, considering that only 15% of companies have begun this process, compared with 26% in Asia. In these regions, the average proportion of companies using 4.0 technologies in their production processes is still below 2% (UNIDO, 2021).

The degree of adoption of new technologies varies from one industry to another. In the region, the agricultural and automotive sectors are among the most active in incorporating digital technologies into their production chains. This has improved their productivity and sustainability, in addition to making a positive impact on their production ecosystems by boosting innovation (see table IV.10).

Table IV.10

Brazil and Mexico: examples of Industry 4.0 impacts in the agricultural and automotive sectors

Automotive industry in Mexico	Agriculture in Brazil
 <ul style="list-style-type: none"> • 25% increase in labour productivity. • Transformation of the supply chain with 200,000 suppliers. 	 <ul style="list-style-type: none"> • 30% increase in crop efficiency. • 50% reduction in environmental impacts (water, energy and fertilizers). • 20 agricultural technology (agtech) innovation centres, with a focus on post-farm stages, followed by precision farming.

Source: Economic Commission for Latin America and the Caribbean (ECLAC)/European Union, Regional Observatory for Digital Development.

The agricultural sector, which contributes 8% of the value added of the region's GDP, is incorporating digital technologies into its value chain to increase efficiency and maintain international competitiveness. In this sector, technologies have evolved from the use of simple weather forecasting and product price information solutions to more advanced uses such as digital agricultural trading platforms and smart farming. In 2018, there were more than 450 technology innovation start-ups in the agricultural sector, reflecting 425% growth in 10 years. Among these start-ups, 19% were dedicated to offering trading platforms, outsourced services, financing or food logistics and distribution technologies, while 60% focused on precision agriculture, management and information and education services for producers, or mechanization and automation of tasks (IDB, 2019).

The first group includes Frubana, PlazaApp and Waruwa in Colombia, Agree Market and Alimentos Cooperativos in Argentina, and Frexco in Brazil, which connect producers, transporters and a variety of potential customers—from end consumers to hotels or restaurants—and thereby reduce the number of intermediaries, lower transaction costs and ensure better prices for farmers and other producers. They also facilitate access to production inputs. Start-ups such as Agrofy and Agroads³⁸ (Argentina) increase product availability and price competition and transparency by connecting producers with a wide range of suppliers, while expanding the market for suppliers. These platforms operate locally in several countries in the region.

In Latin America, the precision agriculture market was worth US\$ 1.210 billion in 2021 and the value is expected to increase to around US\$ 2.13 billion by 2026, at a compound annual growth rate of 15.4% (Market Data Forecast, 2022). Brazil is the Latin American country with the largest number and widest range of start-ups dedicated to improving on-farm processes with Industry 4.0 technology. In 2021, there were 1,574 such start-ups, reflecting 40% growth in 2020 despite the pandemic (EMBRAPA, 2021). More than a third of these start-ups specialize in farm management solutions, data integration systems, marketing platforms, and logistics and traceability (Libero, 2021). The proliferation of these ventures in other countries in the region is significant. Argentina accounts for 23% of the total, followed by Chile, Colombia, Uruguay, Peru and Mexico (IDB, 2019; Carrión and Toro, 2021). Specifically in precision agriculture and on-farm processes, there are several important start-ups in these countries, such as EIWA in Argentina, Instacrops and Agroclick in Chile, Innterra and Agrodai in Colombia, Tierra de Monte in Mexico and Space Age in Peru, which are just some of the references that, in most cases, operate in more than one country in the region.

An additional impact of agricultural trading platforms and on-farm solutions platforms is that they generate information, either through marketing channels or through intelligent algorithms based on data from high-resolution satellite imagery, which facilitates access to credit by small producers to the extent that data analysis provides more efficient ways of assessing climate and its impact on crops, producers' financial capacities and credit risk. Another important aspect linked to the use of blockchain technologies and artificial intelligence is related to product traceability, food security and certification. Increasingly, full traceability, understood as the monitoring of food throughout the production and distribution process is a requirement for market access, as it allows certification of quality, origin, compliance with health standards and sustainability of agricultural products (Sotomayor, Ramírez and Martínez, 2021).

In the automotive industry, the use of automation and of digital technologies to monitor production processes are increasing labour efficiency and transforming the production chain. In Argentina, the 'vehicles per worker' and 'hours per vehicle' indicators improved from 18.8 and 73, respectively, between 2000 and 2009, to 20.4 and 55.9, respectively, between 2010 and 2018. In 2018, furthermore, the automotive sector accounted for 3.3% of private sector investment in R&D, which was geared towards the development of innovations aiming for product customization through the provision of associated services. At the same time, the adoption of technologies to boost Industry 4.0 has generated spillover effects for auto parts companies, which have had to adopt new technologies in order to be competitive in the supply chain. Thus, the ecosystem of more than 1,500 auto parts companies has been modernizing in parallel with vehicle manufacturing plants. Some 31% of companies in the automotive sector have implemented the use of digital technologies to improve interoperability with suppliers, while 24% have implemented these technologies to improve the efficiency of their production processes (Dragún, Ernst and García Díaz, 2020).

³⁸ Currently, up to 400,000 people visit the Agroads platform to find inputs. Multiple agricultural suppliers that are customers of the platform have reported positive impacts in terms of increases of up to 20% in sales (Agroads, 2019).

In Brazil, the automotive industry is leading the implementation of advanced technologies —such as robotics, 3D printing, artificial intelligence and the Internet of Things—, and this has created demand for qualified personnel. Jobs related to Industry 4.0 are expected to grow by 8.5% between 2019 and 2023, and specialized higher education programmes and research centres emphasizing Industry 4.0 have been created accordingly. At the same time, spillover effects in supply chains and logistics have resulted in the creation of a specialized sector of companies providing Industry 4.0 solutions in the automotive sector. According to a survey conducted in 2019, 26% of companies surveyed that were suppliers to the supply chain of this industry invest in adopting and implementing advanced technologies to improve production systems, offer new services and create new technological products. Lastly, the sustainability advances enabled by these technologies have reduced greenhouse gas emissions in the manufacturing process (by up to 32%) and as a result of the adoption of electric and hybrid vehicles in the Brazilian market (the number of electric vehicles sold in the country was estimated at 5,000 in 2020).

By transforming business and production models, the digitalization of the economy has significant effects on the world of work. The cross-cutting application of new technologies is expected to eliminate a considerable number of jobs, transform many more and create new ones. Estimates of the risk of job destruction owing to greater automation as a result of the incorporation of artificial intelligence and robotics solutions factor in the technological feasibility of replacing tasks related to different jobs. The likelihood of substitution increases along with the number of tasks that can be automated. According to Weller, Gontero and Campbell (2019), on average for 12 countries of the region, 24% of employed persons would be at risk of losing their jobs because of technological substitution and almost 16% of employed persons would face a high risk (70%–100%).³⁹

The destruction of jobs and the creation of labour opportunities may give rise to new inequalities and divisions in the labour market. Different groups of employed persons, based on gender and education level, would be affected in varying degrees by technological substitution. Several of these processes involve risks of greater polarization and segmentation of the labour market, which must be addressed with public policies.

In sum, there is no one optimal trajectory for planning the penetration of digital technologies in companies, as these trajectories are neither linear nor one-directional. In this context, support policies have to consider the conditions characterizing each productive territory, the particular features of the technologies to be disseminated and the specificities of the associated industries and companies in terms of production and management capacities and connection with their local setting (ECLAC, 2021f).

4. Lines of action for digital transformation and inclusion

The possibilities for charting new development paths for the countries of the region will depend on how society, the productive sectors and governments adopt digital technologies. To advance in this process, ECLAC (2022c) proposes a set of digital development policies framed in the following five lines of action.

(a) Building an inclusive digital society

- Ensure access to high-speed broadband for effective participation in the digital era. This requires new forms of funding. Options may be to consider reforming Universal Service and Access Funds (USAFs) and implementing a regulatory “sandbox” that enables operators to directly manage some of their contributions to USAFs to cover the costs of providing services to lower-income households.⁴⁰ This also involves allocating revenue to companies in the information and communications technologies sector, as well as attracting investment in order to expand fixed broadband coverage and improve mobile broadband connection speeds.

³⁹ This conclusion factors in an economy with a large low-productivity sector, which is far from the technological frontier and would not be subject to substitution, unlike medium- and high-productivity jobs. Jobs facing zero risk of substitution tend to be those involving low incomes and fewer labour and social rights. This sector accounts for 48.9% of jobs.

⁴⁰ Authorization for self-management of resources may be subject to the fulfilment of conditions set by regulators to promote competition between service providers, which would lead to improved conditions being offered so that this authorization can be obtained.

- Universalization of broadband connectivity through a basic digital package that enables lower-income sections of the population to enjoy effective connectivity and take advantage of the benefits of digital technologies. In this context, coordination between the public and private sectors is essential.
- Access to and creation of digital solutions relevant to the population. This involves measures for regulatory flexibility, for example, in terms of net neutrality, measures that encourage the use of online education, health and government services through a zero-tariff approach that allows users to access such services for free. In addition, the development of mobile applications to access these services should be considered.
- Development and implementation of policies and instruments that include socioeconomic, geographic, age-related and gender-related criteria.

(b) Fostering digital transformation in the production sector

- Strengthen the message that Industry 4.0 involves both opportunities and threats and that the differences between countries adopting or not adopting these technologies will increase if appropriate policy measures are not implemented. The Plan de Desarrollo Productivo Argentina 4.0, announced in April 2021, defines 56 public policy initiatives to adapt domestic industry to 4.0 technology and to promote the development of 4.0 technological solutions.⁴¹
- Support the incorporation of cutting-edge digital technologies into production processes (supply chains, processing, manufacturing and operations) and into distribution channels, facilitating the transition to a green economy. This includes from the implementation of actions to raise awareness of the potential of technological solutions for different sizes of companies and sectors to the creation of digital capabilities, especially in traditional activities. An efficient mechanism to achieve this is the promotion of demonstrations in science parks, incubators, accelerators and innovation laboratories. In particular, systems for testing industrial solutions must be designed to ensure their suitability for specific business needs.⁴²
- Develop and implement policies suited to the features of the productive areas, the characteristics of the technologies to be disseminated and the specificities of the related industries and enterprises, in terms of production capacities, management and linkages with the local area.
- Promote digital entrepreneurship through financing mechanisms that facilitate the creation of emerging and technology-based companies, including the microelectronics, software and applications sectors.
- Accelerate the deployment of fibre optic networks and 5G mobile networks that enable the use of industrial solutions in terms of latency and speed. This requires progress in the processes of spectrum allocation and tendering to provide commercial 5G services, as well as updating regulatory frameworks in the telecommunications sector.
- Promote the installation of advanced data centres close to users. The increased adoption of 5G and multi-cloud solutions will demand data centres with large storage and processing capacity that provide the high speeds needed to frequently download large content.
- Define and adopt Industry 4.0 standards to enable intelligent and autonomous data-driven equipment and technologies to function interoperably, transparently and securely. The definition of standards requires research and experimental verification, and participation in international technical discussion forums in order to promote their application later on.
- Promote vocational training and training systems in areas related to digital technologies, with the aim of encouraging the development of digital ecosystems and improving employability. Coordination with the private sector is key to match supply and demand in the labour market in sectors linked to Industry 4.0.

⁴¹ See [online] https://www.argentina.gob.ar/sites/default/files/pe_desarrollo_productivo.pdf.

⁴² The definition of a technological learning path will be possible through the dissemination of collective experiences in the adoption of relevant technologies by companies, whose characteristics, decision rules, capabilities and behaviours are fundamental in defining the direction and pace of technical progress (Cimoli and Dosi, 1995).

- Promote innovation in the public sector. Public administration systems must transform their service delivery processes. The potential of digital technologies to improve efficiency and effectiveness will be harnessed when all actors in the ecosystem adopt such solutions. Digital innovation in processes linking governments and companies is also essential to creating synergies that encourage the adoption of these technologies. In the same way, it is essential to foster digitalization in the provision of services in the public interest, such as education and health, in addition to digital applications for smart cities.

(c) Strengthening digital trust and security

- Formulate national cybersecurity strategies that help public and private actors to address cyberattacks in a coordinated manner.
- Strengthen institutions and regulatory frameworks in the context of data privacy and cybersecurity. There is an urgent need for regulatory and institutional data protection frameworks to be updated, and for the creation of the institutions needed to implement them. Cybersecurity regulations should also be aimed at protecting essential infrastructure, where threats can endanger the provision of public services (including water, electricity, telecommunications, transport, the logistics chain and port systems).

(d) Promoting fair and competitive digital markets

- Generate capabilities for the regulation of competition in the digital age.
- Ensure that data are not used or kept in an anti-competitive manner in order to enable equitable access for all actors.
- Facilitate access to data (for example, through a market that can be accessed by paying a fee) and ensure an adequate level of protection for information in order to improve the competitive position of micro, small and medium-sized enterprises (MSMEs) in the digital economy.
- Develop strategies and policies that include the promotion of competition and data protection to guarantee market access without threats to the security of those involved. In the context of digitalization, defining data ownership is essential to regulation. It is therefore necessary to amend anti-monopoly policies to include privacy regulations.

(e) Strengthening regional digital cooperation

- Promote greater coordination within the region and subregional blocs to identify thematic priority areas and their operational management. Notable here is the Ministerial Conference on the Information Society in Latin America and the Caribbean, which provides a space to define shared principles and priorities by bringing together the 33 countries of the region and representatives of the private sector, civil society and the technical community.
- Launch a regional digital market that makes it possible to establish a collective strategy to increase trade, expand the digital economy and increase competition through regulatory consistency, the integration of infrastructure and the development of digital platforms, cross-border data flows and measures to facilitate trade. In this context, there could be further regulatory harmonization in subregional coordination mechanisms, such as the Pacific Alliance, the Central American Common Market, CARICOM and MERCOSUR.
- Implement mechanisms to encourage greater coordination between public policies and business strategies, taking into account forums for regional dialogue such as the Ministerial Conference on the Information Society in Latin America and the Caribbean, Ibero-American General Secretariat (SEGIB) and the Summit of the Americas.
- Increase the financing of digital development policies through greater participation of the private sector and international and regional development banks, and cooperation in the Americas and with Europe.

G. The care economy: creating jobs with equality

1. The structural challenges of gender inequality

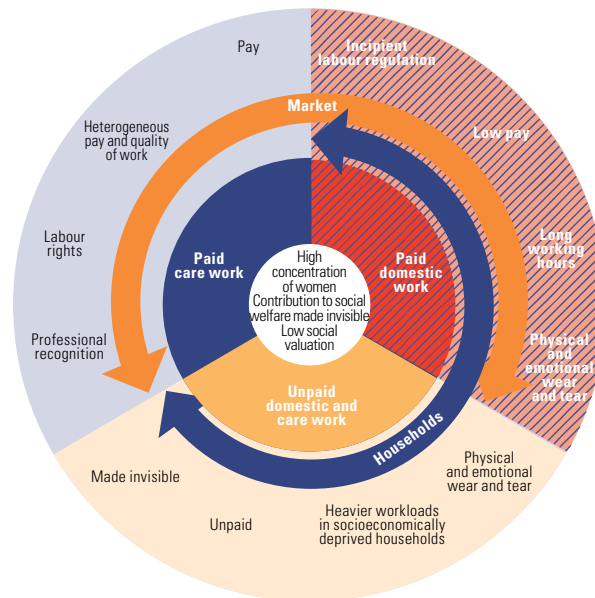
In Latin America and the Caribbean, gender inequality is a structural phenomenon, inseparable from its development model. In addition to the recent crisis caused by the COVID-19 pandemic, the region faces challenges that make it urgent to address gender gaps. The economic growth slowdown, rising inflation, increasing poverty and job losses reveal the entrenched difficulties of the current development model, which is also characterized by inequality and environmental deterioration. Compounding this are trends such as demographic and epidemiological transitions and changes in the composition and structure of families, which pose additional challenges to the design of public policies in terms of guaranteeing rights and social well-being.

Overcoming the structural challenges of inequality and moving towards a new pattern of development and, therefore, a change in the social organization of care, means identifying and closing the gaps that exist between care needs and the supply of accessible and quality services. It also implies denaturalizing gender roles and putting an end to the hierarchical power relations that underpin the current sexual division of labour.

The way in which households, communities, the market, and States satisfy care needs is significant not only from the standpoint of social reproduction and individual well-being, but also in terms of production, employment, and sustainable development. In this regard, feminist economics contributes to the debate on the economic role of domestic work and caregiving; it has highlighted the concept of the care economy as a space of goods, services, activities, relationships and values associated with the needs that are most basic and relevant for human existence and reproduction (Montaño and Calderón, 2010). The care economy encompasses all unpaid work that is performed within households, as well as the care provided on a paid basis through the labour market (see diagram IV.4). By relating the prevailing economic system to the way in which societies organize the care of their members, the concept of care is associated with the economic value it generates. Thus, care is made visible, which makes for better decision-making on how to organize resources and redistribute the benefits generated both in the commercial sphere and in households (ECLAC, 2019a).

The availability and quality of care services are directly related to employment levels and working conditions in the paid care sector, which mostly employs women (ILO, 2018). In turn, provision of accessible high-quality public or private services contributes to redistribution of responsibilities from households to the State and the private sector, which frees up women's time and helps to improve their economic autonomy. In this sense, the care economy comprises relations between paid and unpaid care work. In particular, it includes the provision of goods and services for households by paid domestic workers whose employment conditions reflect the undervaluation of care tasks carried out in the commercial sphere (ECLAC, 2019a).

Diagram IV.4
The care economy



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

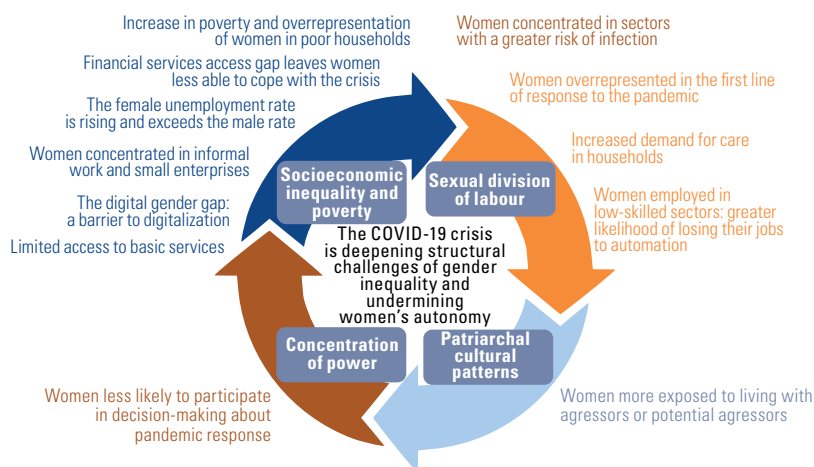
2. The COVID-19 crisis aggravated gender inequality

After the outbreak of the pandemic, the world, and the region more acutely, experienced an unprecedented situation in which the lockdowns and paralysis of many sectors of the economy had previously unimagined effects on people's daily lives. Households and health and education institutions, for example, had to adapt to new routines and ways of managing daily tasks, while other sectors that are major employers of female workers (paid domestic work, commerce and tourism) lost a large proportion of jobs. The pandemic brought into sharper relief the consequences of the sexual division of labour and the prevalence of patriarchal cultural patterns that assume women as the main caregivers, whether paid or unpaid (see diagram IV.5). This placed them in the situation of tension implied by front-line care, since more than 70% of health workers are women, who are also responsible for most of the care work undertaken in the home.

The pandemic also had a substantial effect on women's labour force participation rate, which stalled at around 50%. There were unprecedented job losses between the second quarters of 2019 and 2020, which affected women disproportionately (ECLAC, 2021j). As seen in section A of chapter III, this forced withdrawal from the labour market represented an 18-year setback in women's labour force participation rates. Despite an incipient recovery since 2021, progress remains slow and uneven, and female labour market participation lags behind the recovery in male rates. The decline in women's employment was especially pronounced in lower-income households and those with members who are care-dependent. The impact on employment has also been especially noticeable in the case of women with lower education levels, among whom job losses have been greater than for men with the same level of education and also greater than among women with higher education levels (ECLAC, 2022a).

Diagram IV.5

The COVID-19 crisis aggravated the challenges of gender inequality and threatens women's autonomy



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Paid female domestic workers play a crucial role in caring for children, and for sick and dependent persons, as well as in the daily functioning of households. In 2019, 13.6 million people in the region were employed in paid domestic work (UN-Women/ILO/ ECLAC, 2020). Of that total, 91.5% are women, and many of them Afrodescendants, indigenous or migrants. In this sector, 76% of women do not have pension coverage; and in some countries the proportion is over 90% (ECLAC, 2021b and 2022a).

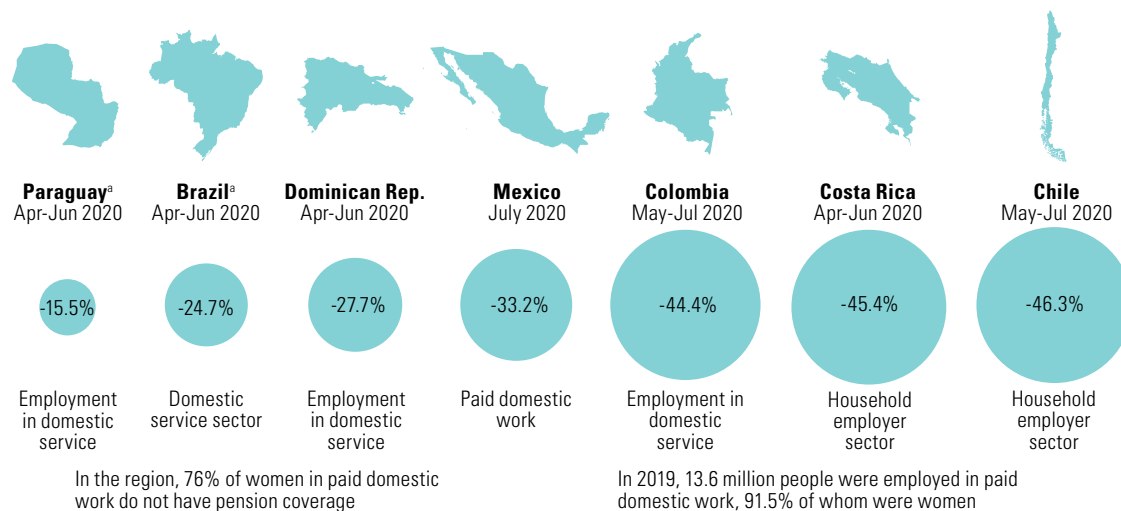
Among female domestic workers, 70.4% were affected by quarantine measures, reduced economic activity, unemployment, cuts in hours, or loss of wages (ILO, 2020). Unions of domestic workers in the region described a similar situation (UN-Women/ILO/ ECLAC, 2020). They report that contracts were cancelled without just cause; working conditions were modified unilaterally, and working time and pay were reduced. In other cases, women workers were forced to remain at their workplaces, away from their families and without adequate rest.

As a result, many women employed in this sector, especially those without a formal contract, faced increased uncertainty as to whether they would be paid. Those who continued to attend their place of work saw their workloads increased—for example, because they had to care permanently for children who were at home owing to school closures. They also had to perform more housekeeping tasks to prevent infection and even meet the health-care needs of household members. The latter, in addition to exposing them to infection from the disease, required them to perform tasks for which they are not necessarily trained (ECLAC, 2020b). In extreme cases, many workers were dismissed. A number of national statistical institutes in the region have published labour market figures that provide information on this situation (see figure IV.25). In Brazil, in the April–June 2020 quarter, the number of people employed in the domestic service sector decreased by 24.7% relative to the same period in 2019. In Chile, the households-as-employers sector posted a year-on-year variation of -46.3% in female employment, which means that there were around 150,000 fewer women in this

sector between the months of May and July 2020. In Colombia, in the May-July 2020 quarter, the number of women employed in domestic service decreased by 44.4% compared to the year earlier period. Meanwhile, in Costa Rica, the household sector as employers suffered a 45.5% year-on-year drop in female employment during the April-June 2020 quarter. In Mexico, a 33.2% reduction in female employment in domestic work was reported in July 2020. In Paraguay, the drop in domestic employment was 15.5% in the second quarter of 2020 (ECLAC, 2021d); and, lastly, in the Dominican Republic, employment in this sector declined by 27.7% in the second quarter of that year.

Figure IV.25

Latin America (7 countries): variation in women's employment in paid domestic work, around the second quarter of 2020 with respect to the same quarter of 2019 (Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official sources.

^a In the cases of Brazil and Paraguay, the variation in employment corresponds to both men and women.

Interruptions in production chains and restrictions on personal mobility had serious consequences in all sectors of production. In addition to the heterogeneous scale of the decrease in employment in various sectors, there were large differences in the duration of the impacts. Although the sharpest contraction occurred in the second quarter of 2020 in all sectors, the partial reopening of the economies in the third quarter allowed a slow recovery to begin (ECLAC, 2021c and 2021d).

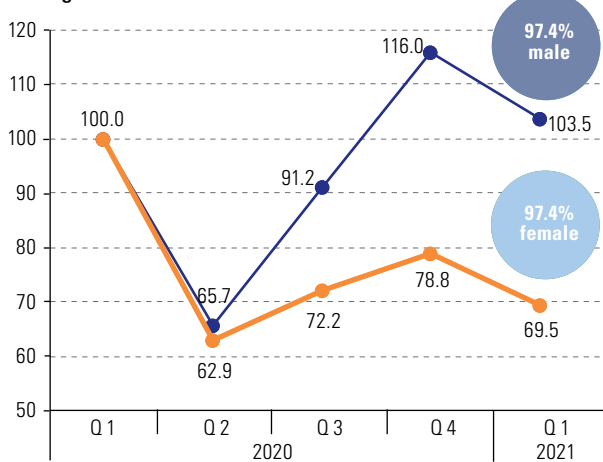
A worrying and alarming fact about the re-engagement of men and women in the labour market is that the history of previous crises is repeating itself: highly masculinized sectors recover quicker than those with a greater presence of women. In the first quarter of 2021, for example, the construction sector had regained employment levels similar to those prevailing before the onset of the pandemic, while the accommodation and food sector experienced a slower recovery (ECLAC, 2021b). Paid domestic work has been unable to recover pre-pandemic employment levels (see figure IV.26). In this regard, prioritizing the employment of women, especially those from lower-income households, is crucial for reactivation of the paid domestic work sector, which is fundamental to the care economy.

Figure IV.26

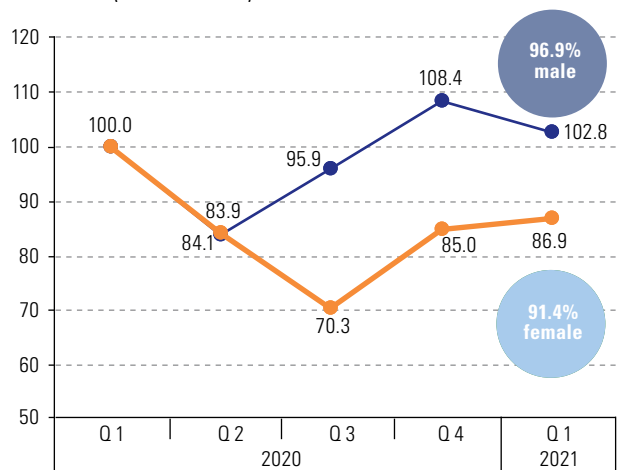
Latin America (8 countries): trend of employment levels in the construction and paid domestic work sectors, first quarter of 2020–first quarter of 2021

(Index, first quarter 2020=100)

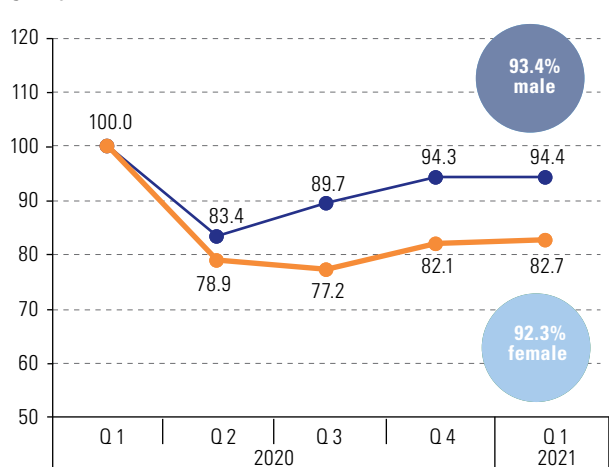
A. Argentina



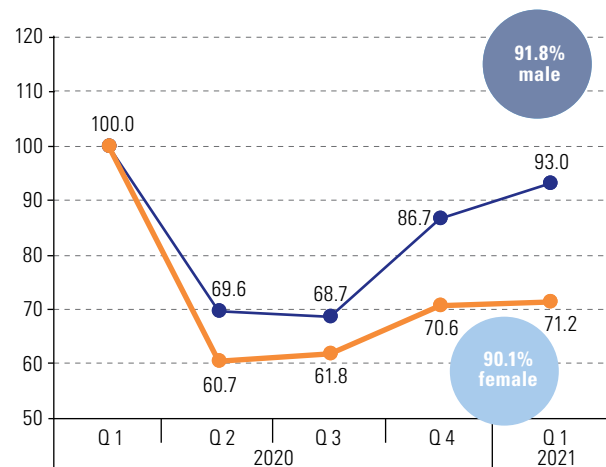
B. Bolivia (Plur. State of)



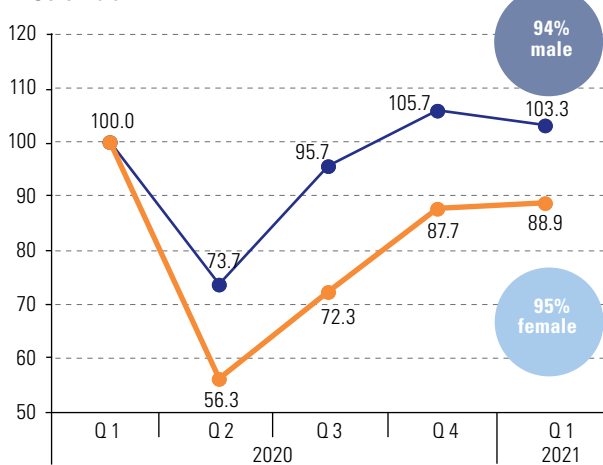
C. Brazil



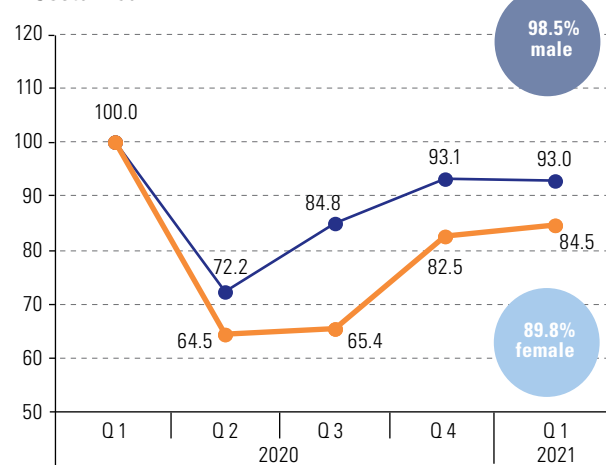
D. Chile



E. Colombia



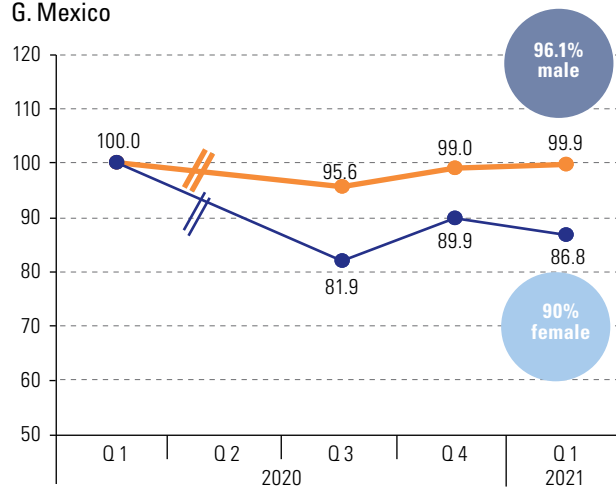
F. Costa Rica



— Employment trends in the construction sector
● Proportion of men in the construction sector

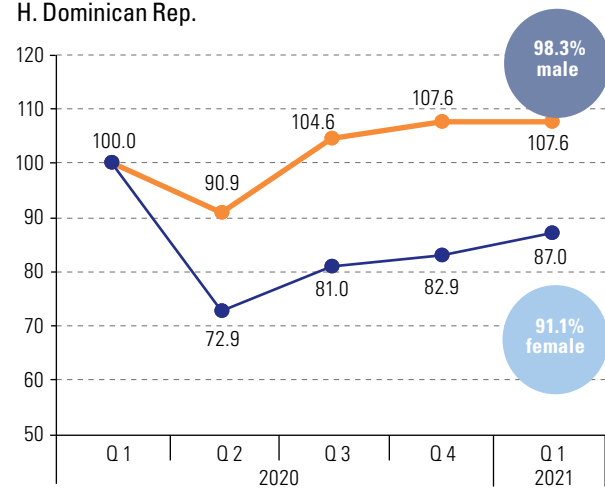
— Employment trends in the private household sector
● Proportion of women in the private households sector

G. Mexico



— Employment trends in the construction sector
● Proportion of men in the construction sector

H. Dominican Rep.



— Employment trends in the private household sector
● Proportion of women in the private households sector

Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Social Panorama of Latin America, 2021* (LC/PUB.2021/17-P), Santiago, 2022.

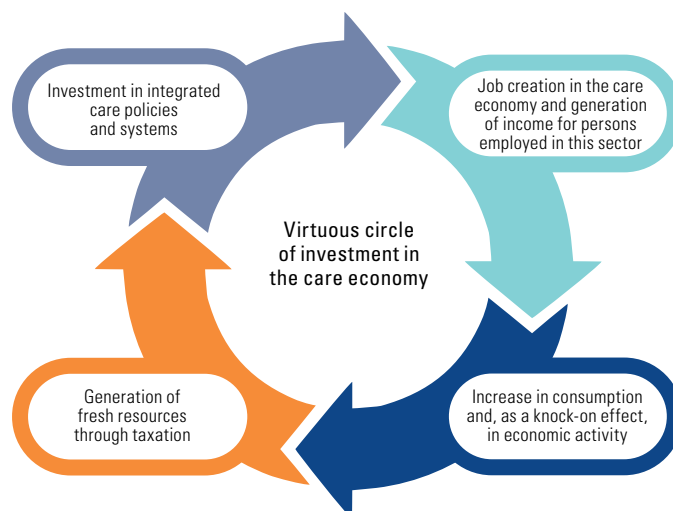
In addition to strategies to restore women's employment in this sector, it will be essential to maintain a focus on quality employment with guaranteed rights. The domestic work sector has multiple areas of potential, if policies are designed to professionalize it and certify skills and know-how. This would make it possible not only to distinguish and professionalize tasks within what is today paid domestic work, but also to offer higher quality services in households with greater levels of protection for those who provide them. The conventions and recommendations of the International Labour Organization (ILO), such as the Domestic Workers Convention, 2011 (No. 189) and the Domestic Workers Recommendation, 2011 (No. 201) of 2011, are targeted in this direction.

3. The economic valuation of unpaid work demonstrates its galvanizing potential

Investment in care policies is strategic (ECLAC, 2021b), because it makes it possible to break the vicious circle of poverty and exclusion, while at the same time generating a virtuous circle with multiple positive social and economic effects (UN-Women/ECLAC, 2022) (see diagram IV.6). Firstly, such investment alleviates women's care overload and reduces their opportunity cost of participation in the labour market. Secondly, it has the capacity to generate jobs and stimulate other sectors of the economy, public works or indirect services linked to care. In turn, this increase in economic activity can contribute to offsetting the initial investment through higher tax revenues. Lastly, investment in care services and infrastructure contributes directly to people's well-being, especially if the quality of the services provided is regulated and monitored. Investment in childcare, for example, would bring long-term benefits, such as greater physical and cognitive development of children, especially those living in poverty (UN-Women/ECLAC, 2022). In this context, care policies, with an expansion of public services, have the potential to become one of the drivers of sustainable and inclusive development.

Diagram IV.6

The virtuous circle of investing in the care economy



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

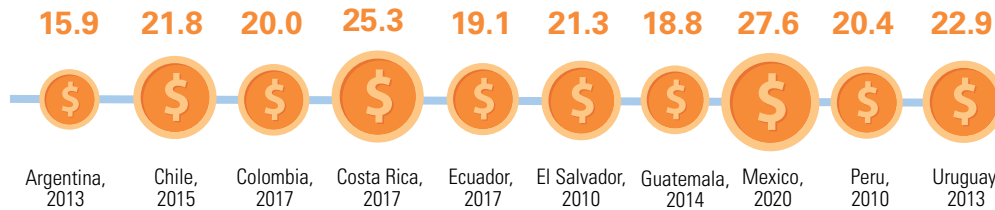
In terms of the necessary investments and their galvanizing effects, studies conducted in Uruguay (De Henau and others, 2019) and in Mexico (UN-Women, 2020) indicate that promoting universal and free childcare systems (with different parameters in each case) would entail an annual gross investment of 2.8% of GDP in Uruguay and an additional expenditure of 1.2% of GDP in Mexico. At the same time, women's employment would increase by 4.2 percentage points in the former country and total employment would increase by 3.9% in the latter. The new jobs would generate tax revenues that would reduce the net financing gap by 1.4% of GDP in Uruguay. In Mexico, the additional revenue would represent 0.29% of GDP. Similarly, a study conducted for seven Latin American countries, along with Canada and the United States, estimated that gross investment in childcare systems and systems for permanently dependent persons, together with an extension of parental leave, would amount to a total of 4.1% of GDP⁴³This would also generate an increase of 10.6 percentage points in the employment-to-population ratio for women (and 2.7 percentage points for men), projected to 2035 (De Henau, 2022). The higher tax revenue generated would reduce the investment needed to universalize and extend these systems to 3.1% of GDP (projected). A study for Colombia estimated that if the State and the market were to take responsibility for the care that is currently provided on an unpaid basis, the energizing effects of this new production sector would contribute 33.7% of GDP (López Montaña, 2022).

The Regional Gender Agenda and the 2030 Agenda for Sustainable Development establish the importance of recognizing the value of unpaid work, as well as the need to create instruments to measure the time use by men and women. Thus, in recent decades, progress has been made in developing methodologies to measure the value-added of care work (ECLAC, 2021b). In the region, ten countries have calculated the monetary contribution of unpaid work in households, and five of them have published the corresponding satellite accounts (Colombia, Costa Rica, Ecuador, Mexico and Peru), based on calculations made in the framework of national accounts and as GDP satellites. Approximations made in the region value this type of work at between 15.9% and 27.6% of GDP, depending on the country (see figure IV.27). On average, 74% of this contribution is made by women (Vaca Trigo and Barón, 2022).

⁴³ Of this, 1.4 percentage points correspond to childcare systems.

Figure IV.27

Latin America (10 countries): value of household unpaid work relative to gross domestic product, around 2015
(Percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of the valuation of unpaid work made by each country's national accounts agency, except for Argentina, for which the calculations were based on Ministry of Economic Affairs, *Los cuidados, un sector económico estratégico: medición del aporte del trabajo doméstico y de cuidados no remunerado al producto interno bruto*, 2020 [online] https://www.argentina.gob.ar/sites/default/files/los_cuidados_-_un_sector_economico_estragico_0.pdf; and Uruguay, for which the calculations were based on S. Salvador, "La valoración económica del trabajo no remunerado", *Los tiempos del bienestar social: género, trabajo no remunerado y cuidados en Uruguay*, K. Batthyány (ed.), Montevideo, National Institute of Women (INMUJERES), 2015.

The magnitude of unpaid domestic work and care relative to GDP shows the economic importance of this work, in contrast to its low social valuation; and it highlights the scant use made of this information in economic policy decision-making. In Argentina, for example, the economic value of unpaid domestic and care work represented 15.9% of GDP in 2013, which is greater than the relative weight of the largest sectors of the economy, manufacturing industry (13.2%) and commerce (13%) (Argentina, Ministry of Economic Affairs, 2020).

In Chile, the monetary value of unpaid domestic and care work also exceeds that of the largest sector of the economy. At 21.8% of GDP the value of unpaid domestic and care work is almost double that of the financial and business services sector (11.8%), four times that of construction and almost eight times that of the agriculture, forestry and fishing sector. The share of unpaid domestic work in expanded GDP increased by 4.8 percentage points, from 20.8% in 2015 to 25.6% in 2020 (Avilés-Lucero 2020).

In El Salvador, the monetary value of domestic and care work (21.3% of GDP) is estimated to exceed the value-added of manufacturing industry (16.1%) and commerce (11.4%) in 2010 (Vaca Trigo and Baron, 2022).

Data for Mexico show that hours spent on domestic and care work increased in 2020, mainly in activities linked to health care within the home (which increased by 9.4% relative to 2019), followed by home cleaning and maintenance (7.5%), school assistance activities (7.4%) and support provided to other households (7.3%). Because of this, the per capita net economic value of household unpaid domestic and care work increased by 11.1% over the previous year (INEGI, 2021).

For all of the foregoing reasons, gender inequality makes the potential growth of the economy inefficient. Women's unpaid work overload is an obstacle to their full participation in the labour market. Consequently, freeing up women's time and guaranteeing their economic autonomy produces positive externalities that have an impact on the rest of the economy. As stated in the Santiago Commitment⁴⁴ and analysed in detail in chapter V, it is essential to have fiscal policies that generate progressive revenue, invest in care and ensure sufficient spending so that policies guarantee access to quality care services and are geared towards women's autonomy, in order to advance sustainable development with equality.

⁴⁴ Approved at the fourteenth session of the Regional Conference on Women in Latin America and the Caribbean, held in Santiago, 28–31 January 2020.

H. Sustainable tourism for job creation

1. The regional vision

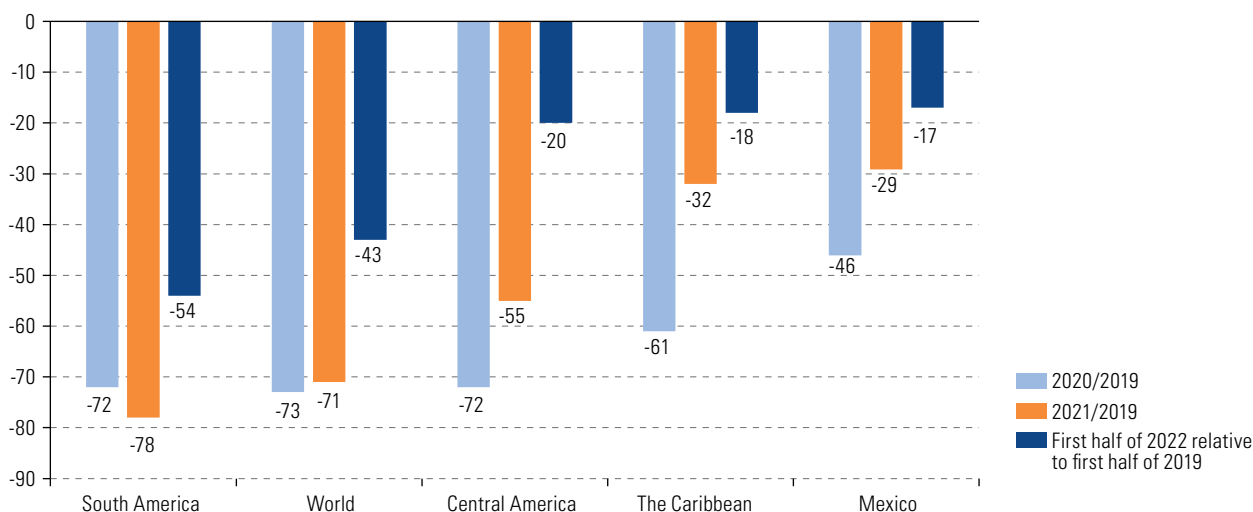
While the pandemic led to a widespread slowdown in global economic activity, its impact on the tourism sector was devastating. As a result of the adoption of severe restrictions on international mobility in virtually all countries, 2020 was the worst year for tourism activity since records began. Globally, the number of international tourists fell by 73% compared to 2019, while tourism service export revenues fell by 63%. Since then, progress in vaccination processes and the gradual lifting of border restrictions have allowed for a recovery in international tourism. Nonetheless, in 2021, this indicator was still 71% below its 2019 level (see figure IV.28).

International tourist arrivals nearly tripled from January to July 2022 (+172%) compared to the year-earlier period, bringing the sector to 61% of the pre-pandemic level. This recovery was fuelled by the release of strong pent-up demand for international travel, as well as the easing or lifting of travel restrictions thus far (as of 19 September 2022, 86 countries no longer had pandemic-related restrictions). However, the prospects for the remainder of the year remain highly uncertain. Firstly, the inflationary pressures that could already be discerned in 2021 have intensified in the wake of the war in Ukraine, with a particular impact on the price of oil, making travel more expensive. Secondly, the tightening of monetary policy in the United States, the United Kingdom and other advanced economies in response to inflation rates not seen since the 1980s has diminished their growth prospects and, concomitantly, those of the world economy.

Since the start of the pandemic, tourism activity has trended very unevenly at the subregional level. South America and Central America were the subregions in which international tourist arrivals contracted most sharply in 2020; and the situation worsened in 2021. In the half year from January to July 2022, international tourist arrivals in the Caribbean were still 18% below their level in the same period of 2019; in Central America, the figure was 20% lower and, in South America, 54% lower.

Figure IV.28

South America, the Caribbean, Central America, Mexico and the world: year-on-year variation in international tourist arrivals, 2020, 2021 and 2022 relative to 2019 levels (Percentages)

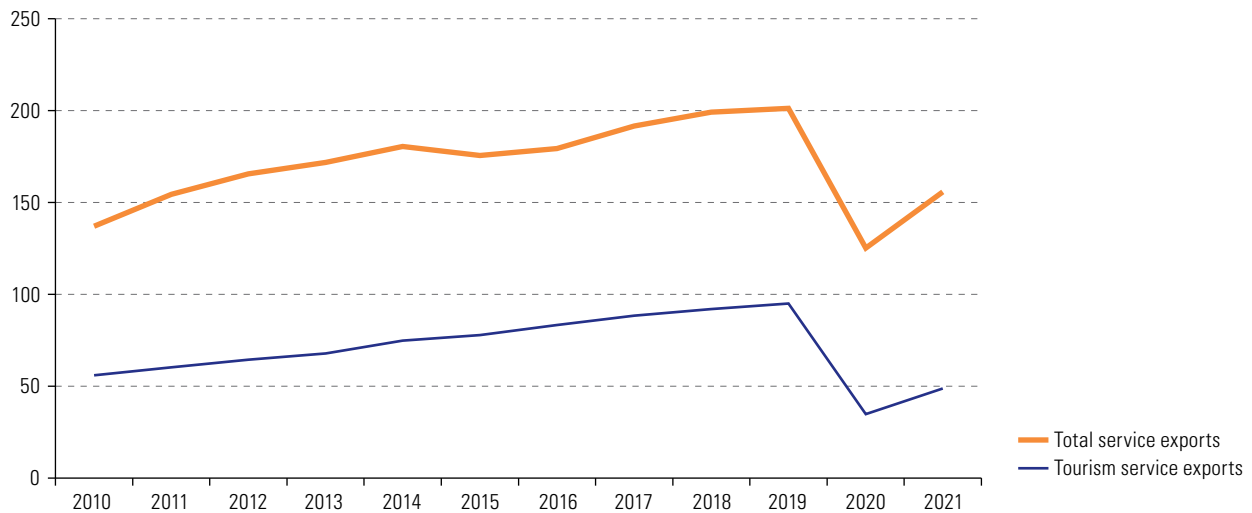


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Tourism Organization (UNWTO), UNWTO Tourism Data Dashboard [online] <https://www.unwto.org/tourism-data/unwto-tourism-dashboard>.

The fall and subsequent partial recovery of international tourist arrivals since the start of the pandemic has its correlate in the trend of regional exports of tourism services (see figure IV.29). In 2020, these declined more steeply than total services exports (-63% and -38%, respectively), although in 2021 they recovered relatively more strongly (+40% and +24%, respectively). Nonetheless, the value of the region's service exports in 2021 was still below the 2010 level in current dollar terms.

Figure IV.29

Latin America and the Caribbean: total service exports and tourism service exports, 2010–2021
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Conference on Trade and Development (UNCTAD), UNCTADstat [online database] <https://unctadstat.unctad.org/EN/>.

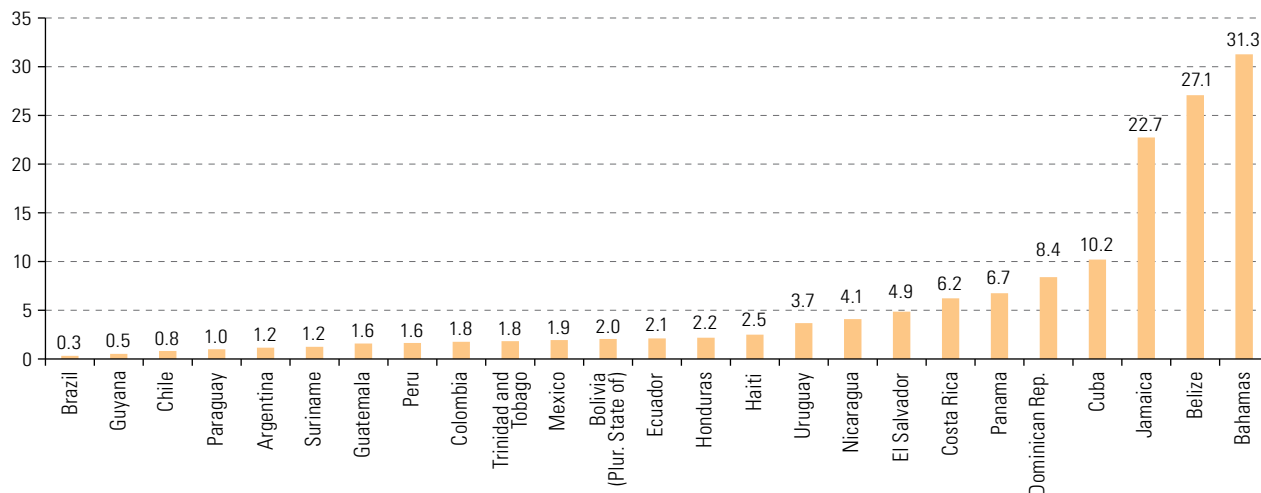
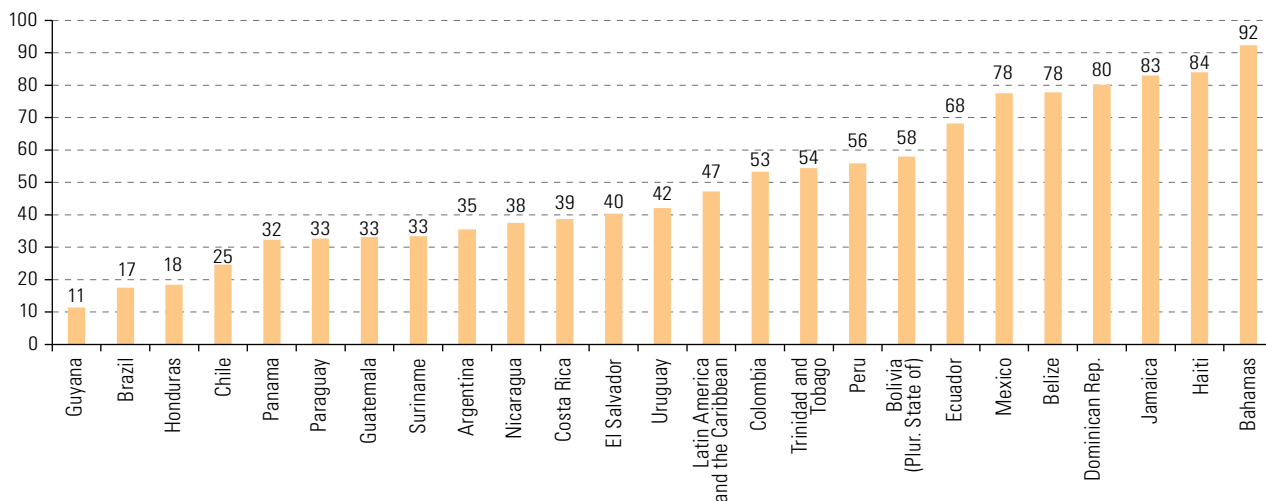
The disparity with which international tourism has trended in the different subregions is largely explained by the intensity and duration of the cross-border restrictions adopted in each case. In general, South American countries imposed more stringent controls and have maintained them for longer than the other countries in the region (ECLAC, 2021e).⁴⁵ The earlier lifting of restrictions in countries such as the Dominican Republic, Jamaica and Mexico was likely due partly to the sector's great economic importance, in terms of its share in both GDP and total service exports (see figure IV.30). In these three countries, the share of tourism in total service exports before the pandemic was around 80%, well above the regional average of 47%, which in turn was double the world average of 24%.

Prospects for international tourism in Latin America and the Caribbean for the remainder of 2022 is subject to the same sources of uncertainty that affect tourism globally. However, in the case of the region, the outlook is also clouded by the slowdown in economic activity, with regional GDP projected to grow by 2.7% in 2022 (ECLAC, 2022f). Tourism activity in South America is likely to continue to lag behind that of the rest of the region, as its output is forecast to expand by just 1.5%; and South American countries are, in general, more dependent on tourism from within the subregion than Mexico and the countries of the Caribbean and Central America (ECLAC, 2021e).

⁴⁵ As of 10 June 2022, the only countries in the region that were not applying any type of COVID-19-related restriction on international travel were Costa Rica, Grenada, El Salvador, Jamaica and Mexico (UNWTO, n/d).

Figure IV.30

Latin America and the Caribbean (24 countries): share of tourism service exports in GDP and in total service exports, 2019
(Percentages)

A. Share of GDP**B. Share of total service exports**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of CEPALSTAT [online database] <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en> and United Nations Conference on Trade and Development (UNCTAD), UNCTADstat [online database] <https://unctadstat.unctad.org/EN/>.

2. The tourism sector in Central America and Mexico

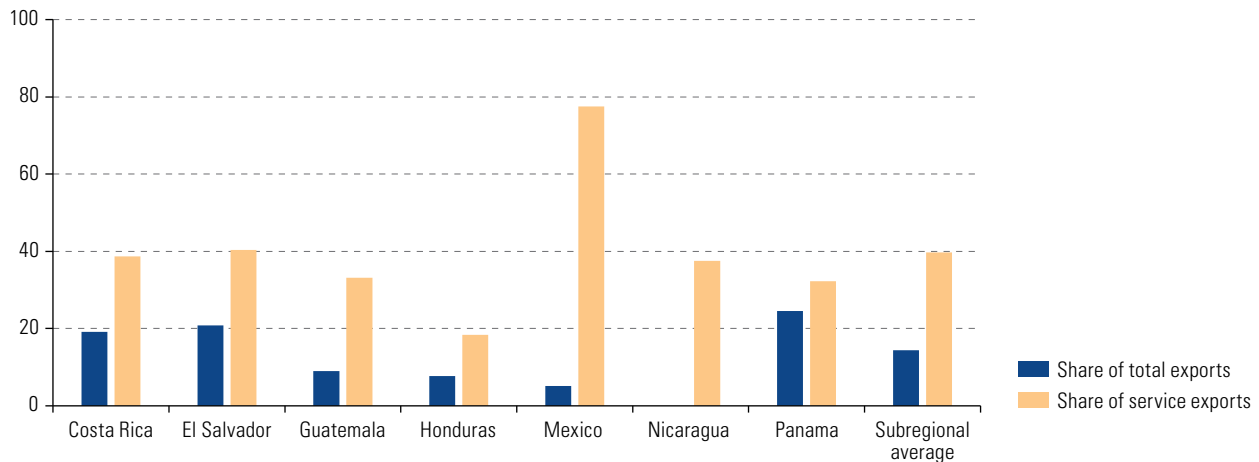
Tourism is a key generator of foreign exchange, income and employment in all countries in the Central America and Mexico subregion.⁴⁶ In 2019, it accounted for 14.4% of the subregion's exports of goods and services and 39.7% of its service exports. Tourism accounts for a large share of total exports in Costa Rica, El Salvador and Panama: the average for the three countries is 21.5% (see figure IV.31A). The tourism economy, including all related subsectors, represented 11.5% of total GDP and 11.6% of formal employment in the countries included in figure IV.31B.

⁴⁶ In this text, the subregion includes Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama.

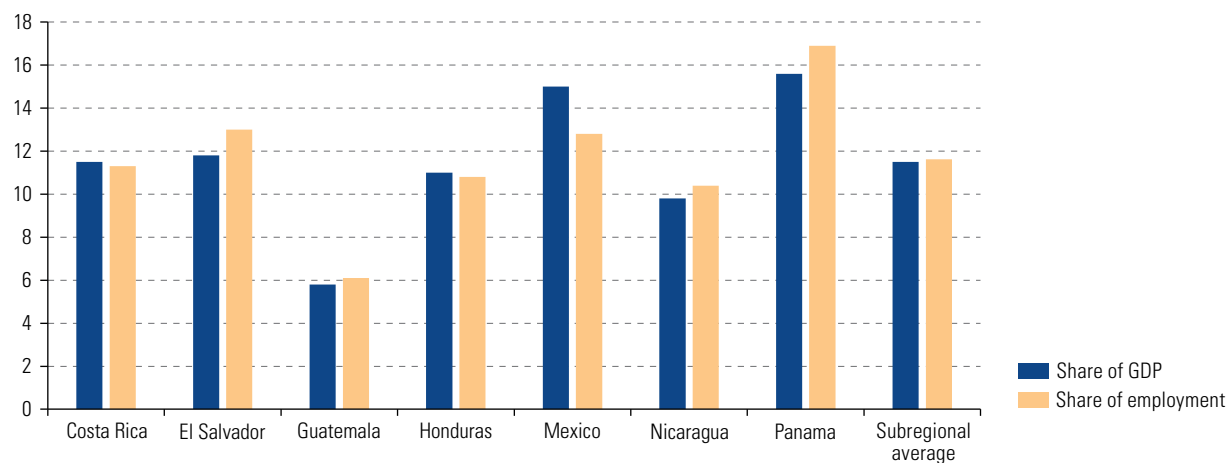
Figure IV.31

Central America and Mexico: share of tourism in exports, GDP and employment, 2019
(Percentages)

A. Share of tourism in total exports and in service exports



B. Share of the tourism economy in total GDP and employment



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, DataBank and World Development Indicators [online database] <https://datatopics.worldbank.org/world-development-indicators/>, and World Travel and Tourism Council, *Economic Impact Reports* [online] <https://wttc.org/Research/Economic-Impact>.

Note: Analysis based on available data. In the case of the share of total exports, the international tourism receipts index was used, which captures spending by international visitors, including payments to domestic carriers for international transportation. The share of service exports was calculated using the travel services index, which corresponds to services purchased by travellers for their own use during visits of less than one year to a given economy, whether for business or personal purposes.

Border closures in some countries, in conjunction with the health measures adopted to address the pandemic and its indirect effects, led to a reduction in global tourism activity that resulted in sharply lower revenues in the subregion. International visitor spending between 2019 and 2020 declined from 68% to 80% in all countries except Mexico (-49%) (WTTC, 2022). The resulting increase in unemployment left a large segment of the working population on the brink of poverty owing to a lack of social and employment protection.

Despite the economic losses caused by travel restrictions and loss of traveller confidence, new global demand trends and business opportunities have emerged in the last two years, such as domestic tourism, travel close to home, open-air activities, the consumption of nature-based products and rural tourism (WEF, 2022). The changing nature of work, owing to the increasing number of firms becoming virtual and the growing

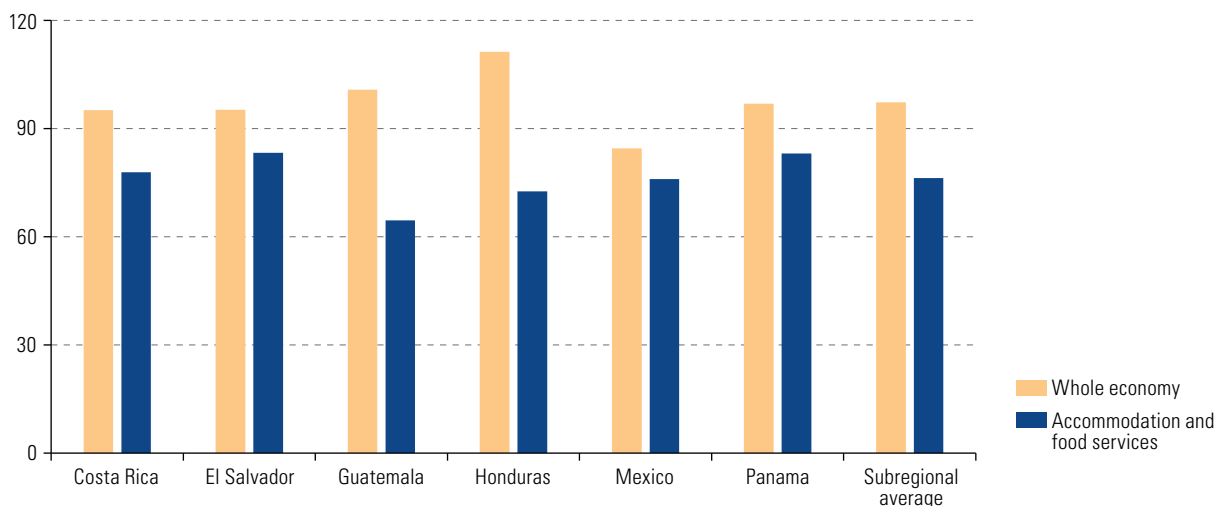
proportion of the workforce becoming independent or “digital nomads” who are willing to travel, has also led to a trend toward “bleisure” travel, where business travel is coupled with leisure activities (CVENT, 2021). To meet these demands, new products were created, such as more flexible booking and cancellation policies to mitigate the uncertainty surrounding travel regulations, as well as packages with reduced rates for extended stays in accommodation that offers services related to information and communications technology (ICT) and boardrooms for occasional business meetings (Skinner, 2021).

The reduction in tourism and human activity also created temporary opportunities for the recovery of stressed ecosystems, and it has resulted in lower than usual concentrations of plastics and other waste material. Moreover, the pandemic drew attention to the use of single-use plastics; and the domino effect it set in motion has the potential to speed up new policy approaches and public and private solutions. It also raised the profile of rural tourism and tourism in areas with healthy environments, which represented a twin opportunity: firstly, it strengthened demand and awareness of a type of tourism that values natural areas; and secondly, it opened up opportunities for participation in the tourism value chain for regions rich in natural spaces, but which participated little in the tourism market. The risks are also clear, especially those related to the overload of tourists in national parks and the pressure exerted on natural resources and public services in rural areas.

Women’s labour market and business participation in tourism is high in the subregion. In 2019, women accounted for an average of 63.7% of formal employment in accommodation and food services; and half of all tourism businesses in Latin American and Caribbean countries are owned by women (World Bank, 2017). Nonetheless, tourism earnings are unevenly distributed and depend on gender, the level of informality, and the geographic location of the tourism destination. Women tend to work in administration and basic services, such as cleaning, room services or catering, at lower hierarchical levels than men and with lower pay (see figure IV.32). They tend to occupy positions that do not require digital skills, which diminishes their opportunities for skill development. Within female employment, there is clear discrimination based on factors such as indigenous ethnicity, area of residence and stage of life. Considering the high rate of participation by women in tourism microenterprises with fewer than five employees, the limited access to financing available to these firms may result in higher levels of female unemployment in the event of crises and external shocks (ECLAC, 2021i).

Figure IV.32

Central America and Mexico: women’s income relative to that of men, 2019
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Labour Organization (ILO), ILOSTAT [online database] <https://ilostat.ilo.org/>.

Note: Analysis based on the available data. Data for accommodation and food service activities (ISIC Rev. 4) were used as a proxy for employment in the tourism sector. Data for Honduras cover up to the second quarter and for Panama up to August. The minimum age of coverage was set at 16 years in the case of El Salvador.

In addition to the strong presence of women, tourism employment is also characterized by a high degree of informality and the consequent vulnerability of its workers. The sector has a large proportion of micro-, small and medium-sized enterprises (MSMEs),⁴⁷ which often find it difficult to obtain financing, take advantage of the opportunities of the digital economy and make use of new technologies. This renders them less resilient to crises; and many of their workers do not receive employment benefits—including continuous wage flows of and legal and social protection—for long periods of time, not only because of crises, but also because of its inherent seasonality.

The sector often has services that are highly concentrated in a few territories, leading to major economic, social and environmental gaps in many rural areas. These gaps include a shrinking population—particularly of working age—resulting from increased migration within and outside the country in search of employment opportunities in urban and other successful tourist areas; limited access to infrastructure, services and connectivity; a scarcity of quality job opportunities; low levels of economic diversification and heavy reliance on natural resources.

Natural resources are a central element of the tourism attracted by the subregion, so it is essential to preserve and manage them efficiently. A tourist destination rich in natural resources that does not manage the impact that visitors have on its natural surroundings can cause environmental damage through inappropriate management waste and wastewater, road congestion, and the destruction of natural habitats and the ecosystems that regulate the natural space. In a business-as-usual scenario, global tourism would generate increases of 154% in energy consumption, 131% in greenhouse gas emissions, 152% in water consumption and 251% in solid waste disposal by 2050 (UNEP/UNWTO, 2012). Tourism's close link to natural resources also means that it can be affected greatly by climate change, and also by natural and anthropogenic disasters.

To respond to these problems, especially those arising from the pandemic, various initiatives and policies have been implemented over the last two years with an immediate and medium- to long-term focus. While the immediate measures concentrated on health-related issues, the medium- and long-term measures targeted economic and social recovery, including the recovery of the health sector.

- **Preservation of employment and employee income.** Monetary assistance was granted in various forms to provide temporary income support to the majority of formal workers and business owners. The greatest problem was the effect of the reduction in tourism on informal workers. Many governments in the subregion adopted additional income support measures to help vulnerable people not covered by existing social programmes.
- **Business support, particularly for MSMEs.** These measures included exemptions, reductions or temporary extensions for the payment of taxes, the provision of subsidies, partial or total payment of wages, and support to provide social protection to employees. The Costa Rican Institute of Tourism, for example, agreed to a four-month moratorium on the payment of taxes related to airline tickets (Costa Rican Institute of Tourism, 2020). Production support mechanisms were also put in place to help MSMEs operate by digitalizing their activities.
- **Disaster risk management.** The sudden and deep recession generated by the measures adopted in the tourism sector highlighted the need to prepare better for future crises.⁴⁸ Resilience in tourism encompasses: (i) health resilience to ensure safe tourism; (ii) social resilience to address specific issues of gender, precariousness and informality; (iii) financial and business resilience, particularly among MSMEs; (iv) environmental resilience; and (v) digital and inclusive innovations to foster alignment between the needs and trends of travellers, local firms, and investors (UNDP/EU-LAC Foundation, 2022).

⁴⁷ Micro-, small and medium-sized enterprises account for 98.7% of tourism-related businesses in Costa Rica (BCCR, 2018) and 99.8% in Mexico (INEGI, 2019).

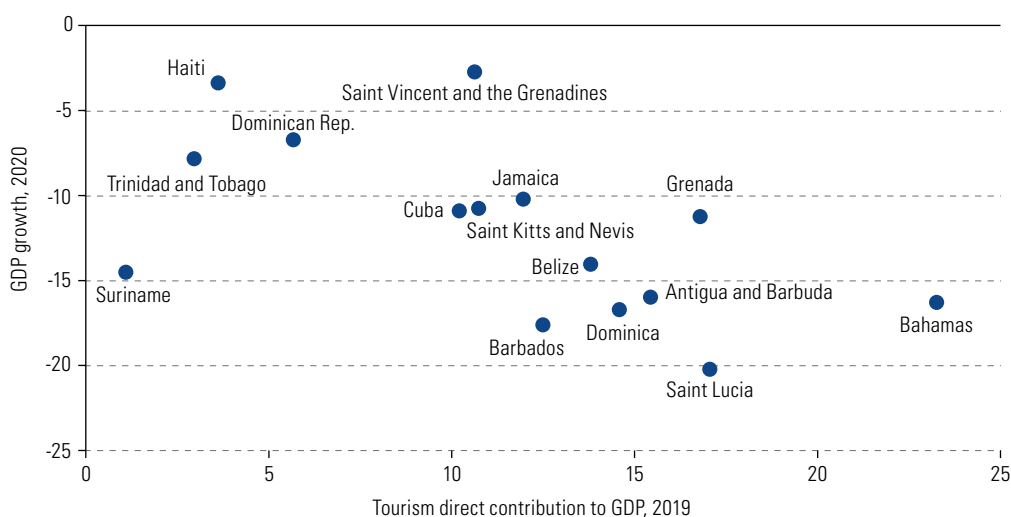
⁴⁸ Domestic tourism is a strategic pillar for resilience in the face of future crises. In Mexico, for example, domestic tourists generate 83% of the sector's revenues (INEGI, 2019); and, in Costa Rica, domestic visitors account for 54% of visits to national parks (Núñez Zúñiga, 2020). Domestic tourism promotion has been hampered by the fact that many countries in the subregion rely largely on international tourists, owing to problems with domestic demand and the domestic tourism-oriented market.

3. The situation of the tourism sector in the Caribbean

Following the onset of the pandemic in 2020, governments around the world imposed travel restrictions to limit the spread of COVID-19 in their countries. The Caribbean was no exception: by April and May 2020, the number of visitors to the subregion had collapsed to zero or near zero in several countries and territories.⁴⁹ Unlike other Latin American subregions, tourism is essential to most Caribbean economies. In more than half of them, the direct contribution of tourism to GDP exceeds 10%, and its indirect contribution is even higher. Given the importance of tourism in the subregion, travel restrictions associated with the pandemic had a major effect on its economic performance. In 2020, all Caribbean countries saw their economies contract (except Guyana, which grew by 43.5%); and the magnitude of the contraction was directly related to the importance of tourism in each country (see figure IV.33).

Figure IV.33

The Caribbean (15 countries):^a impact of coronavirus disease (COVID-19) and contribution of tourism to GDP, 2019 and 2020 (Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC) and World Travel and Tourism Council (WTTC).

^a Excludes Guyana.

In 2020,⁵⁰ total annual arrivals in the Caribbean plummeted by 70%, and, in 2021,⁵¹ the number was still 54% below that recorded in 2019. Most of the increase in arrivals represented tourists from the United States, whose numbers increased by 116%. Visits from Canada were down sharply (-72%), mainly owing to the Canadian government's decision to suspend flights to the Caribbean from January to April to discourage vacation travel. Arrivals from Europe and all other countries grew by 41% and 62%, respectively.

The pandemic hit the cruise industry harder than stopover tourism. While the latter has started to recover by the second half of 2020 (see figure IV.34), the United States Centers for Disease Control and Prevention (CDC) implemented a no-sail order for cruise ships in that year. Most of them did not return to Caribbean countries until mid-2021. Cruise ship arrivals in the Caribbean were down by 69% in 2020⁵² and by 45% in 2021.⁵³

⁴⁹ In this section, the Caribbean refers to Antigua and Barbuda, the Bahamas, Barbados, Belize, Cuba, Dominica, the Dominican Republic, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago. Arrivals data are not available for Haiti or Suriname after 2019.

⁵⁰ In 2020, the steepest declines occurred in Saint Kitts and Nevis (-78%), the Bahamas (-77%) and Cuba (-75%), while the smallest were recorded in Antigua and Barbuda (-56%) and the Dominican Republic (-63%). From 2020 to 2021, total annual arrivals grew by 55%.

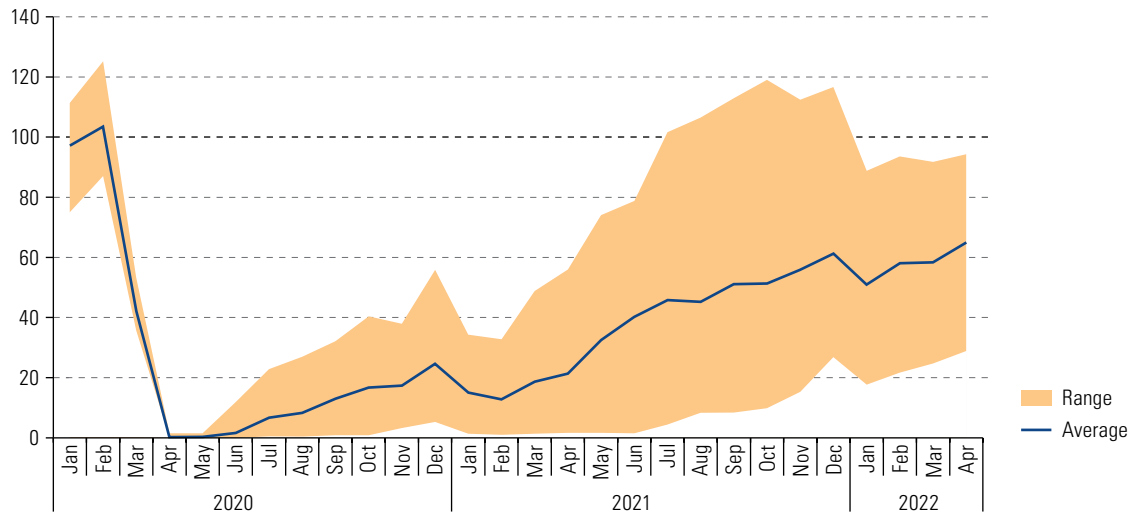
⁵¹ In 2021, the largest increases in arrivals were recorded in the Bahamas (+111%), the Dominican Republic (+108%) and Guyana (+82%), while the steepest declines occurred in Cuba (-67%), Dominica (-32%) and Saint Kitts and Nevis (-32%).

⁵² These data correspond to Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.

⁵³ The smallest decrease in 2021 occurred in the Bahamas (-16%), while reductions of more than 38% were observed in the rest of the countries. Passenger arrivals in Grenada and Jamaica plummeted by more than 80%; and they collapsed entirely in Trinidad and Tobago, since the country did not receive any cruise ships in 2021.

Figure IV.34

The Caribbean: average monthly stopover tourism, January 2020–April 2022, compared to 2019 levels (Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from the Caribbean Tourism Organization (CTO).

The recovery in the subregion has been uneven: while some economies recovered quickly, others continue to lag behind. During the initial lockdowns in April and May 2020, no country recorded arrivals growth of more than 2% over the 2019 levels. However, in June and July 2020, the countries began to reopen their tourism industries, and stopover tourism started to pick up. By December 2020, five countries (Antigua and Barbuda, the Dominican Republic, Guyana, Jamaica and Saint Lucia) had recorded arrivals growth of more than 30% relative to a year earlier. These countries, along with Saint Vincent and the Grenadines, also exhibited the highest increase in arrivals in 2021 (over 70% for at least one month of that year).

Antigua and Barbuda and the Dominican Republic were the only two countries in which the number of arrivals grew by more than 100% in any month since 2020, with the Dominican Republic recording a 119% increase in October 2021. The slowest recoveries were in Cuba, Dominica, Saint Kitts and Nevis, and Trinidad and Tobago, none of which recorded more than 20% growth in total annual stopover tourism compared to 2019. These four countries maintained some of the most stringent travel restrictions well into 2021, such as mandatory quarantine even for vaccinated travellers. In addition, Trinidad and Tobago's borders remained closed even for its own citizens until July 2021.

In 2022 thus far, Antigua and Barbuda and the Dominican Republic are the only countries in which arrivals have increased by more than 90% relative to the 2019 levels in any month. Arrivals have posted growth of more than 40% over the previous year in at least one month in all countries except Cuba and Dominica, although they fell in January in most Caribbean countries owing to the global increase in infections with the omicron variant of coronavirus. Many countries have relaxed COVID-19 health and safety restrictions significantly, for example by lifting the requirement to wear face masks indoors and on aircraft. Thus, Canada no longer requires fully vaccinated persons entering the country to provide a negative COVID-19 test, while the United States has eliminated this requirement for all travellers.

At present, a number of restrictions are still in place in Caribbean countries, but the trend is towards the relaxation of pandemic-related measures. The Dominican Republic and Jamaica, for example, allow tourists to enter without COVID-19 testing, regardless of vaccination status; Barbados and Belize require testing for unvaccinated visitors only; some countries, such as the Bahamas and Trinidad and Tobago, require testing for entry irrespective of vaccination status; and a few, such as Saint Kitts and Nevis, do not allow entry to unvaccinated travellers. Small countries that depend on tourism, such as those in the Caribbean, have had to strike a balance between keeping their populations safe and stimulating the sector and, consequently, their

economies. While restrictions have helped limit the spread of the disease, their intensity may have driven some tourism away. To attract tourists back, it needs to be made easy for them to visit the country. Since May 2020, the United States Virgin Islands have performed better than the Caribbean ECLAC member States, recording monthly arrivals growth of more than 100% over 2019 in March 2021, rising to 162% in October of that year. Americans travelling to this United States territory do not need travel insurance, or a visa or passport. This ease of access could have made the United States Virgin Islands an easy substitute for United States citizens who have been seeking a vacation destination for the past two years, which would explain its strong performance.

The following paragraphs make a number of recommendations for the future of the tourism sector that could be useful for Caribbean economies striving to build back in a more resilient and sustainable way.

- **Crisis management.** Crisis management strategies must be improved to ensure that the tourism sector is better prepared to respond to future shocks. A risk-based approach is the best strategy for dealing with unpredictable events, such as pandemics.
- **Training for the future.** Countries should provide regular skill assessments for workers in the sector. Both workers and managers in small and medium-sized enterprises (SMEs) should have regular training and retraining opportunities, to enhance workforce flexibility in the event of future pandemics or crises. The more flexible a sector is, the greater its capacity to adapt to crises.
- **Health and safety measures.** Even if restrictions are relaxed, health and hygiene measures must be maintained to increase visitor safety and confidence without restricting their freedom. Nowadays, visitors expect stricter health measures.
- **Development of the use of digital technologies.** The pandemic has hastened the transition to digital technologies and online working. Tourism service providers must take advantage of these trends to improve their products. The number of travellers who combine teleworking with vacation and leisure with business travel was increasing even before the pandemic (WTTC, 2021b). Caribbean hotels must invest in connectivity infrastructure and online meeting capabilities to attract this type of hybrid tourist.
- **Development of niche markets.** The Caribbean should invest in diversification initiatives both within and outside the tourism sector. Tourism service providers will need to adapt their range of supply as travel patterns adjust. New niche markets should be explored, such as adventure, health and educational tourism.
- **Sustainability.** Any initiative to build back and develop the tourism sector must have sustainability at its core.

In response to the challenges facing the subregion, the ECLAC subregional headquarters for the Caribbean has launched a project titled “Building back better in tourism-dependent Caribbean economies post-COVID-19”. This aims to identify the main impacts of the pandemic on the tourism sector and support the development of practical strategies to assist countries in their post-pandemic reconstruction endeavours.

4. Towards a sustainable tourism

Considering the changing dynamics of demand, together with future opportunities and risks, the tourism sector must be rebuilt in a more inclusive, sustainable and resilient manner. It must invest more in health, safety and risk management; work to provide favourable and inclusive labour, business and socioeconomic conditions; understand the increasingly relevant role of environmental sustainability; and take advantage of digitalization (WEF, 2021). It is in this context that sustainable tourism is promoted, which is to say tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities” (UNEP/UNWTO, 2005, cited in UNWTO, 2013, p. 10). This entails informed participation by all key stakeholders, as well as strong political leadership to ensure broad participation and consensus-building. Based on these considerations, ECLAC proposes ten pillars for action as detailed in box IV.5

Box IV.5

Pillars for action to promote sustainable tourism

- Improvement of the quality of life of the destination's population.
- Protection of the destination's natural and cultural heritage.
- Experiences developed by sustainable and innovative enterprises, especially MSMEs and enterprises led by women, particularly Afrodescendent and indigenous women.
- Protection of workers' rights and well-being.
- Resilience to seasonality through the diversification of activities and markets.
- Creation of a unique experience that increases tourist satisfaction and minimizes their ecological footprint.
- Sustainable use of natural resources based on territorial planning.
- Recognition of the impact of climate change and disasters.
- Strengthening of governance and institutional capabilities.
- Creation, use and interoperability of databases.

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Adapting actions to the local context is crucial for the successful adoption and implementation of sustainable tourism. Strategies that promote sustainable tourism should not be stand-alone, but should be incorporated into annual national development plans and engage different stakeholders from all sectors, in particular the local communities directly affected. The changes will require continuous medium- and long-term investments to ensure that the tourism industry does not collapse in the wake of future natural and anthropogenic shocks.

Adopting sustainable tourism requires national efforts to improve tourism services in each country, and also cooperation between countries to ensure resilient responses to future crises. Experiences in coordinating activities and sharing good practices in disaster risk management are a sound basis for the creation of inter-country and inter-stakeholder coordination working groups, to develop joint guidelines and protocols to improve tourism resilience. Knowledge-sharing practices on tourism support measures could be developed and implemented. Bilateral or subregional agreements could also be developed and strengthened, to facilitate the transit of travellers from signatory countries and jointly explore innovative solutions to facilitate cross-border transportation. Measures could also be designed to safeguard public health and enable businesses spanning the tourism value chain, especially MSMEs, to operate and benefit from the dynamism of this industry. These endeavours could benefit greatly from participation by private actors, both national and international, as well as firms of varying sizes with different roles in the sector's value chains. Their participation could be particularly important in the widespread adoption and use of digital technologies in the different tourism subsectors and zones, as well as by their employees, whatever their contractual status and gender.

I. Harnessing the potential of MSMEs and the social and solidarity economy

The economies of Latin America and the Caribbean exhibit strong dualism between a dynamic, high-productivity sector projected towards international markets, and a large segment of economic activities of low productivity that operate with precarious forms of organization, few professional and technological resources, and limited access to credit. It is a production segment that employs a large proportion of the labour force and is composed mainly of micro and small enterprises, mostly informal, which interact weakly with the most dynamic, innovative and exporting sectors. It is a very heterogeneous segment in which needs and potentialities are mixed, ranging from subsistence enterprises operating in conditions of marginality and poverty to professionally managed companies that achieve wide margins of accumulation.

As these business segments are not distributed uniformly in geographic terms, this economic polarization has a clear territorial dimension. Some regions have a heavy concentration of productive and technological capacities, while in others low-productivity firms predominate.

To advance structural change in the region, it is therefore necessary to implement economic and social measures to improve the productive capacities of the low-productivity segments, and thus create conditions for them to integrate with the most dynamic and innovative sectors. The central pillars of this process are the development of the learning capacity of micro- and small enterprises, including the development of talent and its digital transformation, and the promotion and consolidation of their capacity to collaborate in collective actions that will enable them to achieve economies of scale and increase their bargaining power.

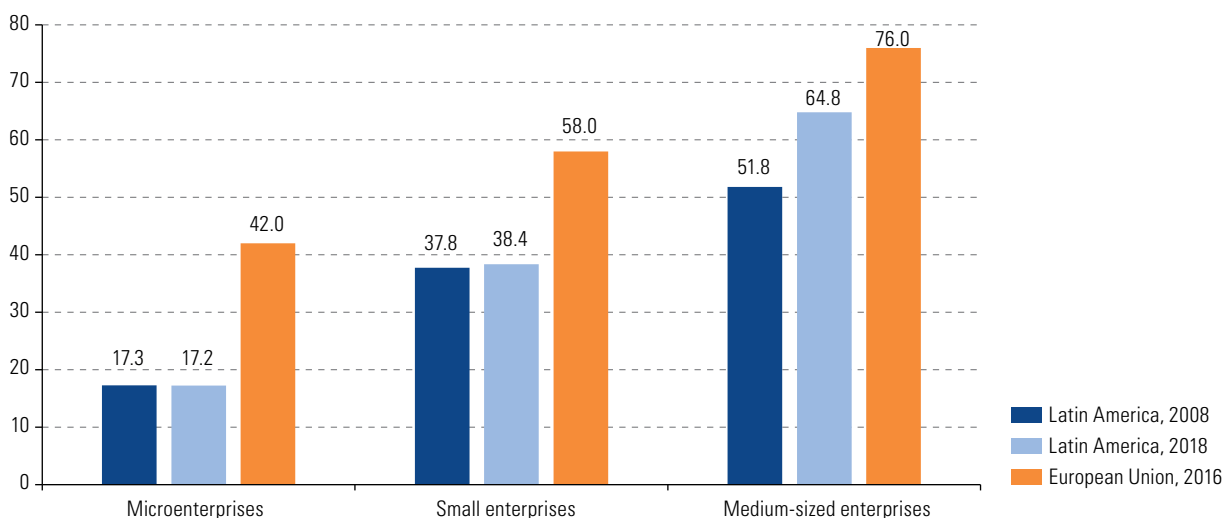
1. MSMEs: informality and productivity gaps

Micro-, small and medium-sized enterprises represent a substantial segment of the region's formal production structure. In 2018, MSMEs created 59.1% of formal employment,⁵⁴ of which 52% corresponded to microenterprises. These firms, which in many countries have no more than 10 employees or US\$ 100,000 in annual sales,⁵⁵ are responsible for more than 30% of jobs in the region, making them the second most important employers, after large firms, which account for more than 40% of total employment.

Labour productivity in MSMEs is greatly inferior to that of large firms. As shown in figure IV.35, medium-sized enterprises achieve only 65% of the labour productivity of large enterprises; small enterprises achieve 38%; and microenterprises, 17%. The figure also reveals two other important points: firstly, this relative productivity gap has not varied much over the last decade. In fact, if medium-sized enterprises are excluded, whose relative labour productivity has increased by 13 percentage points, the relative labour productivity of micro- and small enterprises has not changed significantly. Secondly, a comparison of these data with the reality of the European Union reveals an important difference. In Europe, there are also labour productivity gaps between large firms and MSMEs, but the size of the gap is much smaller than in Latin America. European microenterprises attain a labour productivity equivalent to 42% of that of large firms, while the equivalent figure for Latin American microenterprises is just 17%.

Figure IV.35

Latin America and European Union: labour productivity relative to large firms, by firm size, 2008, 2016 and 2018
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official statistics.

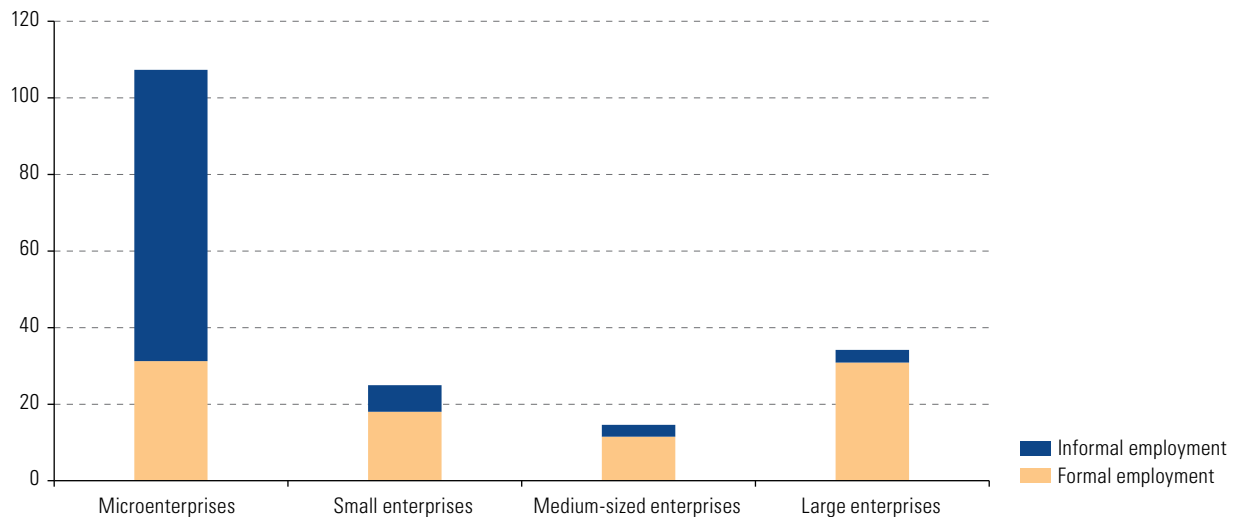
⁵⁴ These data, prepared by ECLAC on the basis of official statistics, refer to Argentina, Brazil, Chile and Mexico, which jointly account for 71% of the region's GDP. These countries also have information on formal enterprises by size, obtained from administrative records such as tax or social security records, or from business censuses (see Correa, Leiva and Stumpo, 2020).

⁵⁵ Latin America and Caribbean countries define MSMEs in various ways, differing both in the variables used for the definition (number of employees, sales, assets) and in the ranges established for the variables.

This scenario refers exclusively to formal enterprises. The informal economy, however, has a very large presence in Latin America and the Caribbean. On average, 50% of total employment in the region is informal. This segment of the population endures more precarious employment conditions and has lower labour incomes than those employed in formal enterprises. Although there are significant methodological difficulties in analysing the informal sector,⁵⁶ the available data make it possible to estimate the distribution of informal employment in the different business segments: a large proportion of informal employment is concentrated in microenterprises (see figure IV.36); and 70.9% of employment in microenterprises is informal (see figure IV.37).⁵⁷

Figure IV.36

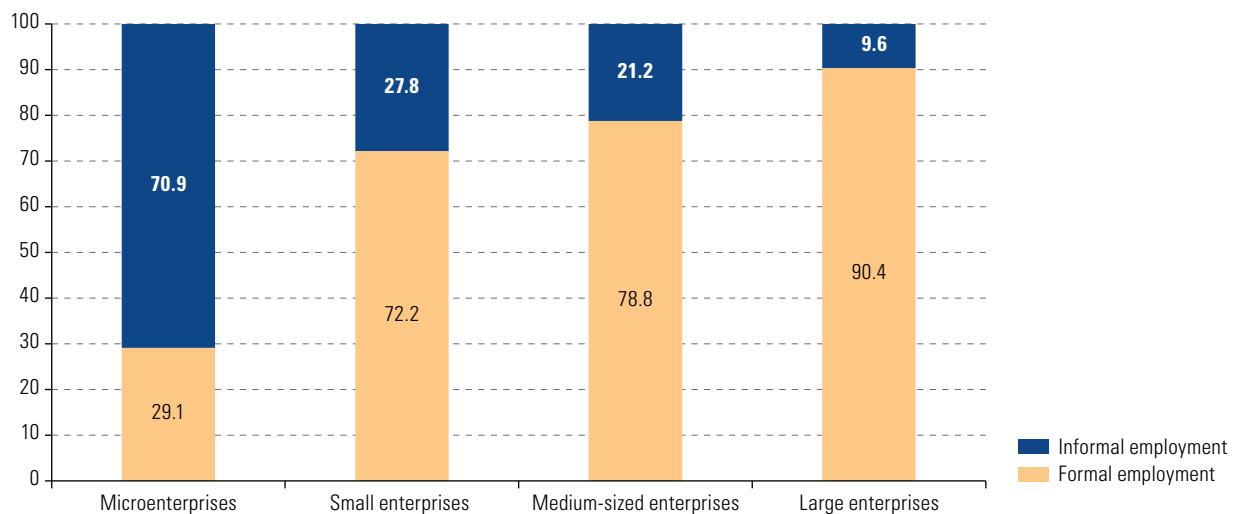
Latin America and the Caribbean: employment, by firm size and formality, 2020
(Millions of people)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Household Survey Data Bank (BADEHOG).

Figure IV.37

Latin America and the Caribbean: distribution of employment, by firm size and formality status, 2020
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Household Survey Data Bank (BADEHOG).

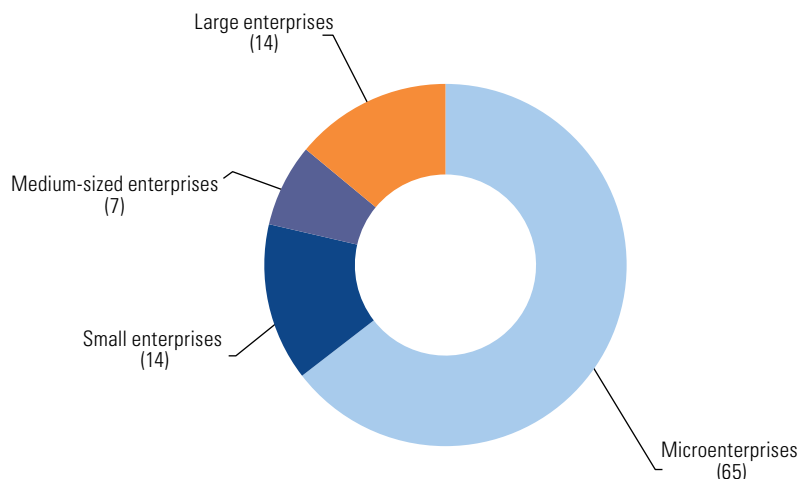
⁵⁶ In 1993, the fifteenth International Conference of Labour Statisticians (ICLS) adopted a resolution concerning statistics of employment in the informal sector, according to which “the informal sector may be broadly characterised as consisting of units engaged in the production of goods or services with the primary objective of generating employment and incomes to the persons concerned. These units typically operate at a low level of organisation, with little or no division between labour and capital as factors of production and on a small scale. Labour relations –where they exist– are based mostly on casual employment, kinship or personal and social relations rather than contractual arrangements with formal guarantees” (ILO, 2013).

⁵⁷ The microenterprise category generally includes production units that have between one and nine employees, including sole proprietorships and own-account or self-employed workers.

If the informal sector is considered, the importance of the smaller firms, particularly microenterprises, increases significantly to account for 65% of total employment (figure IV.38).

Figure IV.38

Latin America and the Caribbean: distribution of employment by firm size, 2020
(Percentages)

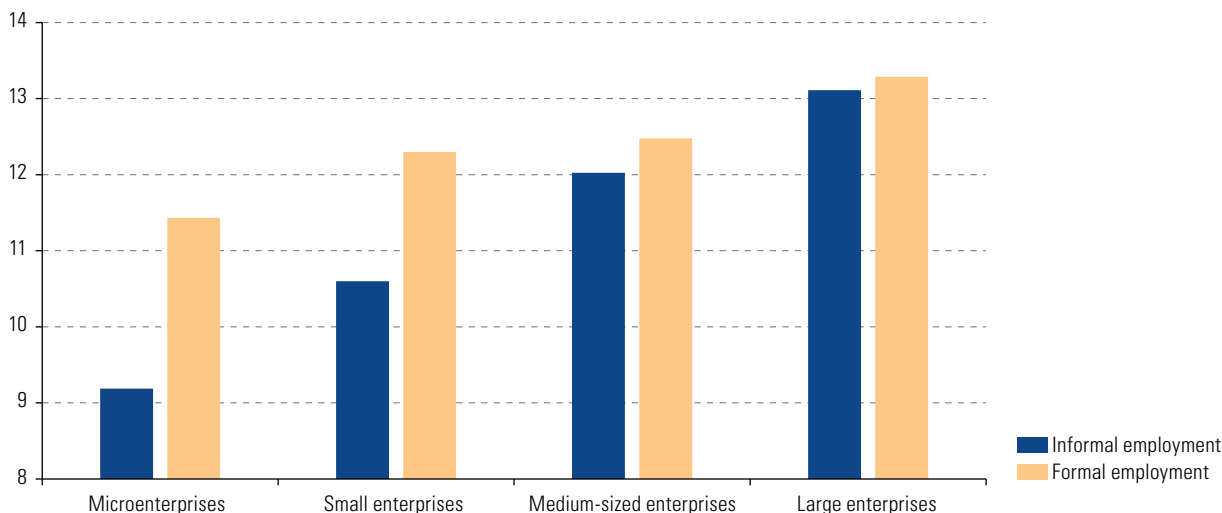


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Household Survey Data Bank (BADEHOG).

Although the productivity of this business segment cannot be estimated, it is possible to extract relevant information on income and schooling from household surveys. Firstly, employees in microenterprises have, on average, three years less schooling than their peers in large firms. Secondly, in microenterprises the schooling gap doubles in the case of informal employees: while the difference in schooling among formal employees in large firms is just over two years, in the case of informal employees this difference widens to four years (see figure IV.39). The lower level of schooling in informal enterprises implies less capacity to learn and adapt to changes in production and technology; and at a time of intense technological change, this poses major risks in terms of job retention and the reduction of inequalities. These risks intensify insofar as firms that fail to adapt to the pace of the ongoing transformations remain in business.

Figure IV.39

Latin America and the Caribbean: average schooling of persons employed in formal and informal sectors, by firm size, 2020
(Number of years)

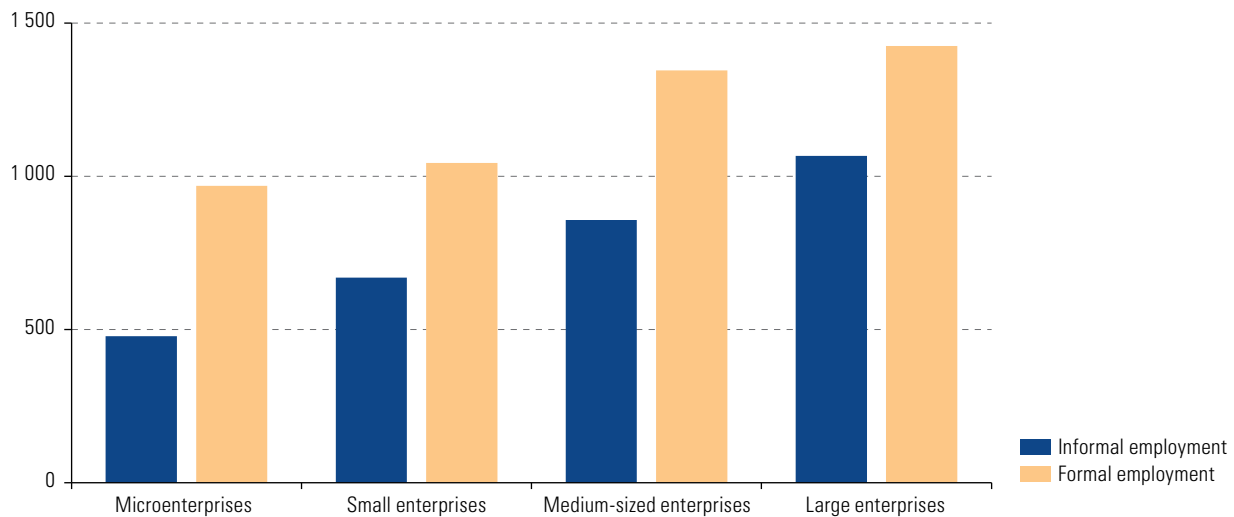


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Household Survey Data Bank (BADEHOG).

In terms of labour income, informal workers earn 44% less, on average, than their formal counterparts. In the case of microenterprises, the difference exceeds 50%. There are also marked differences when measuring income gaps between firm sizes: among formal employees, those working in microenterprises earn an income that represents 68% of the income of those in large firms, while the equivalent for informal workers is 45% (see figure IV.40).

Figure IV.40

Latin America and the Caribbean: average monthly labour income of persons employed in the formal and informal sectors, by firm size, 2020
(United States dollars in purchasing power parity)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Household Survey Data Bank (BADEHOG).

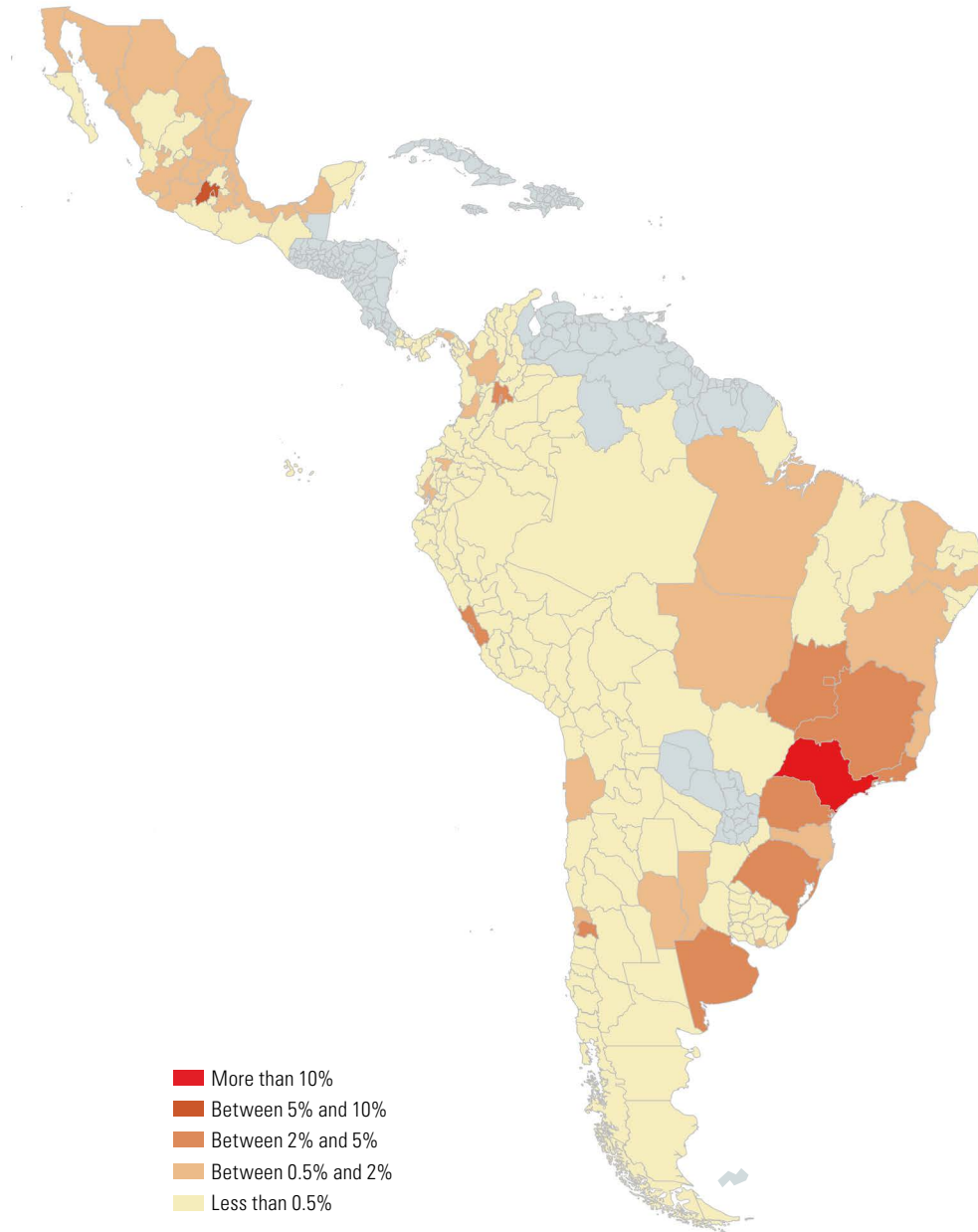
2. Concentration and geographic distribution of microenterprises

The duality described above, between production segments distinguished by large labour productivity differences, has a geographical counterpart. Subnational economic territories have become highly concentrated, in a process that was imposed during the import substitution industrialization development strategies of the 1950s. This generated an intense process of urbanization which, in conjunction with sustained migratory flows from the countryside to the city, resulted in the expansion of the region's metropolises.

The patterns of spatial organization that emerged during this process generated increasing disparities in possibilities for economic development and general living conditions between territories. This replicated, within countries, the centre-periphery model detected by ECLAC in international trade, and heavily unbalanced patterns of spatial organization formed within Latin American countries. For example, the state of São Paulo, which alone generates 10% of the region's GDP, together with Mexico City and Mexico State, the Autonomous City of Buenos Aires and the Province of Buenos Aires, and the states of Rio de Janeiro and Minas Gerais, jointly account for nearly a third of the region's GDP (see map IV.1 for further details).

Map IV.1

Latin America and the Caribbean (9 countries): relative share of current GDP generated by each intermediate territorial entity relative to the region's total GDP, 2020



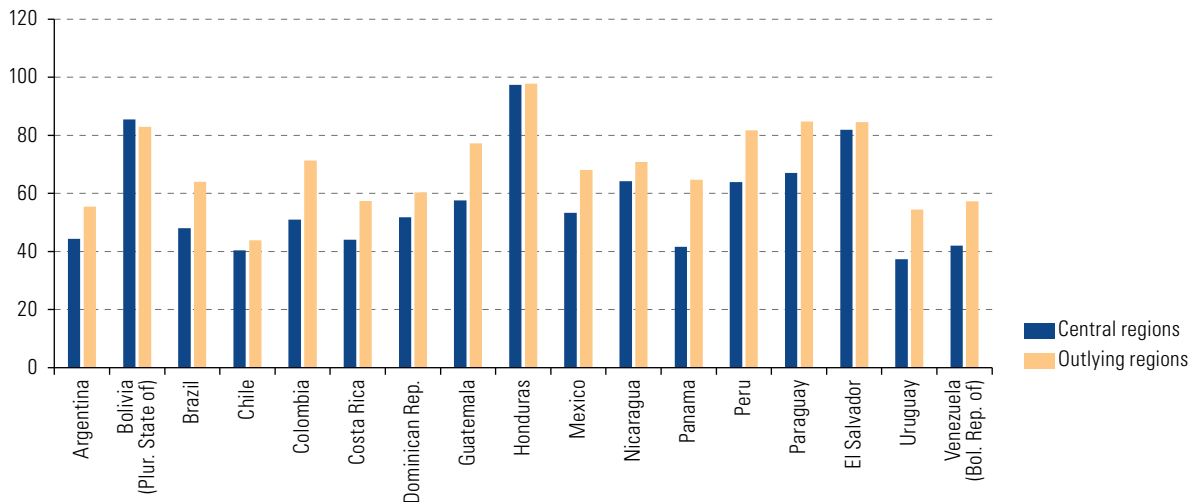
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official information from the countries.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

One aspect of this asymmetrical distribution of production capacities is the geographic pattern of the presence of microenterprises, which are much more prevalent in the outlying (non-capital) regions. The share of employment generated by microenterprises in these regions is, on average, 12.1 points higher than in the central regions (see figure IV.41). The rate of informality in microenterprises indicates that informality is more prevalent in the non-central, or peripheral, regions of Latin America and the Caribbean.

Figure IV.41

Latin America and the Caribbean: microenterprise share of employment, by type of region, 2020 or latest available year (Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official statistics.

3. Social and solidarity economy

One of the growing sectors that can respond to the challenges currently being faced by both smaller enterprises and informal employment, is the social and solidarity economy. This sector encompasses organizations such as cooperatives, associations, mutual institutions, foundations, social enterprises, self-help groups and other entities that operate according to these values and principles.⁵⁸

In Latin America and the Caribbean, there are various laws that define a social or solidarity-based sector of the economy. Mexico has the Law of the Social and Solidarity Economy (2012); Uruguay has the Law of Social and Solidarity Economy (2019); and Ecuador has the Organic Law of Popular and Solidarity Economy of the Financial System (2011). Similar regulations also exist in other countries, such as Colombia (1998) and Costa Rica (2015). A common feature of these laws is the presence of cooperative enterprises as organizing pillars of the sector, in which the cooperative subsector is one of the most organized components of the social and solidarity economy.

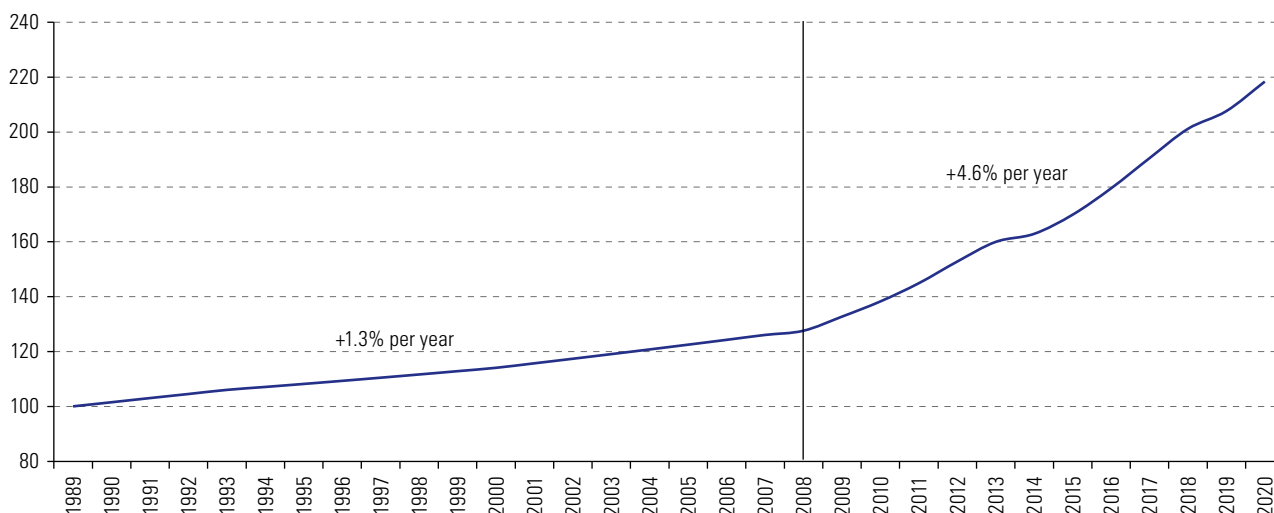
Cooperatives have achieved promising results in the last ten years, especially considering their remarkable growth and incorporation into production policies. The average annual growth in the number of cooperatives in Latin America accelerated in the post-2008 period after, from 1.3% between 1989 and 2008 to 4.6% between 2008 and 2020 (see figure IV.42).

⁵⁸ The International Labour Organization defines the social and solidarity economy as “enterprises, organizations and other entities that are engaged in economic, social, and environmental activities to serve the collective and/or general interest, which are based on the principles of voluntary cooperation and mutual aid, democratic and/or participatory governance, autonomy and independence, and the primacy of people and social purpose over capital in the distribution and use of surpluses and/or profits” (ILO, 2022).

Figure IV.42

Latin America: presence of cooperatives, 1989–2020

(Base year 1989=100)



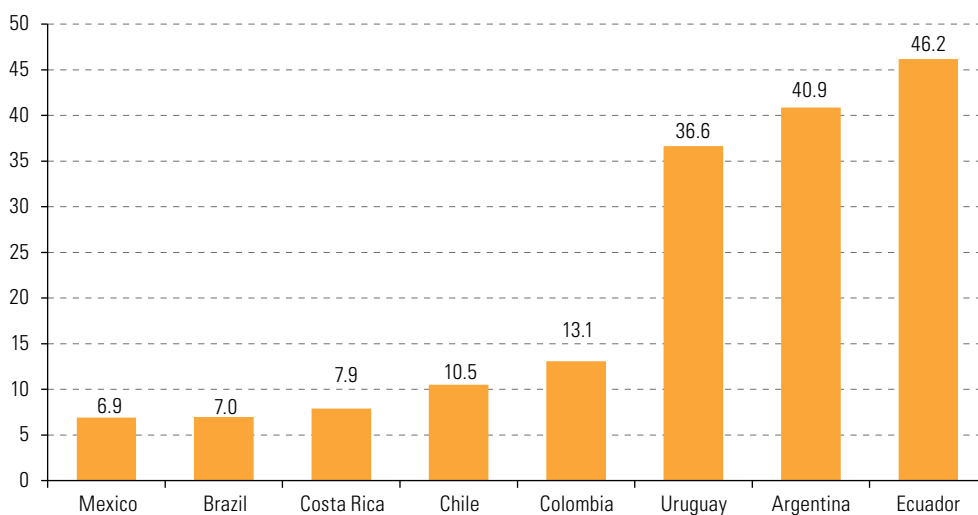
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of F. Correa "Instituciones y políticas públicas para el desarrollo cooperativo en América Latina", *Project Documents* (LC/TS.2021/203/Rev.1), Santiago, ECLAC, 2022.

The participation of cooperative enterprises in the region's production structure also displays territorial differences, such as the percentage of the population affiliated to a cooperative. In Argentina, Ecuador and Uruguay, more than a third of the population belongs to a cooperative, compared to around 10% in Brazil, Chile, Colombia, Costa Rica and Mexico (see figure IV.43). These cross-country differences in the importance of cooperatives are also replicated at the subnational level: the number of cooperatives and their members are greatest in highly agricultural states, departments or subnational regions (Jácome Estrella, 2022; Martí, 2022; Radrigán Rubio, 2022; Rojas Herrera, 2022).

Figure IV.43

Latin America (8 countries): population affiliated to cooperatives, 2020 or latest available year

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of F. Correa "Instituciones y políticas públicas para el desarrollo cooperativo en América Latina", *Project Documents* (LC/TS.2021/203/Rev.1), Santiago, ECLAC, 2022.

In the last decade, cooperatives have been used as a model for social inclusion and labour formalization. Social cooperatives have influenced this greatly. With support from public programmes, they have been engaged in organizing collective work in low-income social segments, which has enabled previously informal workers to gain access to the social security system. In Argentina, through the Ingreso Social con Trabajo programme (PRIST), the social assistance policy was complemented with employability support measures, starting in 2011. This led to the creation of a large number of cooperatives working in activities indicated by local governments. In Uruguay, social cooperatives have had a specific legal status since 2006, and are one of the types of cooperatives that have grown most rapidly between 2008 and 2020, along with worker and housing cooperatives.⁵⁹

In Latin America, 97.2% of all cooperatives are MSMEs: 71.4% are microenterprises; 19.3% are small enterprises; 6.5% are medium-sized enterprises; and 2.8% are large firms (Correa, Leiva and Stumpo, 2020). As a result, this subsector of the social and solidarity economy being included in policies and programmes aimed at strengthening smaller enterprises, which has put an end to their historical exclusion from funds and programmes targeted on MSMEs. In Colombia, production organizations of the solidarity economy (including cooperatives) have been included as potential beneficiaries of Law No. 2069 of 2020, on the Promotion of Entrepreneurship; in Argentina, cooperatives are recognized as MSMEs, so they can apply to all public policy programmes and instruments available to the Ministry of Productive Development; and, in Chile, some public agencies include cooperatives as potential beneficiaries in their programmes' bidding rules.

4. Policies for productivity and inclusion

A structural change policy aimed at enhancing the inclusion of the most disadvantaged population groups must create the conditions to increase integration between the most and least developed and fast-growing entities and territories in the region.

The informal economy, MSMEs and the fastest-growing sectors require different support measures and instruments; but the lines of action adopted in the three areas must reflect a shared rationale and form part of the same strategy aimed at promoting a more inclusive and sustainable development model.

Actions to support the most disadvantaged sectors must pay special attention to informality, which, as noted above, is related to the education level and income of the population involved in the respective activities. Traditional policies for production development or assistance to marginal groups have been ineffective, since they are targeted on formal enterprises and exclude informal ones. Programmes that do include them, since they are not dealing with legally recognized firms, are targeted on the natural persons who carry out the production activity in question. In these cases, the focus often tends to shift to welfare issues, such as health, food, housing safety, or the promotion of subsistence economic activities that do not have a significant impact on capacity-building, the incorporation of new technologies and the improvement of processes, or the exploration of new markets.

In contrast, the main objective of development policies targeting the informal sector should be to boost productivity through a combination of social measures to support individuals, especially population groups that are marginalized and poor, and actions that enhance both their knowledge and learning capabilities and the generation of collective initiatives and social capital. The design of a policy aimed at the inclusion of informal enterprises, mainly microenterprises, should consider issues such as the following:

- Granularity and direct contacts with potential beneficiaries are essential. Informality is beyond the scope of most controls and records, by definition, and is characterized by a lack of reliable statistical data. Knowledge of the local reality therefore has to be acquired using methodologies that prioritize a direct approach between the entity managing the policy and the potential beneficiaries. This is often not possible when policies are designed and managed in a centralized manner.

⁵⁹ Between 2008 and 2020, the number of social cooperatives increased by 248%, worker cooperatives grew by 256% and housing cooperatives by 274%, while the number of agricultural cooperatives increased by 51%, savings and credit cooperatives by 32% and consumer cooperatives by 33% (Martí, 2022).

- The modalities of access to support programmes should include dialogue mechanisms based on direct interaction between policy implementers and their beneficiaries, rather than on formal protocols and written communications.
- Given the size of the informal sector, policies must guarantee the mass-scale application of the measures. This is the only way to generate a perceptible effect and correct some of the gaps affecting this segment.
- It follows from the above that the measures implemented must be simple and result in very low unit management costs.
- To support less developed enterprises, close collaboration is needed to implement a range of policies that address a wide variety of issues, especially those concerning the quality of life of the target population (health, food and safety and security, among others).

Based on these considerations, the following criteria are proposed to guide the design of production policies aimed at stimulating the inclusion of microenterprises, especially informal ones.

(a) Informality and productivity

The performance of microenterprises is improved by exposing them in a controlled way to the stimuli and pressures that are experienced by larger firms in two key areas: technology (and, in general, the processes of developing and incorporating new knowledge) and the market. The main purpose of the support policy is to minimize the disadvantages they experience owing to their size, which requires the following:

- Facilitating access to key inputs, especially credit, by eliminating the restrictions that operate in the traditional financial market. These relate mainly to the presentation to credit agencies of formal documentation on income and assets (which, by definition, informal enterprises cannot provide) and on the collateral that these agencies require. The application of digital technologies to credit policy management opens up possibilities in this regard, since it allows specialized agencies to assess risks based on the behaviour of individuals, rather than on the documented operating earnings of the enterprise in question.
- Facilitating access to production assets in two domains: the organization of popular fairs and local markets, for example, for artisans and family farming, and the construction of productive assets for processing inputs; for example, for the production of agro-industrial products on a family scale, or for the preservation and processing of fish or molluscs.
- Generating learning processes that adopt methodologies based on the recognition and exchange of experiences, unlocking their value; developing demonstration plots or workshops and creating technical centres that play a role in raising awareness, technological literacy and support for groups of enterprises.

An essential condition for microenterprises to be able to develop, and for support measures to have the expected impact, is that they act collectively, forming networks or clusters to share costs, exploit economies of scale and increase their bargaining power with both customers and suppliers.

(b) Social and solidarity economy

The main actions needed to strengthen the social and solidarity economy are: firstly, its recognition in countries where there is still no legislation on the subject; and, secondly, the creation or consolidation of a specialized institutional framework to support the enterprises that comprise the sector. In some of the region's countries there is no legal recognition of the sector as such. This hinders policies aimed at productivity growth, income generation, employment and the formalization of a distinct type of work. The nature of production in the social and solidarity economy places the objectives of well-being, sustainability, participation and collaboration above the profit-seeking of conventional enterprises. This alternative ethos imprinted on the productive enterprise process can help the region's economies move towards a new development model. Legal recognition of the sector and the provision of adequate human and financial resources for its public institutions are a public policy priority in countries where progress has not yet been made in these areas.

In the most successful cases, policies targeted at the social and solidarity economy imply the existence of a consolidated public institutional framework with its own human and financial capacities. This is generally called the Institute of Social and Solidarity Economy and is attached to the Ministry of Production, Labour or Social Development (depending on the country and the orientation of the policy aimed at the social and solidarity economy). Nonetheless, it maintains a greater degree of autonomy than most public agencies that promote production or social development. This greater autonomy is generally reflected in the existence of a board of directors or steering committee of the institute in question, appointed by the public sector and by the social and solidarity economy sector, organized at the national level. In Argentina, Ecuador and Uruguay, these institutes have consolidated their position, with staffing that can amount to several hundred professionals and commensurate budgets (Correa, 2022).

The action of these institutes is increasingly oriented towards serving as a bridge between public agencies and the sector's trade associations, and between levels of government, with the aim of strengthening and increasing the participation of social and solidarity economy enterprises and organizations. By serving as a bridge, these institutes approach public agencies attached to the various ministries, to request inclusion of the sector's enterprises and organizations among the potential beneficiaries of their plans and programmes. This is generally done by altering the regulatory bases of the programmes to broaden their scope to include the enterprises and non-profit productive organizations that make up the social and solidarity economy. On other occasions, it has been necessary to amend legislation and regulations that prevent the sector from accessing tax and fiscal benefits that are available to conventional enterprises.

The coordination actions of these institutes, or of the public departments responsible for strengthening the sector, are also increasingly aimed at strengthening the link with subnational, mainly intermediate, governments at the state, departmental, provincial or regional levels. This level of government generally has special funds and resources of its own to stimulate economic activity. When there is effective multilevel coordination around the social and solidarity economy, projects with territorial specifics are financed through these subnationally invested funds. Intermediate governments have also opened social and solidarity economy departments and offices within their organizational structures, with staff assigned exclusively to formulating and implementing policies for the social and solidarity economy (Martí, 2022).

(c) The institutional framework of support and multilevel coordination

In order to integrate the segments of the economy with slower growth, policy needs to be implemented through the convergent action of public support institutions operating at the three levels of government: national, regional and local. There needs to be dialogue and consistent action between these levels, which raises the need for multilevel coordination of public policies and production development strategies.

Local governments (municipal, district, cantonal and communal) are the most appropriate entities to implement support for microenterprises because they are level of government closest to the population. As a result, they are best able to understand territorial differences and guarantee a level of action that makes it possible to reach informal enterprises (especially microenterprises), correctly interpreting their interests and needs, and promoting appropriate and relevant support actions that are consistent with local idiosyncrasies, preferences and cultures.

The weaknesses that, with few exceptions, are experienced by local governments in Latin America and the Caribbean can be addressed through the actions of the regional government itself (provincial, departmental or state). In particular, local government associations can be formed that make it possible to generate economies of scale to create specialized and permanent professional structures, and to address challenges that are more than local (ECLAC, 2015).

In Chile, for example, many local governments play an important role in training actions, providing production services, promoting social and solidarity economy organizations, nurturing employment and entrepreneurship, reducing informality, and coordinating local mechanisms of public-private collaboration (Correa, 2018; Correa and Dini, 2019). The action of local and subnational governments in general (including regional or intermediate governments) makes it possible to tailor productive policies to the development needs of the locality or region in question, considering that the factors that drive productivity in rural and small-population territories are different from those of urban and large-population territories (Correa and Miranda, 2021).

Regional governments play a key role in defining the strategic framework within which local-municipal action is promoted, by strengthening the capacities of local governments and generating collective actions among municipalities. This aims to facilitate the dissemination of good practices and promote economies of scale that make it possible to undertake larger-scale actions to address common problems. As part of its regional production development strategy, this government body must facilitate coordination of the institutions operating in its territory, to generate a convergence of actions and resources, especially in terms of connection and transportation infrastructure and social policies to support marginal areas.

Lastly, the national entities supporting production development are responsible for developing cross-cutting policies to reduce the problems faced by microenterprises in terms of legislation and regulatory issues for formalization, the creation of ad hoc tax regimes, and access to credit and guarantees.

J. Conclusions: towards industrial policies with sectoral and cross-cutting actions

The review of the nine drivers of sustainable and inclusive development shows that many of them have characteristics that allow them to be considered sectors or areas of activity that display elements of Keynesian or Schumpeterian efficiency, both of which are analysed in chapter II. The dynamism of global demand can be discerned in sectors such as green hydrogen-based energies, lithium battery production, electric buses and cars, services based on digital technologies (mainly data management), biofertilizers or advanced pharmaceuticals. In addition, owing to the technological revolutions that are currently under way, these sectors also have technological intensities in terms of production and foreign trade that would allow them to be classified among sectors displaying Schumpeterian efficiency.

Moreover, some sectors, such as the automotive industry, which, in Pavitt's typology (also analysed in chapter II), displayed scale-intensive characteristics nowadays are actually science-based if technological advances are taken into account, although scale is still important. Examples include electromobility and batteries. Of the sectors or areas analysed, six are currently science-based (renewable and clean energies, electromobility, circular economy, digital technologies, bioeconomy and pharmaceuticals).

Three areas would, at first glance, remain outside these "desirable" efficiencies: the care economy and tourism, which are almost entirely based on personal services; and MSMEs and the social and solidarity economy. Nonetheless, their role in development is important, because they can offer broader solutions than the other sectors to the problems of unemployment and informal employment, the seriousness of which was analysed in chapter III. Provided that they are formalized and adequately valued, their contribution to value and job creation for equality will increase.

In both types of sectors —those of Keynesian or Schumpeterian efficiency and those of high job creation capacity— the countries of Latin America and the Caribbean have capacities with different degrees of development, as noted in this chapter. All of them have elements which, if driven by properly implemented industrial policies, can provide a basis for expansion, such as the pharmaceutical industry during the pandemic or the incipient production and supply of electric vehicles.

In many activities in the sectors analysed, the scale of the region's national economies can be a major constraint, since it restricts the magnitude, or even the viability, of the efforts that can be deployed in terms of technological research and development and innovation. Hence, once again, the importance of sectors that are "efficient" in job creation, which display their full potential quite independently of the scale of the economies.

The positive view of the potential of the sectors analysed in this chapter is a central element in the design of industrial policies in the region; but it is not the only one, since industrial policy also has cross-cutting dimensions. The combination of sectoral and cross-cutting visions is precisely what characterizes the effective industrial and technology policy strategies proposed in the next chapter.

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CHAPTER

V

Policies to transform the development model

- A. A big push for sustainability
- B. Development planning for policy coordination
- C. Macroeconomic policies to accelerate growth and address inflation
- D. Consolidating welfare states for a sustainable future
- E. Care systems: a pillar of rights-based welfare states
- F. Mitigation and adaptation to the environmental emergency
- G. New approaches to natural resource governance
- H. Implementing industrial and technological policies
- I. Regional integration in the new geopolitics of globalization
- J. Conclusions: the path forward

Bibliography

A. A big push for sustainability

With situations of crisis and uncertainty in economies and societies around the world, developed countries are undertaking large-scale investment, the goal of which is to drive economic growth by creating enabling conditions for a transition to a more sustainable future. As outlined in chapter I, the aim is thus to move toward a new paradigm in which ever greater importance is attached to regional strategies, policies and measures.

In this context, the countries of Latin America and the Caribbean face difficulties not only in responding to a succession of crises but also in coordinating measures to accelerate growth while promoting creation of high-quality formal jobs and fostering sustainability. As highlighted in chapters II and III, there are still some obstacles in the region to significant progress in diversifying economies, creating decent jobs and reducing poverty and inequality. Also, despite the progress made in the sectors analysed in chapter IV, the region continues to lag behind in the pursuit and assimilation of new technologies and the implementation of new processes and products.

The structural challenges of a transition to a fast-growing, inclusive and sustainable economy cannot be overcome spontaneously or automatically. Overcoming these obstacles entails acknowledging their existence and acting accordingly when formulating and implementing new development strategies. This is why the Economic Commission for Latin America and the Caribbean (ECLAC) (2016a, 2018a and 2020a) has proposed that the region should substantially boost investment in economic, social and environmental sustainability, because, despite current problems, there are opportunities for a new generation of policies that will bring about a new development cycle.

To move toward this goal, this section quantifies and analyses the aggregate impact of pursuing a big push for sustainability in the countries of the region, based on structural changes in investment and the policies that drive investment in the strategic areas or sectors identified in chapter IV. The impacts are estimated through a two-scenario simulation for the 2022–2030 period. The first is a baseline scenario, in which there are no changes in internal and external policies to promote sustainable development and historical trends are maintained, but the shocks caused by the COVID-19 pandemic are taken into account. The second scenario includes policies, incentives and regulations to foster sustainability-oriented investment in strategic areas. These are two diametrically opposed cases for illustrative purposes, but the actual situation may be a combination of both, depending on how the political economy is configured.¹

The baseline scenario describes a path of development that reproduces historical social, economic and environmental gaps. The scenario is based on existing trends and policies up to 2020² and, in assuming that there will be no policy changes, supposes that countries maintain their development patterns. The impacts of the COVID-19 pandemic are also incorporated into the baseline scenario, including contraction in various sectors of economic activity—such as consumption, investment and trade—and the resulting effects on society (on employment, for example), energy consumption and GHG emissions.³

In the baseline scenario, there are no incentives for the countries of the region to transform their development patterns and the effects of the pandemic incur significant socioeconomic costs, widening pre-existing economic and social gaps. While the environmental gap was temporarily narrowed by the pandemic crisis (in 2020, the slowdown in growth saw GHG emissions in the region decline by 2.4% relative to 2019), the economic recovery—all other things being equal—will cause emissions to return to their previous unsustainable path.

¹ The scenarios were formulated using the Cambridge Econometrics E3ME model. E3ME is a hybrid macroeconomic non-equilibrium simulation model of global environmental, energy and economic systems that can be used to derive estimates of different policies' impacts on these three systems. Although there is an explicit treatment for nominal variables (wages, costs and prices), the core of the E3ME model is based on dynamics of the real economy, so there is no explicit representation of the financial sector, including external financing. Version 3.2 of the model, developed in 2019, was used. Its theoretical approach is a pluralistic one (Scricciu, 2011), as it integrates contributions from various disciplines (such as climate science, engineering, history and ethics) and various academic traditions within the field of economics (for example post-Keynesian economics, structuralism, evolutionary economics and institutional economics) (Barker and others, 2012; Barker, 2008; Barker and Scricciu, 2010; Scricciu, Barker and Ackerman, 2013). The E3ME model is the intellectual property of Cambridge Econometrics.

² This is the most recent year with up-to-date information available (observed historical data), including policies announced through to that point. The recovery in 2021 (and in the other years analysed) is simulated, but the path is faithful to what happened in Latin American and Caribbean economies.

³ Uncertainty about the effects of the war in Ukraine, even in the medium term, precludes its inclusion in this analysis.

In the scenario in which sustainable development policies are adopted, there is an increase in public investment and regulation in areas that are strategic for a transformative recovery with sustainability and equality. These areas are: (i) transformation of the energy matrix based on renewable energies; (ii) sustainable mobility (focusing on e-mobility);⁴ (iii) the bioeconomy (sustainability based on biological resources and natural ecosystems); (iv) investments in digital transformation; (v) the health-care manufacturing industry; (vi) the circular economy (including recycling); and (vii) the care economy.⁵

The strategic nature of these areas lies in their potential to transform the pattern of development, because they can increase the competitiveness of the economy of the future within the scope of the ongoing technological paradigm shift or are related to environmental and health protection. These areas complement and reinforce each other, creating virtuous circles of development. For example, bioenergy investments in the transport sector contribute simultaneously to sustainable mobility, the energy transition, the bioeconomy and the circular economy.

Table V.1 presents the main objectives in each of these areas, the modelling strategy and the policies applied to a group of countries and territories in Latin America and the Caribbean.⁶ It is a set of policies that includes industrial policy instruments, such as subsidies and tax incentives for sustainable investments, regulations and direct public expenditures and investments.

Table V.1

Latin America and the Caribbean: objectives, instruments and modelling of the scenario in which sustainable development policies are implemented in the countries and territories of the region

Strategic area	Objectives	Modelling strategy and instruments
Sustainable energy transition	Increase electricity generation capacity through non-conventional renewable energy sources. <i>The transition in the electricity sector is combined with an energy transition in the transportation sector (sustainable mobility area). Bioenergy is included in the bioeconomy area.</i>	Investments are simulated that are capable of quadrupling the generation capacity of non-conventional renewable energies (wind, solar, geothermal, biomass and biogas) from 2020 to 2030. This acceleration in investment would be proportional to the global average increase seen over the previous decade (Frankfurt School/UNEP Collaborating Centre for Climate and Sustainable Energy Finance/BNEF, 2019). It also simulates a growing role for hydrogen in Latin American economies, through a progressive increase to a 1% share of fuel cells in the countries' electricity generation capacity by 2030.
Sustainable mobility	Progressively increase the use of electric and hybrid vehicles instead of internal combustion engine vehicles. <i>The move toward e-mobility is combined with promotion of biofuels, such as ethanol and biodiesel.</i>	Hybrid and electric vehicle price subsidies are simulated, equivalent to 30% for mass market hybrid and electric vehicles (HEV), 20% for mid-sized hybrid and electric vehicles, and 10% for luxury hybrid and electric vehicles. At the same time, prices of internal combustion engine vehicles (ICEVs) are increased through taxes equivalent to 10% for mass market ICEVs, 20% for medium-sized ICEVs and 30% for luxury ICEVs. Finally, ICEV phase-out regulation is simulated, which could consist of a mandatory gradual increase in the share of electric and hybrid vehicles in sales, so that they progressively replace vehicles powered by gasoline, diesel and natural gas.
The bioeconomy	Expand use of biofuels in the transportation sector. <i>This would be complemented by the increase in e-mobility and electricity generation from bioenergy (biomass, biogas) described in the energy transition area.</i> Promote recovery of natural capital through the restoration of degraded areas.	A progressive increase is simulated in the proportion of biofuels until reaching convergence with the mandatory blend required in Brazil (27.5%). According to ECLAC (2020), the trend of increases in this mix in Brazil will continue. For the simulation, investments in reforestation of 30 million degraded hectares in Latin America and the Caribbean have been assumed, corresponding to 10% of the total degraded area in the region (Vergara and others, 2016).
Digital transformation	Increase investment in key sectors for digital transformation.	Increased investment in the electronics, computer services (for example, hardware) and communications sectors is simulated, doubling investment in 2030 relative to the 2020 level.

⁴ In the modelling, sustainable mobility includes, in addition to e-mobility, the use of biofuels such as ethanol and biodiesel, as well as fuel cells (for example, vehicles running on green hydrogen).

⁵ The other two strategic sectors identified in chapter IV are implicitly included. Sustainable tourism is captured indirectly through sustainable investments in the other sectors and MSMEs are implicitly included in the econometric parameters of the model.

⁶ Argentina, Brazil, Colombia and Mexico are represented explicitly as individual countries in the model. In addition, an aggregate representation of selected countries is included, comprising: Bolivarian Republic of Venezuela, Chile, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Nicaragua, Panama, Paraguay, Peru, Plurinational State of Bolivia, Puerto Rico, Suriname, Trinidad and Tobago, and Uruguay.

Strategic area	Objectives	Modelling strategy and instruments
The health-care manufacturing industry	Make additional investments in the pharmaceutical industry. <i>Public spending on health care, including vaccines, is also assumed to increase, as described below in the area of the care economy.</i>	A doubling of investment in the pharmaceutical industry by 2030 compared to 2020 is simulated.
The circular economy	Promote better use of materials in the economy. <i>Progress is also assumed to be made toward a circular economy by promoting replacement of fossil fuels with renewables (energy transition and bioeconomy).</i>	A doubling of investments in recycling by 2030 from 2020 levels is simulated.
Care economy	Expand public spending in areas that are key to implementing comprehensive care systems.	Public spending on health and education is assumed to double by 2030 from 2020 levels.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Frankfurt School-UNEP Collaborating Centre for Climate and Sustainable Energy Finance/BloombergNEF (BNEF), *Global Trends in Renewable Energy Investment 2019*, United Nations Environment Programme (UNEP), 2019; ECLAC, *Building a New Future: Transformative Recovery with Equality and Sustainability* (LC/SES.38/3-P/Rev.1), Santiago, 2020; and W. Vergara and others, *The Economic Case for Landscape Restoration in Latin America*, World Resources Institute (WRI), 2016.

Note: The text in blue corresponds to links between the different areas or sectors.

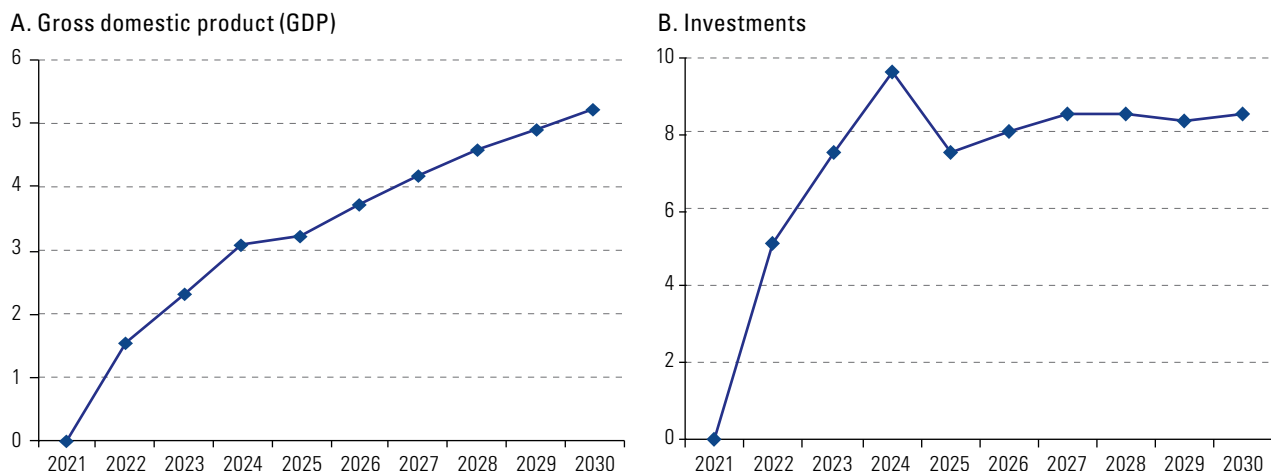
The simulation of macroeconomic effects and GHG emissions assumes that the changes will be implemented from 2022 onward. The results are presented as differences with respect to the baseline scenario. These results are merely illustrative, since the combinations of instruments can be very varied, and there are significant differences across countries. Although the policies presented in table V.1 are a proxy for the recommendations in chapter IV, their inclusion in the exercise provides important insight into the direction and magnitude of the quantitative effects of sustainable development policies.

The conclusion that emerges from these exercises is that the scenario in which sustainable development policies are implemented could bring about significant transformations that combine job creation with more environmentally sustainable growth. The exercises also show that social policies and policies to boost international competitiveness are key complements to domestic productive transformation initiatives to achieve sustainable development in its three dimensions. Given the heterogeneity of the region, the simulations should be considered approximate indications of the direction of the effects, the magnitude of which may vary significantly depending on the structural characteristics of each country.

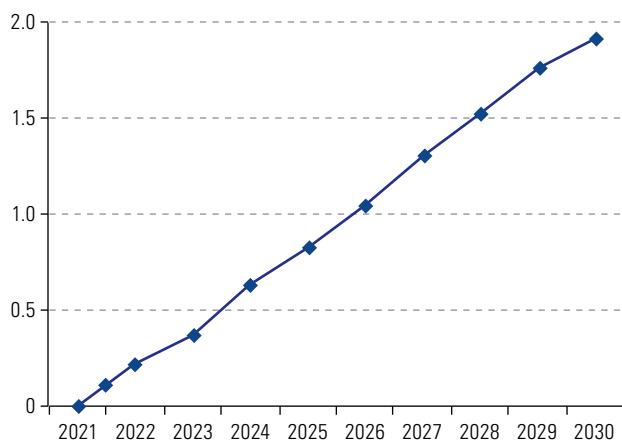
The effects of the scenario in which sustainable development policies are adopted (always relative to the baseline scenario) are addressed by simultaneously considering indicators of the three dimensions of sustainability: growth, inclusion and environmental preservation (see figure V.1).

Figure V.1

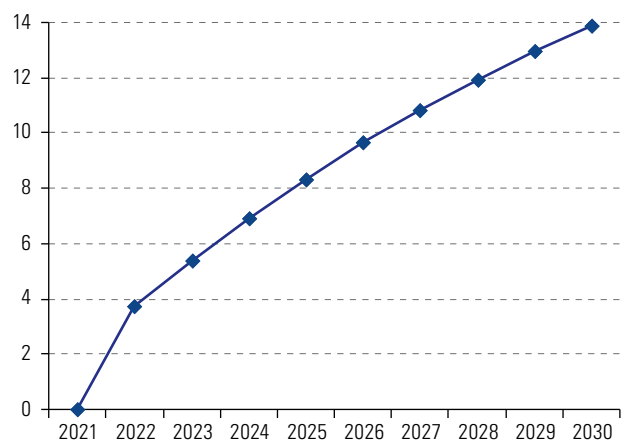
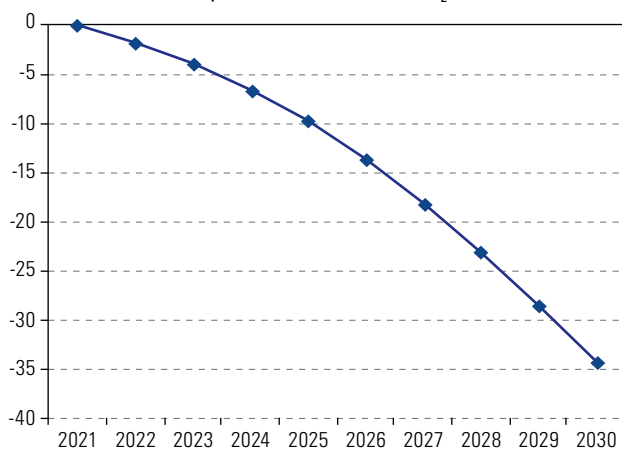
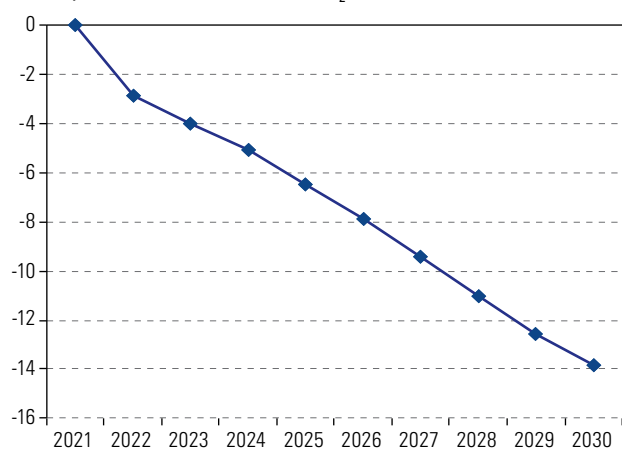
Latin America and the Caribbean: macroeconomic, social and environmental effects of the implementation of sustainable development policies in the countries of the region, change from baseline scenario, 2021–2030 (Percentages)



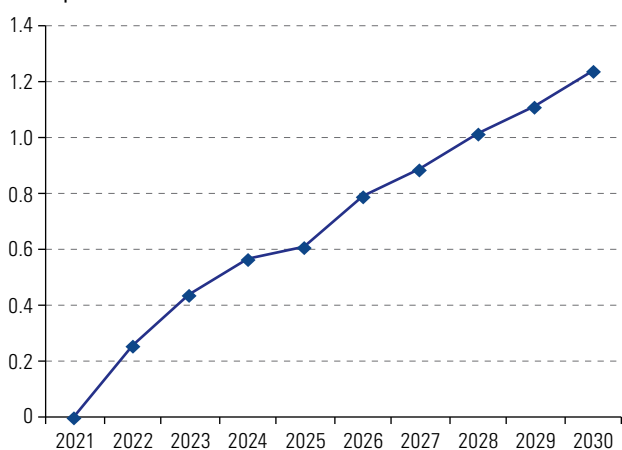
C. Consumption



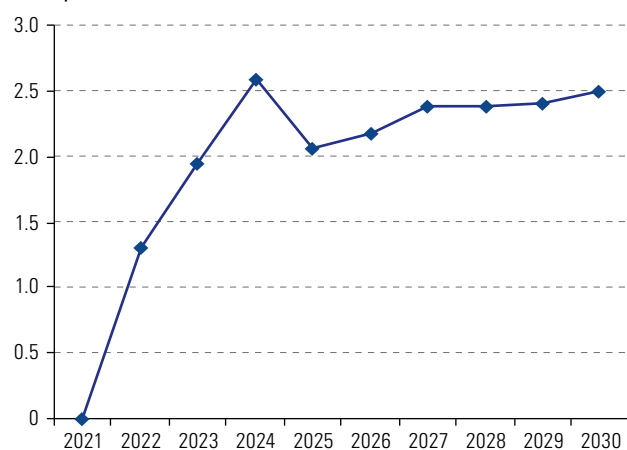
D. Government spending

E. Carbon dioxide equivalent emissions (CO₂e)F. Sulphur dioxide emissions (SO₂)

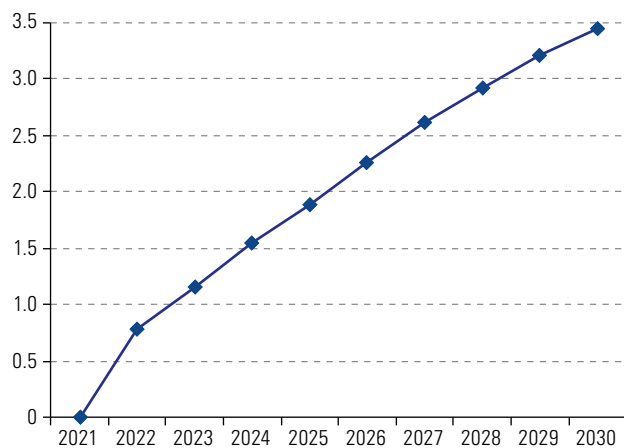
G. Exports



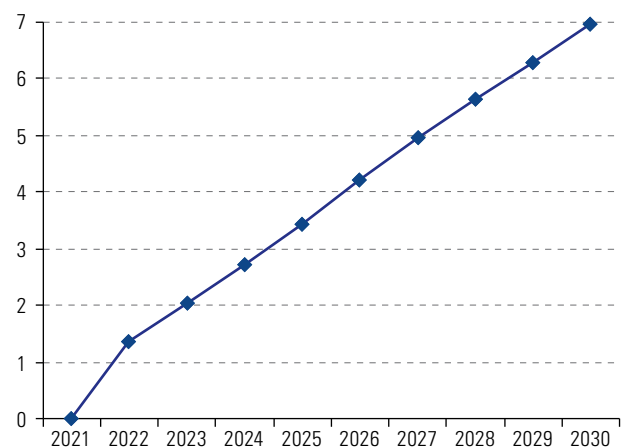
H. Imports



I. Employment



J. Total annual wages



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Cambridge Econometrics, E3ME model.

From an economic standpoint, the results suggest that in the sustainable development policies scenario, regional GDP would be 5.2% higher in 2030 than in the baseline scenario. The increase in economic activity is mainly driven by higher public spending (13.9% in 2030) and investment (8.5% in 2030) and, to a lesser extent, growth in consumption (1.9% in 2030). Rapid growth is reflected in higher employment and total annual wages paid to workers, around 3.4% and 6.9% above the baseline scenario, respectively, in 2030. This increase is equivalent to 10.4 million additional jobs compared to the baseline scenario. The faster growth in wages relative to employment indicates that new jobs are higher paying. Thus, in the scenario in which sustainable development policies are adopted, a key element for overcoming structural heterogeneity is achieved: sustained creation of formal jobs with higher productivity and pay.

In the environmental dimension, these positive socioeconomic results can be obtained in a way that is compatible with reducing GHG emissions. There is a significant reduction in GHG emissions measured as tons of carbon dioxide equivalent, which could be as much as 34.2% by 2030, compared to the baseline scenario. This reduction is much larger than the 28% that the countries of Latin America and the Caribbean have committed to achieve by 2030 (as mentioned in chapter II). In addition, sulphur dioxide emissions are also reduced (-13.9% in 2030), owing to less use of fossil fuels, which release this atmospheric pollutant, closely linked to phenomena such as acid rain, during combustion. As these results indicate, progress can be made simultaneously in closing social, economic and environmental gaps with the right mix of investments and policies in strategic areas for development.

However, the simulations also show that some challenges remain, in particular pressure on the trade balance, which tends to deteriorate owing to a greater impact on import growth than on export growth. A transition such as the one proposed here requires substantial adjustments, involving a reduction in the weight of some export sectors while at the same time increasing capital goods imports in the new sectors being developed.

There is also minimal pressure on income distribution, which shows no improvement.⁷ Specific policies are therefore needed for there to be greater equality in the functional distribution of income. Productive transformation policies are not enough: they will only have an inclusive effect if there are specific measures to redistribute income, which, in turn, create an environment of trust and cooperation that is more conducive to technological innovation. This is the case because, as highlighted in ECLAC (2018a), inequality undermines

⁷ Although income rises in all income quintiles, the rise is larger for the higher quintiles. For the first quintile (the poorest), income increases by 5.8%, while for the fifth quintile (the wealthiest) the increase is 6.4%. Wage increases are concentrated in jobs where wages were already higher in the absence of sustainable development policies.

the institutional environment, policies and initiatives, and weakens innovation and capacity-building. It is also important to recall that certain significant increases in the provision of public goods are not quantified in the Gini coefficient, primarily increases in public spending on health and education. Public provision of universal health and education services helps to reduce gender inequalities by lessening women's excessive burden of unpaid work and their time poverty.

The following sections of this chapter detail a broad set of policy recommendations and lines of action to move toward a structural change with inclusion and sustainability, based on the assessments of the first three chapters and the sector analyses of the fourth.

B. Development planning for policy coordination

The complexity of the set of policies required to move forward with a big investment push for sustainable development as proposed in this document means that effective coordination of those policies is required. Planning exercises are efficient coordination instruments. Planning can open up space for participatory discussion so that development stakeholders, led by the State, can build a sustainability narrative and a shared vision of the future aspired to on the basis of quality information and methodological rigour. These policy proposals, when set out in a transformative public agenda, should coordinate long-term plans with the targets, goals and strategies of short- and medium-term policy proposals and should foster coordination between the economic, social and environmental sectors and the various levels of government. Another important type of coordination is convergence between national and public investment plans and national budgeting, to guarantee sustainability and results in terms of public assets. Such convergence could promote better coordination between sectoral and national goals.

The tensions that arise in this type of effort are linked to institutional capacities and to the mechanisms for coordination and collaboration between State institutions and between those institutions and other relevant stakeholders. In that regard, the foresight capacities of States should be strengthened in order to build scenarios for probable futures and deepen engagement with society, by working together with academia, the private sector and innovation incubators.⁸ There is also a need to strengthen capacities for openness, participation, negotiation and planning for territorial development and to mainstream risk and disaster management. Lastly, collaborative leadership will be needed in order for processes to coordinate sectoral policies and cross-cutting approaches in national planning to be effective. The Intersectoral Committee for Land Policies, created by Argentina's national urban development plan in 2020, is an example of how to adopt an intersectoral approach and multi-stakeholder participation in planning exercises, in particular multi-level governance of planning processes, to reflect territorial issues in a coherent and integrated manner at the different levels of the State and geographical scope.⁹

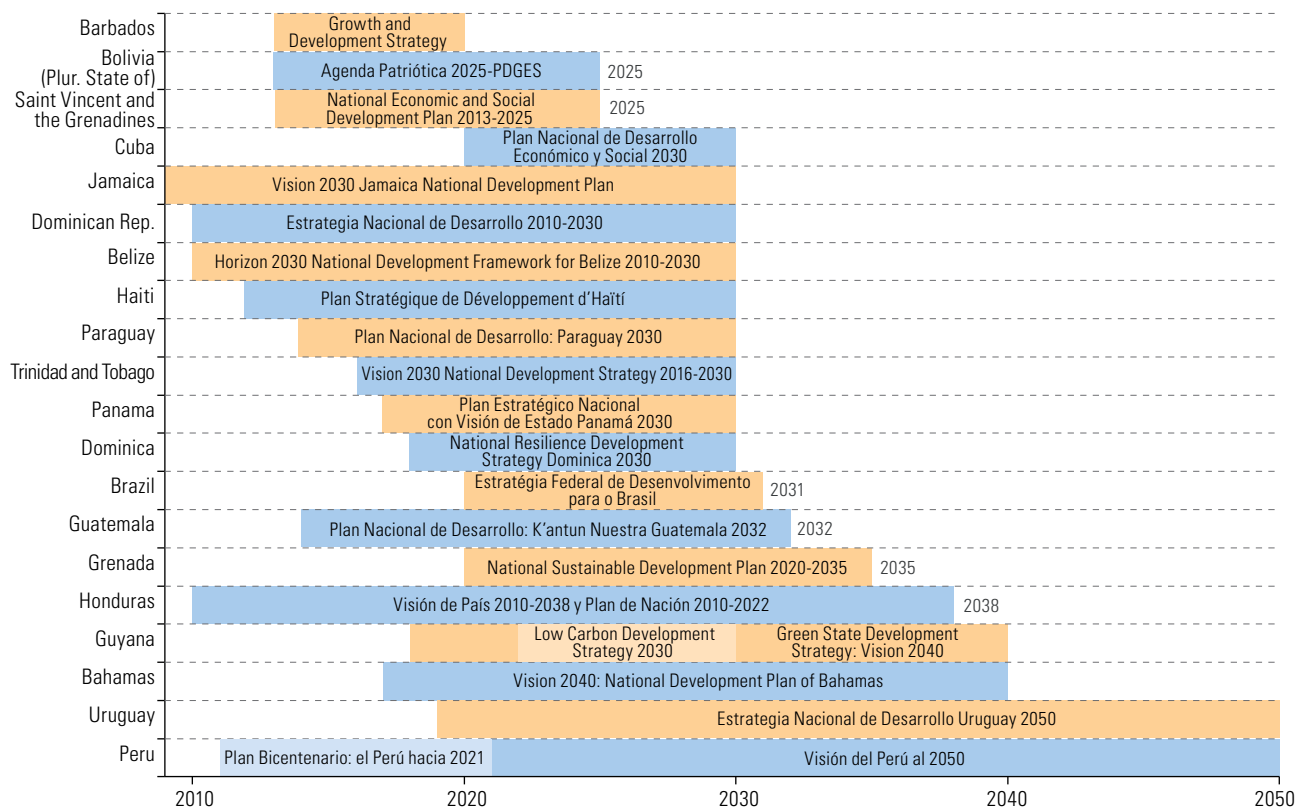
Long-term planning, an important step to foster the adoption of prospective approaches, is well established in the region. Figure V.2 shows that 20 countries have developed visions, plans and strategies with time horizons ranging from 2021 to 2050. The challenge is to maintain coordination between those visions and medium-term plans and policies, and for those visions to be adopted by citizens as their own and monitored by them as part of the oversight they provide, to achieve progress in incorporating them into State institutions so that truly anticipatory governance can become a reality.¹⁰

⁸ Foresight capacities are those that make it possible to collectively anticipate and build strategic development options in a participatory manner based on investment drivers that are determined and agreed on the basis of long-term thinking that transcends the government cycle (ECLAC, 2021g).

⁹ See [online] https://www.argentina.gob.ar/sites/default/files/pn_suelo_urbano.pdf.

¹⁰ The countries of the region have developed legislative frameworks and policy instruments for the exercise of the rights of access to information and participation as well as reporting frameworks: 23 countries have laws on access to public information, 8 have passed laws on public participation and 24 have signed the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean, also known as the Escazú Agreement, while 13 have ratified it. National public investment systems in 16 countries have project data banks, and in 7 countries, citizens have access to them. In addition, over the last decade, 16 countries have developed 63 open government action plans containing 1,264 commitments to action on transparency, access to information and accountability (ECLAC, 2022i and 2022j).

Figure V.2
Latin America and the Caribbean (20 countries): long-term planning



Source: Economic Commission for Latin America and the Caribbean (ECLAC), Regional Observatory on Planning for Development in Latin America and the Caribbean [online] <https://observatorioplanificacion.cepal.org/en>.

Based on a clear recognition of the need for a comprehensive approach to their formulation and implementation, the policy proposals are separated into different groups for the purpose of presentation and because of the need to respect the analytical frameworks and terminology of each area, which are derived in turn from the goals and practices —often long-term— of the different stakeholders. Therefore, the content of each strategy or policy must be linked and read as part of the set of proposals.

C. Macroeconomic policies to accelerate growth and address inflation

1. Monetary policy: use of all available instruments

(a) A difficult situation for the region's monetary policymakers

Latin America and the Caribbean, like the rest of the world, is facing a complex macroeconomic landscape, which has worsened following the invasion of Ukraine. Geopolitical tension has created a new source of uncertainty for the global economy and intensified two existing trends: global inflationary pressure —driven by supply constraints, sharp rises in prices for commodities and especially food and energy, and soaring transport costs— and lower levels of economic activity.

The war has decreased the availability of commodities of which the Russian Federation and Ukraine are key exporters (such as energy, agricultural products, fertilizers and some metals). This added to price pressure on commodity markets following the economic recovery from the COVID-19 pandemic. In 2021, a rebound in aggregate demand, coupled with supply and demand problems, high international transport costs and rising commodity prices, led to an acceleration of inflation in several developed and emerging economies. In particular, the rise in food and fuel prices at the international markets led to a rise in global inflation to levels not seen in recent years. Although a slowdown in economic activity was expected before the war, the conflict led to further cuts to projected growth in world trade and activity, as discussed in chapter I.

For the economies of Latin America and the Caribbean, the adverse external conditions mean lower external demand, worsening terms of trade for most of the region's countries, domestic inflationary pressure derived from rising global inflation, more constraints on and higher costs of external borrowing—owing to deteriorated global financial conditions—tightening of monetary policy in developed economies, larger exchange rate fluctuations and, in some cases, capital flight.

In this context, recent ECLAC forecasts point to slower growth in economic activity, with clear stagnation of investment. Similarly, the recovery in employment is expected to be sluggish, with a considerable increase in informality. In addition, inflation has risen to levels not seen since the global financial crisis, fuelled by faster external inflation and high prices for energy and food on international markets (ECLAC, 2022a).

(b) Monetary policy rate hikes and actions to slow aggregates

Despite the important (exogenous) supply-side component currently driving inflation, the region's central banks have responded with contractionary policies, albeit with different levels of intensity (see table V.2). Such policies aim to curb increases in aggregate demand and minimize propagation of second-order effects, which are related to exchange rates and capital flows and could unanchor economic agents' expectations.

Table V.2

Latin America and the Caribbean (12 countries):^a monetary policy rates, December 2020–July 2022
(Percentages and percentage points)

	Monetary policy rate on 31 December 2020 (Percentages)	First monetary policy rate hike	Monetary policy rate on 15 July 2022 (Percentages)	Variation (Percentage points)	Number of rate increases
Brazil	2.00	March 2021	13.25	11.25	11
Chile	0.50	July 2021	9.75	9.25	9
Colombia	1.75	October 2021	7.50	5.75	7
Costa Rica	0.75	December 2021	5.50	4.75	5
Guatemala	1.75	May 2022	2.25	0.50	2
Honduras	3.00		3.00	0.00	
Jamaica	0.50	October 2021	5.50	5.00	7
Mexico	4.00	June 2021	7.75	3.75	9
Paraguay	0.75	August 2021	7.75	7.00	10
Peru	0.25	August 2021	6.00	5.75	12
Dominican Republic	3.00	November 2021	7.25	4.25	6
Uruguay	4.50	August 2021	9.75	5.25	8

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures.

^a Includes countries from the region in which the interest rate is the main monetary policy instrument.

The conduct of the region's central banks contrasts not only with the generally more gradual action of developed countries but also with the policy responses of other developing regions in similar situations of high inflation, such as South-East Asia, where most central banks have raised monetary policy rates more gradually.¹¹

¹¹ See, for example, the case of some Asian economies as outlined in Sulaiman and Sriring (2022), and an introduction to the notion of monetary policy "normalization" in the case of European countries in ECB (2022).

The main risk of the policies undertaken in the region is that they may not be very effective in alleviating inflationary pressure, since it is primarily exogenous (supply shocks), but they could also accentuate the slowdown in economic activity and especially investment. Such measures may also prove to be ineffective in anchoring inflation expectations, which at present are predominantly based on uncertainty caused by geopolitical tension in commodity markets (especially energy and agricultural goods), resolution of persistent supply chain problems and rising international transportation costs. In addition, speculative actions by international investors in commodity markets are a key driver of price rises and price volatility.

(c) Monetary policy must ensure both price stability and macrofinancial stability

During the COVID-19 pandemic, it was apparent that monetary policy must not only ensure price stability, but also macrofinancial stability and, together with fiscal authorities, help prevent collapses in economic activity and employment. During this period, conventional and unconventional monetary policy measures were adopted in the region to support the payment system and prevent a liquidity crisis from turning into a crisis of solvency and sustainability of financial systems. Similarly, macroprudential regulations were adjusted to enable borrowers and financial institutions to cope with the slump in revenues caused by the crisis (ECLAC, 2020c).

Given the nature of the inflationary process, characterized by successive supply shocks and a high degree of uncertainty about its duration and magnitude, greater reliance on monetary policy rate measures could further complicate the dilemmas of macroeconomic stabilization and result in less importance being implicitly attached to the risk of financial instability than to the pursuit of price stability. Given the economic and social fallout from the recent crisis, excessive rises in monetary policy rates could either erode the resilience of regional financial systems (asset quality, profitability and solvency) or intensify pre-existing vulnerabilities by affecting household and corporate balance sheets.

In this regard, as far as companies are concerned, credit quality may decline owing to higher borrowing costs and the risk of insolvency of the most vulnerable firms, with repercussions for investment and employment. In the case of households, defaults, interest payments and other financial difficulties would increase, potentially exacerbated by job losses. In certain circumstances, given the partial dollarization of the economies, additional macrofinancial risks exist because of excessive exchange-rate fluctuations, such as those seen in recent years. Substantial risks may also arise from a feedback loop between possible financial shocks and growing inflationary pressures.

Although the current circumstances are different from those of the pandemic, their complexity means that economic authorities must be ready to support productive sectors, which have not fully recovered from the crisis caused by the pandemic and now face faster inflation, slow growth and higher financing costs. Different policy areas (monetary, fiscal, social, labour and financial) must also be coordinated, so that measures and instruments to address heightened inflationary pressure and mitigate its impact on households and companies can be calibrated as a whole, in a context of low growth and increasing poverty and inequalities.

(d) Macroprudential policy enables a different approach and focused measures

Raising monetary policy rates or constraining monetary aggregate growth are broad-spectrum policies that affect all economic agents and sectors. Macroprudential policy includes instruments that allow for greater targeting, even when authorities wish to adopt contractionary policies with regard to credit, and thus reduce undesirable effects on certain sectors.

Macroprudential policies, such as setting limits on consumer credit growth, can be used to discourage lending without affecting investment financing. Changes in macroprudential regulations could also facilitate financial support for micro-, small and medium-sized enterprises (MSMEs); this is particularly true for those that create jobs for women and young people. This point is important because the post-pandemic recovery has been uneven, partial and slow. The effects on households and companies, which emerged from the pandemic with higher levels of indebtedness, have been severe, while some productive sectors have yet to return to pre-pandemic activity levels (ECLAC, 2022a).

(e) Macroprudential policy can strengthen exchange rate policy aimed at stabilizing exchange rates

The current environment, characterized by intense global inflationary pressures and expectations of slower growth worldwide, is likely to accentuate macrofinancial risks linked to international capital flows and drive excessive exchange rate volatility. Recent years have seen growing exposure in the region to the risks generated by the link between exchange-rate fluctuations and international capital flows, largely owing to the considerable trade and financial openness of the region's economies (see ECLAC, 2022a).

Furthermore, the tightening of monetary measures in advanced economies has put further pressure on the financial systems of developing countries, including those in the region, with severe and prolonged repercussions for the real sector.

Since the onset of the crisis caused by the COVID-19 pandemic, capital flight—and the resulting cumulative depreciation of local currencies—has tended to revive certain exchange rate transmission channels to the real, monetary and financial sectors. Through imports, local-currency depreciation can directly accelerate inflation, owing to the high share of tradable goods in the reference consumption basket (food and energy) and, indirectly, from the pass-through of global inflation to domestic prices through higher production, distribution and transportation costs, as rising international prices for commodities spread to all components of the basket.

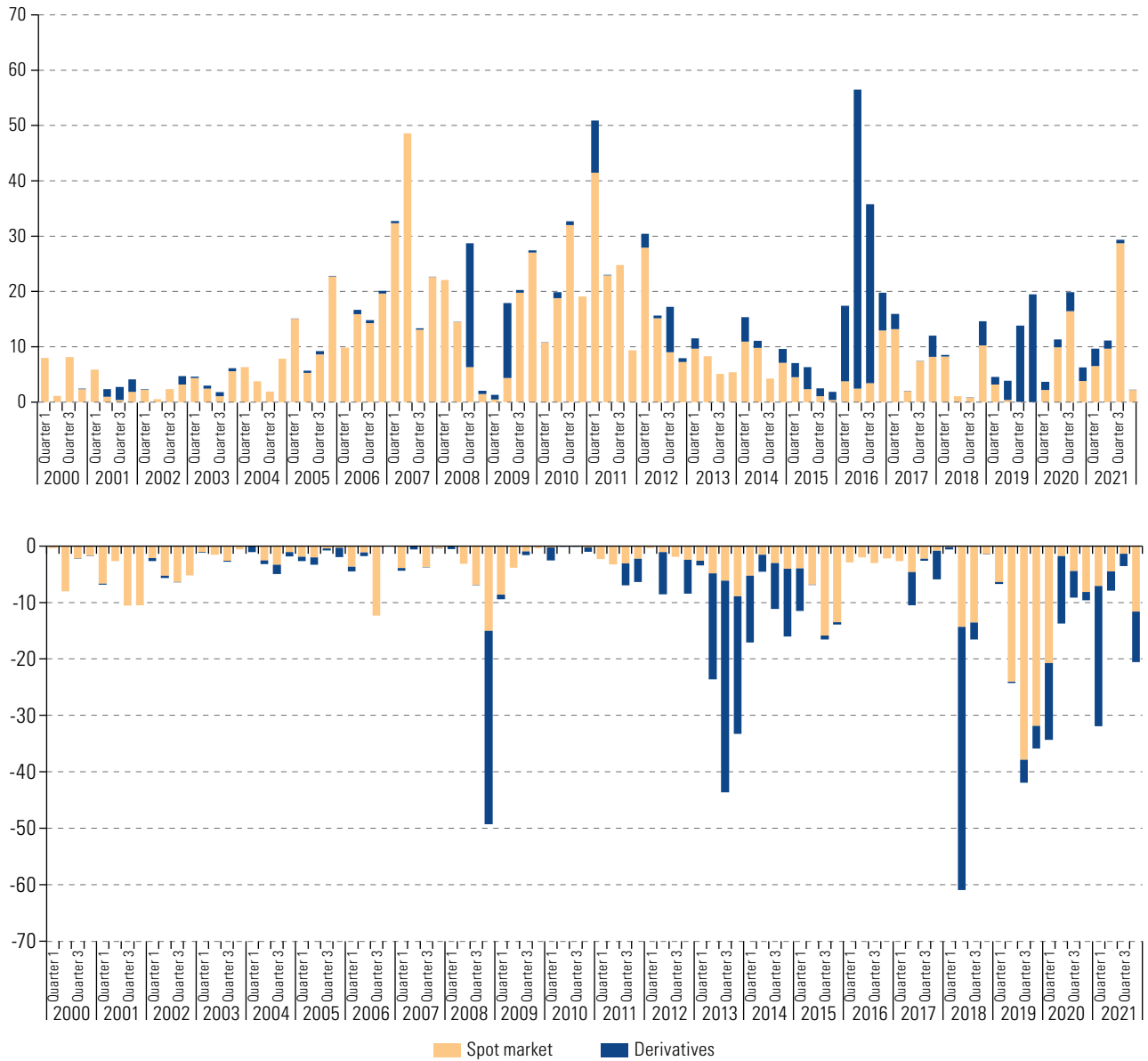
Capital flow volatility and exchange-rate fluctuations may intensify exchange-rate pass-through via the financial channel and worsen domestic financial conditions. High exchange-rate volatility triggers currency mismatch risks—in particular where countries engage in considerable foreign-currency intermediation—with a direct impact on bank balance sheets and indirect effects on household and corporate balance sheets. Therefore, persistent local-currency depreciation pushes up the debt burden and the cost of debt servicing, and, in turn, increases credit risk, triggering capital flight, tighter financing conditions and successive currency depreciations. Exchange rates also affect capital markets with more international investors, whose risk aversion is higher. Lastly, exchange rate fluctuations have a noteworthy impact on the real sector through the trade channel, since appreciation of the dollar, for example, drives up the local-currency amount of commercial borrowing. In such situations, local-currency depreciation does not provide an automatic boost for the exports of the countries in the region.

To respond to the effects of heightened financial and currency volatility, monetary authorities should therefore continue to use multiple tools, such as intervention in foreign-exchange markets and diversification of foreign-exchange instruments, in addition to macroprudential measures focused on foreign-currency balances and capital control, to preserve macrofinancial stability and avoid further opening channels for pass-through of excessive exchange-rate fluctuations.

While macroprudential rules and the use of derivatives in foreign-exchange interventions reduce the degree of short-term dependence of such actions on the availability of external assets, they also reduce the short-term direct impact on the stock of international reserves. Both instruments—macroprudential exchange-rate rules and derivatives used in interventions—have been increasingly used in the region in recent years (see figure V.3). The current situation should be no exception.

Figure V.3

Latin America and the Caribbean (21 countries):^a foreign-exchange interventions by type of instrument used, 2000–2021
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of G. Adler and others, “Foreign exchange intervention: a dataset of public data and proxies”, *IMF Working Paper*, N° WP/21/47, Washington, D.C., International Monetary Fund (IMF), 2020.

Note: The chart shows the interventions by central banks in the dollar exchange market using the spot market and other financial instruments (derivatives). Since the data are presented on a quarterly basis, a central bank may sell foreign currency (positive values) or buy foreign currency (negative values) during the same period, as the nature of the intervention in the market may change during the quarter.

^a Argentina, Bahamas, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Plurinational State of Bolivia, Trinidad and Tobago, and Uruguay.

(f) Boosting public and private investment cannot come second to anti-inflationary policies

Adopting policies to encourage investment cannot come second to measures to address the current situation, particularly inflationary pressure, especially in a context of abruptly slowing economic growth and supply that has not fully recovered from the effects of the pandemic.

Investment patterns in the region changed substantially after the 1980s debt crisis, with a significant slowdown in investment from the 1990s onward (ECLAC, 2022a). It has also accounted for a systematically smaller share of GDP since the 1980s, after having reached a maximum average of 22% in the 1970s. Investment has been more volatile since the 1990s, with more frequent, more intense and longer cycles of contraction. To set a course of inclusive sustainable development that will reduce poverty and inequality and to make the changes required to reduce carbon dioxide emissions, the region's economies need to greatly increase investment in human, physical, social and natural capital. This would create a virtuous circle that would lessen the coordination problems that hamper adoption of new and better technology and thus hinder productivity growth. International cooperation must complement mobilization of domestic resources; therefore, official development assistance and financing from global financial institutions and development banks must be significantly increased.

Public investment is very low in Latin America and the Caribbean, in relative and absolute terms, and substantially lower than in the emerging and developing economies of Asia in recent decades, during which these countries have built dynamic and diversified economies (ECLAC, 2022a). Limited investment flows have resulted in a stock of public capital that is insufficient to provide the economic and social services needed to boost growth and lay the foundations for sustainable and inclusive development.

These results tally with other ECLAC analyses (2018c), which show that patterns in economic activity are a key determinant of investment trends and vice versa. These variables are positively correlated, meaning that an increase (decrease) in economic activity brings about an increase (decrease) in investment, through two channels: the expenditure multiplier effect and the accelerator effect. To prevent the trend of slowing economic activity from magnifying the trend seen in investment over the past decade, economic policy—and particularly monetary policy—must not accentuate the slowdown in economic activity by focusing on reducing inflation through monetary policy rate hikes, which reduces aggregate demand and especially investment. Monetary policymakers should instead attempt to maintain stimulus packages, so that productive sectors do not cut their investment, despite the forecast slowdown in economic activity and aggregate demand. Higher interest rates, particularly monetary policy rates, also have a harmful impact on investment patterns. While macroprudential policy changes may have a smaller impact than monetary policy rate hikes on general financing conditions, targeted limits on credit, such as restrictions to reduce growth in consumer lending, have less of an effect than monetary policy rate hikes on investment.

The extent of the impact of some macroeconomic variables could vary depending on companies' financial situations and effects could be non-linear. In other words, there are thresholds in certain variables—for example levels of corporate debt—above which changes in some macroeconomic variables, such as the interest rate, may not stimulate investment. Specifically, companies' limited financial capacities, owing to their indebtedness, would prevent them from reacting to the positive stimulus of a cut in interest rates. However, in a situation such as the current one, in which companies have high levels of debt owing to measures to address the pandemic's effects, the fact that the relationship is non-linear could mean that even small changes in the interest rate could trigger disproportionate reductions in companies' investment, given that their balance sheets, which are already weakened, could deteriorate because of higher borrowing costs and the more limited liquidity that allocating more resources to interest payments would entail. This situation is aggravated by the prospect of a decline in revenue in a low-growth scenario.

Once again, monetary authorities can prevent such trends from becoming more pronounced—with liquidity restrictions undermining not only companies' capacity to invest but also their ability to continue operating—by accompanying conventional monetary policy with macroprudential rules to identify sectors and companies that may be in such situations. Authorities should therefore avoid sustained interest rate hikes, as the medium- and long-term effects can be very harmful for growth in economic activity and creation of high-quality jobs.

2. Fiscal policies to boost investment and growth

(a) Expand and coordinate public investment and encourage private investment

Public investment in the region is low and the stock of public capital is limited. General government gross fixed capital formation in the region is below the levels of emerging and developing economies in Asia (ECLAC, 2022a). The low level of investment has led to an insufficient stock of public capital to provide the infrastructure and economic services required to boost growth. This limited capital stock is also undergoing ever-faster depreciation, in a context characterized by the increasingly intense effects of climate change.

Reversing this trend requires a strategic approach to public spending that promotes investments with high economic and social returns. An investment framework is needed that interlinks sustainable development plans with the institutional framework for public investment, accompanied by investment strategies to encourage private sector participation. Within this framework, national public investment systems play a key role in linking public investment and development needs, and in monitoring investment projects to increase their effectiveness and efficiency. Measures to strengthen these systems are important because although in principle public investment should be properly coordinated, in practice the multitude of decision-making areas and parties can lead to considerable inconsistencies or contradictions between the decisions of line ministries, autonomous agencies, subnational and local entities, and even publicly owned enterprises, some of which may have budgets larger than those of many ministries.

Facilitating access to bank and capital market financing through financial instruments adapted to different risk profiles and project maturities is key to encouraging private investment. Development banks can play an important role in this by formulating and operationalizing innovative instruments. As analysed in chapter IV, using tax incentives to support sectoral strategies can also be effective in boosting investment, because tax expenditures that target specific sectors have clear goals and respect criteria of timing, transparency and additionality. Economic growth and exchange-rate and monetary stability are vital components of an environment that is conducive to investment. These macroeconomic measures should be combined with the proposals presented in the section on industrial and technological policies in this chapter.

(b) Measures to expand fiscal space

A paradigm shift in fiscal policy in the region requires strengthening of public revenues, to create the fiscal space needed for the recurrent expenditures of a transformative recovery and sustainable and inclusive development (ECLAC, 2022c). Public revenues have historically been insufficient to cover the demands of public spending, with consequences in terms of indebtedness and the sustainability of public finances. In this context, the sustainability of fiscal policy should focus on strengthening tax revenues and making tax systems more progressive. In addition, a strategic approach must be adopted with regard to public spending, to improve its effectiveness and target actions with high economic, social and environmental returns. An agenda for a new fiscal framework must take into account the need to pursue administrative and tax management measures that, in the short term, successfully shore up revenues, and the need to forge political and social agreements, so that in the medium-term tax systems can be reformed to make them more progressive and increase recurrent revenues, with a view to meeting well-being, investment and environmental sustainability needs in the countries of the region.

There are multiple opportunities to boost tax collection in the short term. Tax evasion results in significant loss of tax revenues in the region. Unpaid value added tax (VAT) and income tax is estimated to have amounted to US\$ 325 billion in 2018, equivalent to 6.1% of regional GDP (ECLAC, 2020b). Addressing this challenge will require significant investments in tax and customs authorities, with measures including introduction of large-scale e-invoicing, cross-referencing of data between authorities' databases, use of big data to detect inconsistencies in tax returns and creation of digital portals and apps to facilitate tax filing. It is also important to strengthen estimation and quantification of tax evasion in order to generate data for decision-makers in this area. In addition, tax frameworks should be modernized to incorporate the most recent best practices

in international taxation, strengthening transfer pricing rules, anti-abuse regulations and controls on foreign assets. At the international level, it is important to take full advantage of the new measures included in the Inclusive Framework on Base Erosion and Profit Shifting, as well as the automatic exchange of financial and tax information processes.

Another area to consider in the short term is the application of preferential tax treatment, known as tax expenditures. These tax treatments result in average forgone revenue of around 3.7% of GDP in Latin America, equivalent to 17% of central government budgeted spending (ECLAC, 2019a). There is little information on their efficiency and effectiveness in achieving the aims for which they were established, such as encouraging investment (ECLAC/Oxfam International, 2019). Tax expenditures can make tax systems less progressive by concentrating benefits in the top deciles of the income distribution. In this regard, it is important to take measures to strengthen governance of tax expenditures, in order to maximize their cost-benefit ratio and align them with the SDGs.

In addition, countries have tax instruments to promote sustainable development, including environmental taxes and taxes linked to public health objectives (see section F below). Most countries in the region could expand taxes whose bases are related to the environment, such as selective taxes on energy and fuel consumption. However, only a small number of countries have implemented more advanced taxes such as those related to GHG emissions. In addition to reducing those emissions, carbon taxes would help to bring about changes in the production structure. Consideration could also be given to taxes on unhealthy products, such as high-calorie foods and sugary beverages. Greater focus should be placed on changing consumption patterns rather than on tax revenues.

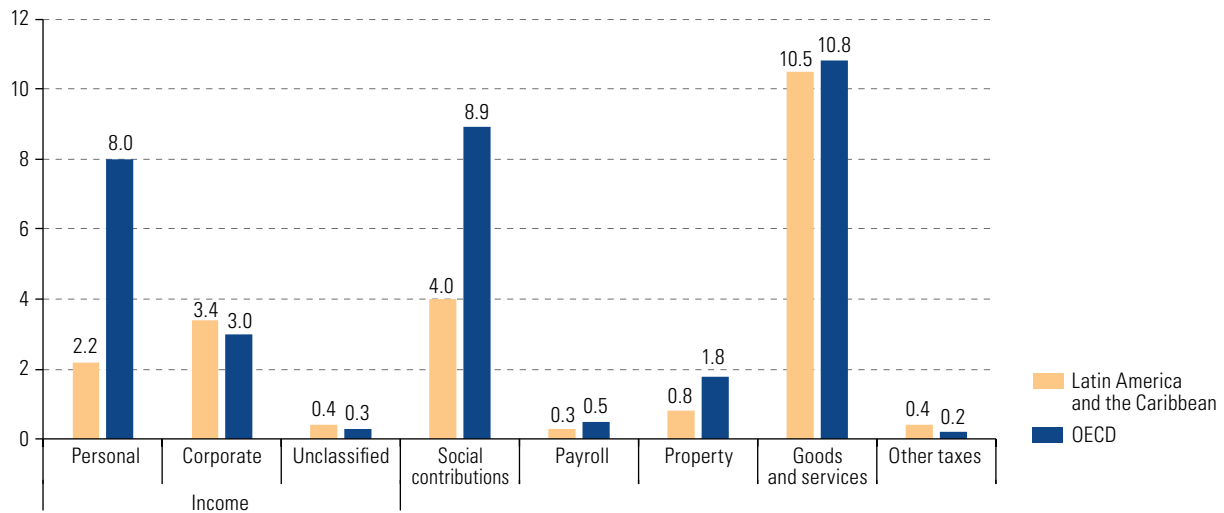
In the medium term, it will be important to move forward with measures to strengthen collection of direct taxes on income, property and wealth (ECLAC, 2021b). One of the main tax gaps between the region and Organisation for Economic Co-operation and Development (OECD) countries is in personal income tax revenues. In 2020, they averaged 2.2% of GDP in the region, compared to 8.0% of GDP in OECD countries (see figure V.4). In addition to generating limited resources, the weakness of personal income tax limits the redistributive power of the tax system, meaning that the resulting reduction in the Gini coefficient is very small (ECLAC, 2018b). Measures that can improve the collection of personal income tax and its redistributive power include broadening the tax base, which is narrow owing to numerous exemptions and high levels of non-taxable income, relatively low marginal rates and high levels of tax non-compliance.

Public spending in the region is under growing pressure owing to a rapid demographic and epidemiological transition, the public investment needed to boost growth, widening social gaps and the action required to address climate change. Responding to these challenges calls for strategic targeting of public spending that prioritizes government measures with high economic and social returns and promotes sustainability. These initiatives must be accompanied by measures to strengthen fiscal institutions and make public spending more efficient, effective and equitable.

In this context, public debt management is key to meeting financing needs. The gross public debt of central governments in the region rose considerably in 2020, reaching levels not seen in recent decades. In Latin America, public debt-to-GDP stood at 56.6% in 2020, compared to 45.4% in 2019 (ECLAC, 2022a). Similarly, the public debt-to-GDP ratio for the Caribbean, which was already high, reached 89.3% in 2020, compared to 68.2% in 2019. Therefore, it is important to strengthen the institutional framework for public debt through active management aimed at improving debt profiles and structures in terms of currencies and interest rates. Debt instruments should also be reviewed, and measures should be taken to establish restructuring mechanisms to reduce uncertainty for countries and investors. Another area for consideration should be expanded use of natural disaster clauses—particularly in the Caribbean and other countries that are highly vulnerable to such events—to make public debt more sustainable in the event of exogenous shocks that affect the economy and fiscal accounts.

Figure V.4

Latin America and the Caribbean and countries of the Organisation for Economic Co-operation and Development (OECD): general government tax structure, 2020
(Percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Organisation for Economic Co-operation and Development (OECD) and others, *Revenue Statistics in Latin America and the Caribbean 2022*, Paris, OECD Publishing, 2022.

Note: OECD figures are for 2019 (latest available).

Cultivating a paradigm shift in fiscal policy in the region will require new fiscal covenants and social compacts for sustainable development. These should link the strengthening of tax collection with efficient and effective public spending that guarantees provision of quality public goods and services. Economic and social agreements are key to creating progressive tax systems that can generate sufficient revenues to cover the recurrent expenditures required to drive sustainable and inclusive development. As part of this approach, public spending must be an instrument of development, with a strategic perspective that fosters investment, social protection and less inequality.

3. Financing for development

The social and investment challenges that the countries of the region face are so great that domestic resource mobilization efforts need to be complemented by external resource mobilization. In this regard, the ability to mobilize global resources through financing for development is key to increasing countries' capacity to finance investment.

(a) Make special drawing rights use more flexible

The international community's most compelling response to the effects of the pandemic was to issue special drawing rights (SDRs) equivalent to US\$ 650 billion, the largest issuance in the history of the International Monetary Fund (IMF). There is no prescribed use for SDRs and they have proven to be a highly versatile instrument. In Latin America and the Caribbean, SDRs were used to increase central bank international reserves, for fiscal purposes (fiscal spending and debt restructuring) and to repay external debt to IMF. Despite being an international reserve asset at the global level, the rules governing SDRs mean that they can only be employed in limited ways. The required expansion of SDRs must take into account the following:

- (i) Increasing the number of prescribed holders of SDRs. There are currently only 15 such holders and just 2 in Latin America and the Caribbean (Latin American Reserve Fund (FLAR) and the Eastern Caribbean Central Bank). Since this does not reflect the financial reality of the region, subregional banks should be prescribed SDR holders, as is the case of the African Development Bank (AfDB).
- (ii) Analysing how subregional banks could use SDRs to increase their lending capacity.
- (iii) Exploring the possibility of using SDRs as capital, even though they are reserve assets. Their liquidity and zero-risk nature are relative, and could easily be maintained. Consideration could be given to an arrangement similar to that of the Poverty Reduction and Growth Trust (PRGT), which has a reserve fund and bilateral agreements with the countries that lend SDRs to maintain their international reserve asset characteristics.

(b) Strengthen cooperation and collaboration among development banks

Strengthening the lending and response capacity of multilateral, regional, subregional and national development banks and regional cooperation and coordination among them is one of the pillars of the response to the challenges of financing for development.

Not all development banks have the same lending capacity or access to the same financing conditions. The main barriers that development banks face in expanding their lending is limited access to low-cost sources of financing, insufficient long-term capital, a lack of experience and technical capacity to access funds and to design projects that are in line with financing requirements, and deficient institutional coordination and interlinking of the public and private spheres, as well as a lack of a strategic approach to investment and productive development policy.

Possible areas of cooperation among financing institutions include technical support from multilateral banks to strengthen the internal organization of financial institutions involved in green financing, capacity-building and development of green finance products. Bank associations can also be key players in promoting voluntary green protocols that integrate financial institutions in green finance strategies. Strategies to foster cooperation among development banks include the exchange of information through knowledge platforms and networks with a view to sharing and disseminating best practices in financial instruments and technological innovation, including green technologies.

Knowledge-sharing through technology platforms could be conducive to the formation of a working group, composed of national development banks, to establish a joint knowledge-sharing programme and form strategic partnerships between institutions that design and use similar products. Guides could also be prepared on good practices related to development bank financing in specific sectors.

To implement best practices, senior authorities will have to fully commit to designing a specific strategy. In some cases, it may be advisable to revise the regulatory frameworks and mandates of development banks to provide for greater flexibility in the use of innovative financial instruments.

The Latin American Association of Development Financing Institutions (ALIDE), the Inter-American Development Bank (IDB) and ECLAC have joined forces to develop a knowledge-sharing platform for development banks on green finance.

(c) Expand the lending capacity of development banks by strengthening guarantee systems

One of the aims of development banks is to meet the financing needs of the productive sector with different combinations of instruments and forms of financial support. National development banks' response to the COVID-19 pandemic showed that guarantee systems are an effective tool to address the liquidity gap faced by MSMEs.

Credit guarantee systems can expand the supply of credit from the financial system, facilitate access to the formal financial system, improve credit conditions and increase integration between the financial system and the productive sector.

Although guarantees are mainly aimed at MSMEs, owing to their vulnerability and their role in job creation, in some countries (Chile, Colombia, Costa Rica and Uruguay), large companies have also benefited.

(d) Explore the use of innovative financing instruments: income-linked bonds

The financing needs of Latin America and the Caribbean have grown significantly since the pandemic, mainly because of the rise in public and private indebtedness. Debt distress exists in 30% of developing countries and 60% of low-income countries. In Latin America and the Caribbean, the smallest countries face heightened sovereign risk, which restricts access to external financing and makes it more expensive.

One way to address this situation is to explore the possibility of linking debt service payment capacity to the economic cycle. A bond linked to national income can perform this function by taking into account how the external sector affects the performance of the region's economies (through remittances and terms of trade).

The income-linked bond is an extension of the GDP-linked bond for developing economies, as the importance of the external sector, including terms of trade and remittances, is factored in to determine a country's economic fluctuations. Income-linked bonds offer less risk and thus greater credibility for investors than GDP-linked bonds, since they include more exogenous factors, making it harder to manipulate numbers.

The fact that gross national income includes a broader set of variables may mean that this indicator is less volatile than GDP. Not all the variables included in gross national income move in the same direction during business cycles, so upward movement in some of them is somewhat offset by downward movement in others. Less volatility leads to a lower risk premium.

(e) Caribbean Resilience Fund

Caribbean economies are highly vulnerable to natural disasters, which hinder their productive capacity, investment and growth in the medium and long term and increase their debt levels. These economies face a context of external restrictions, large fiscal deficits and high debt levels that —combined with significant external imbalances— would be unsustainable in any other type of economy. To address this situation, in recent years, ECLAC has advocated creating a resilience fund as a vehicle for financing of investment in climate change mitigation and resilience.¹² Four central issues must be addressed for the trust fund to be well-designed and operate effectively: location, capitalization, operations and size, and additional sources of funding.

The fund could follow the model of Costa Rica's development banking system and be a network of different institutions involved in natural disaster resilience and debt issues. This is central to defining how it is governed. A conservative leverage ratio of 10 could be targeted. The fund would be capitalized by member countries from their national budgets and quotas would be established on the basis of countries' financial capacity.

D. Consolidating welfare states for a sustainable future

1. Toward less unequal societies and a just transition to sustainability

In a context of uncertainty and simultaneous crises, it becomes urgent to tackle inequality if the aim is to strengthen human capabilities and social cohesion. This task requires a twofold approach that takes into account new challenges and the complex structural processes that have perpetuated inequality in the region. Historically,

¹² See [online] <https://www.cepal.org/en/events/high-level-meetings-eclac-caribbean-resilience-fund>.

inequality has been perpetuated by a production structure with little diversification and low productivity. This structure creates a limited number of decent jobs, and instead tends to generate informal, precarious employment with no access to social protection mechanisms (ECLAC, 2012). In addition to the production structure, the high levels of inequality are also a reflection of the lack of redistributive tax policy or universal social protection systems that can correct such inequality. In addition, the pandemic has exacerbated large structural gaps in the region, including the high levels of inequality and the socioeconomic impacts thereof (Cecchini, Holz and Soto de la Rosa, 2021; ECLAC, 2022d).

In addition to undermining the well-being and rights of most people, inequality is inefficient: its costs weigh not only on productivity but also cause environmental degradation and compromise the development possibilities of future generations (ECLAC, 2018a). Inequality undermines recovery and the possibility of a just transition to sustainable development. Available data shows a close correlation among high Gini coefficients, high inequality and low productivity growth, suggesting that inequality tends to hamper productivity growth (Fernández-Arias and Fernández-Arias, 2021). Historically, inequality has been linked to power structures in which the ruling classes and elites have prevented or blocked attempts at tax reform of a redistributive nature, as well as transformations to make production more inclusive.

Analysis and design of public policies must therefore take into account the structural processes that give rise to gaps in capacity, productivity, well-being and rights, and seek to close the various gaps, adopting a universalist approach that is sensitive to differences. This entails considering the conditions and specificities of the different population groups throughout the life cycle and in all their diversity. Examined from this perspective, the matrix of inequality reflects these multiple areas of well-being and rights in which various axes that structure inequality (such as socioeconomic level, gender, race and ethnicity, age, territory and migration status) overlap and intersect to create discrimination and exclusion; this must be taken into account in policy design (ECLAC, 2016b).

In that regard, the Regional Agenda for Inclusive Social Development provides a road map to guide public policy based on universalism that is sensitive to differences, with synergies between inclusion, equality, productivity, resilience and sustainability (ECLAC, 2020d). In particular, the Agenda proposes interlinking policies for the development of universal, comprehensive, sustainable and resilient social protection systems to eradicate poverty and significantly reduce inequalities, with social and labour inclusion policies, as well as with other policies to combat discrimination in all its forms. This, as part of an institutional framework for social policy that provides continuity, coherence and legitimacy to policies and programmes, beyond political and electoral cycles, and in which international cooperation and regional integration are facilitating factors. The challenge of increasing productivity extends well beyond measures relating to the productive sphere and beyond promoting innovation, research and incorporation of new technologies. It involves building people's capacities in coordination with social protection and labour policies, while addressing challenges arising from changes in the world of work, as part of efforts to build social protection systems and genuine welfare states.

The first step in creating an equality-focused agenda is to lay the foundations of well-being from early childhood onward. This is not possible without creating universal comprehensive care systems that guarantee every child access to quality care, early learning, early education and health care and adequate nutrition. This requires protecting the incomes of the households in which they live and creating enabling conditions for them to reach their full potential. Second, education systems must be restructured and strengthened to make them more inclusive and resilient. This is one of the great challenges facing the region, which must capitalize on the lessons learned from the pandemic to eliminate the risk of a lost generation.

Third, the transition from school to work is a critical period, for which comprehensive policies to safeguard the ability of adolescents and young people to reach their full potential are essential (López, 2021). Young people's labour inclusion under decent conditions and with guaranteed access to social protection, requires concerted measures involving education, labour and production policies. Also needed is a strategy for continuous development of competencies and capabilities, including cognitive, social, emotional and physical skills (ECLAC/OEI, 2020), promoting acquisition of digital skills from an early age.

Employment is the key to equality (ECLAC, 2010) and requires strong linkages among: (i) labour regulation policies, with a solid institutional framework; (ii) social protection policies that ensure access to coverage and insurance against risks for all workers and enable them to fully develop their skills and capabilities; and (iii) economic and productive development policies, within a care society that addresses the unequal distribution of paid and unpaid work. If this is to be achieved, there is a need for cross-cutting recognition and levelling of the conditions under which care is received and given and conditions for entry into the labour market, in order to guarantee dignified old age for all. To make progress toward societies that are increasingly adaptable to a changing environment and that foster and enable a just transition to sustainable development, there must be synergy between economic, environmental and social development policies.

In short, achieving greater equality requires inclusive broad-based productive development, because inequality is tied to the region's heterogeneous production structure. It calls for sustainable social investment and quality social policies to build individual capabilities, together with labour inclusion policies, not only taking into account the inherited gaps in quality and coverage, but also the challenges of technological change and its effects on education, health and labour. It also requires fiscal policies on both spending and income that aim to reduce inequalities and develop more redistributive tax systems, as described the previous section. In addition, progress in education and health has two benefits: it promotes effective enjoyment of human rights, which remains an historical debt for many, and is also an investment with returns in terms of productivity, the adaptability of economies and inclusive and sustainable social development.

2. Social protection systems in an era of uncertainty

Universal, comprehensive, sustainable and resilient social protection systems are key to structural change with equality and sustainability and are at the core of the gradual construction of welfare states. At a time of great regional and global uncertainty, where several simultaneous crises are affecting the well-being of most people and widening inequality gaps, it is more necessary than ever to consolidate permanent mechanisms for addressing a wide range of risks and shocks, whether individual, collective, local, national or external. These risks may originate in the economic and productive sphere, or may be linked to the increasing incidence of disasters, the adjustments and costs associated with technological change or even the imperative of achieving a just transition to a sustainable development model, as well as those related to the life cycle.

Given this new matrix of systemic risks and the heightened vulnerability to its effects, it is essential to consolidate universal comprehensive social protection systems that leave no one behind and offer a broad range of programmes, and which are resilient to the new risk structure, sustainable and fulfil their obligations to ensure rights as part of a welfare state. Access to universal, quality public services, which cover education, health, transportation and environmental services, among other areas must be expanded (ECLAC, 2021c). Such a system must also address the structural obstacles that reproduce inequality and gender gaps and should contribute to more equitable distribution of power, resources and free time between women and men in order to move toward a new pattern of development based on equality, sustainability and a care society, as discussed in detail in the next section of this chapter. Moreover, without a universal guarantee of a certain level of well-being, the transition toward more sustainable consumption and production patterns will continue to appear risky or even unacceptable for various sectors of Latin American and Caribbean societies. Precariousness and a lack of protection are barriers to development that erode social cohesion (ECLAC, 2022b).

Given the need to continuously and collectively address this complex risk matrix and seize the opportunity offered by the pandemic to raise awareness of the key role of social protection systems, the following general guidelines are vital. Firstly, there is a need to consolidate social protection systems with a life-cycle perspective and a universalist approach that is sensitive to differences (ECLAC, 2020a) to permanently ensure the equal exercise of people's social rights at different life stages. In particular, it is urgent to safeguard children and families with children and adolescents, whose significant protection gaps have been exacerbated by the pandemic (ECLAC/UNICEF, 2020). At the other end of the life cycle, strengthening universal, comprehensive and sustainable pension systems is a pressing matter in view of the ongoing demographic transition and

the low levels of coverage and inadequacy of pensions in the region (ECLAC, 2022b). Progress is urgently needed to achieve agreed well-being levels and better coordination between contributory and non-contributory instruments to ensure the sustainability of policies, in terms of their coverage, sufficiency and financing (Arenas de Mesa, 2019).

With regard to income, the pandemic has shown the need for mechanisms and provisions to guarantee well-being and adequate levels of consumption during crises and to overcome the risk of poverty. Such measures should be operational in emergencies, with those implemented during the pandemic as well as those applied on a regular basis becoming institutionalized (Robles and Rossel, 2021). Other proposals include the possible consideration of a cash transfer for children as a first step toward a permanent policy of universal basic income (ECLAC, 2021c; United Nations, 2020). It is also essential to introduce new contributory entitlements and extend the scope of existing ones with extremely limited coverage in the region, including unemployment insurance and paid sick leave, among other social security benefits. Informal workers, who are largely excluded from access to social protection, also require specific and urgent attention, as the experience of the pandemic has shown. This situation has also demonstrated that without health, inclusive social development and sustainable economic growth are not possible; it is therefore necessary to strengthen universal, comprehensive and sustainably financed health systems (ECLAC/PAHO, 2021; ECLAC, 2022b).

It is not only necessary to establish closer linkages between social inclusion, social protection and labour inclusion policies, but also to increase investment in capacity-building, ensure lifelong learning, as well as access to social protection, and give care policies a central role to tackle gender inequalities in the world of work.

Lastly, these advances in terms of coverage, financial sustainability, quality of services and interlinking and coordination of policies requires reinforcing institutional frameworks for social policies with a regulatory and legal foundation in line with definition of long-term public commitments, and a rights-based, gender-based and universal approach that is sensitive to differences. Also required are effective horizontal and vertical coordination mandates and mechanisms and appropriate and efficient instruments for policy implementation and management, and especially social information, monitoring and evaluation systems.

3. Labour inclusion: the key to closing inequality gaps old and new

The COVID-19 pandemic and the measures to contain it have had significant labour market repercussions in the countries of the region. In 2021, despite the recovery in key labour indicators, figures for the most affected population groups —such as women, young people and informal workers— were still worse than before the pandemic, suggesting an uneven recovery and in some cases wider gaps, adding to existing inequalities.

In order to move toward labour market inclusion for these groups, which have historically faced greater barriers to entry and difficulty in retaining decent jobs, the countries of the region must adapt and strengthen active and passive labour market programmes and policies, including policies for training, direct employment support and labour intermediation. To increase the effectiveness of these programmes for the most vulnerable groups, they should be implemented together with income support measures and coordinated with education, social protection systems and care services.

In the case of informal workers, although very innovative cash transfer programmes were created or temporarily expanded, many of these measures were conceived as social protection responses rather than labour inclusion responses. They were generally not linked with other active policies, such as labour intermediation and training, which illustrates the need to move toward integrated mechanisms that offer protection in the event of job losses for the most vulnerable groups. A re-examination of labour informality is necessary, taking into account both the structural gaps that persist in Latin America and the Caribbean and rapid global technological transformations. The emergence of new forms of informal work, including through digital platforms, poses public policy challenges. First, the most pressing challenge is to ensure minimum levels of social protection for those workers in terms of safety and health. A second step is to recognize that such workers are employees and to ensure that they have employment contracts.

In addition to transfer programmes, in several countries the consolidation of direct employment support and intermediation programmes to facilitate entry into the labour market, particularly for women, has played an important role. In this regard, formal jobs must be reactivated and created in the sectors that were severely affected, such as commerce, tourism and services, and measures must be implemented to revitalize economies and support a recovery in employment for women. In addition, in order to reduce gender gaps, women's inclusion and advancement in innovative sectors such as technology, energy and other emerging sectors should be promoted and gender barriers to employment should be eliminated (ECLAC, 2019b).

For young people, who suffered significant job losses, a decline in job quality and higher unemployment, the countries of the region used a mix of policies, including job training and skills building, tools that are key for an equitable recovery. Most of these programmes used cash transfers for participants and some also offered medical insurance. The combined use of active policies and income support in programmes to support young people is increasingly important in a context of limited work opportunities and as a means of helping those living in poverty (ILO, 2022; Salazar-Xirinachs, 2022a). Improving the working conditions of young people, most of whom work in the informal sector, is key to a transformative recovery with equality. With respect to this, adoption of comprehensive measures is proposed in at least three areas: (i) expanding the range of educational opportunities; (ii) broadening the capacity to create pathways toward decent work; and (iii) expanding social protection, including care policies (Abramo, 2021). The transition toward greener, digital economies also requires young people to acquire the appropriate technical and digital skills to enable them to take full advantage of new opportunities (ILO, 2022).

4. Closing the education gap that was exacerbated by the pandemic

In the region, the repercussions of the health crisis caused by the pandemic were multidimensional and laid bare the interdependence between health, society and the economy (ECLAC, 2022d). The crisis has had severe effects on people's well-being, with silent and devastating impacts on education, putting the future of an entire generation at risk. One of the first measures taken by countries to address the emergency and control the spread of the disease was to close schools, which interrupted face-to-face classes in almost all countries for extended periods. Latin America and the Caribbean is one of the regions of the world where this measure lasted the longest.

School closures will have long-term consequences for the acquisition of skills over the various stages of children's development and will affect other factors that are crucial for their well-being, such as nutrition, health and recreation (ECLAC, 2022b). The unexpected and abrupt transition to remote education in contexts with extremely varied connectivity, availability of devices and home learning conditions has increased inequality, bringing to light and widening existing education gaps. Access to education at all levels had significantly improved in recent decades. However, the rate of school access and school completion rate were showing signs of slowing and stalling before the pandemic, revealing the presence of exclusionary obstacles at the intersection of various axes of the social inequality matrix (UNESCO/UNICEF/ECLAC, 2022). Significant challenges also remain in terms of the quality of education provided and learning outcomes for the basic cognitive skills that are essential for full participation in today's complex societies.

The rapid transition from school to distance education channels using digital media and other available modes of connection was a paradigm shift, leading to innovations and providing lessons from experiences in adaptation and educational continuity. It is important to take stock of lessons learned and to shed light on and address the inequalities and debts that existed before the pandemic, which make it difficult to resume face-to-face education based on models similar to those of the past and also mean that education systems must be restructured to make them more resilient and inclusive.

Measures to restructure education systems to make them more inclusive and resilient must be coordinated with the proposals to transform education globally put forward at the Transforming Education Summit in 2022, the aim of which was to step up national and international efforts to meet the targets of Sustainable Development Goal 4 and transform education to overcome the key challenges of the modern

world. At the Summit, seven Global Initiative Calls to Action were launched,¹³ with a call to monitor progress on the initiatives through a small set of new indicators to be added to the list for Goal 4, linked to national targets for 2025 and 2030, to be assessed annually.

This crisis should be seen as an opportunity to take urgent action to renew and transform education systems (Huepe Palma and Trucco, 2022). First, it is essential to ensure that in-person learning continues and to recover lost learning through an inclusive approach. To this end, the socioemotional well-being of students and the wider education community in general must be addressed. It is also essential to implement assessment processes that are both diagnostic and formative, and to establish special support measures aimed at overcoming learning losses, such as tutoring in small groups during school or extracurricular periods, both in-person and online. Individual counselling or psychological support sessions to meet the socioemotional needs of certain students and pedagogical measures to support development of skills that contribute to faster learning, such as metacognition or collaborative learning, are also essential. It is also key to adopt specific measures aimed at students at higher risk of disengagement or dropping out. In addition, infrastructure and health protocols need to be strengthened to make schools safe places, given that the pandemic is not over.

Second, it is critical to address education inequalities and ensure the effective right to inclusive, quality education. In that regard, returning to in-person classes, increasing investment in education and reorganizing institutional conditions for inclusion are essential. In particular, measures must be implemented to ensure adequate schooling conditions for all children, adolescents and young people, in with a holistic approach to well-being and respect for their rights. This entails better coordination between education policies and policies on other areas of well-being, including those relating to social protection for students and their families, nutrition, the physical, social and emotional health of students, the economic well-being of households, protecting students from violence, labour, transport and care (Huepe, Palma and Trucco, 2022). Education issues are not solved only in the field of education.

Lastly, it is important to learn from recent experience. Distance education during the pandemic has provided lessons that should be systematized and can help to extend learning times and reduce gaps while also strengthening innovation (see box V.1). Over more than two years of this crisis, countries have made efforts and achieved significant progress in digital education, creating new opportunities (ECLAC, 2022b).

During the prolonged closure of educational institutions, several countries of the region implemented solutions to adapt their information systems and respond to the new data needs in the field of education. This involved increasing the frequency of data collection and adopting new remote methods for collecting and modifying data (UNESCO, 2021). The pandemic demonstrated the importance of integrated digital data systems for education management. In the learning recovery, data systems would benefit from greater use of digital technologies to detect and support students most at risk of dropping out of school (for example, by means of early warning systems that combine educational data with information from other sectors, such as social protection and health). Support and training for teachers must also be maintained to ensure that they continue using the digital skills and innovative pedagogical tools that gained traction during the crisis; these also serve to monitor teachers' learning and the evolution of their digital and pedagogical skills.

There is a need for granular and up-to-date assessments of the effects of the pandemic on the education community. It will also be necessary to ascertain the infrastructure and connectivity needs of schools and homes, and to evaluate the effectiveness of remote education strategies at the local level, in order to make education systems more resilient in case of future disruptions. Extended data collection would make it possible to inform national, intermediate and local stakeholders in a timely manner, and to optimize management, administration and planning in education and in educational institutions, as well as to contribute to the formulation, monitoring and evaluation of public policies in an ever changing and increasingly uncertain context (Huepe, Palma and Trucco, 2022).

¹³ The Calls to Action were: (i) greening education to get every learner climate-ready; (ii) connecting every child and young person to digital solutions; (iii) addressing the crisis in foundational learning among young learners; (iv) transforming education systems to enable all crisis-affected children and youth to access inclusive, quality, safe learning opportunities and continuity of education; (v) advancing gender equality and girls' and women's empowerment; (vi) transforming the financing of education by investing more, more equitably, more efficiently, more innovatively; and (vii) empowering young people to be effective leaders in reshaping education.

Box V.1

Learning through digital education during the pandemic: the case of the Ceibal Plan in Uruguay

The pandemic posed obstacles to the continuity of teaching and learning, but it also sparked innovation in the region's educational systems. Faced with the need to provide remote education, countries accelerated the use of digital technologies to this end, mainly to offer content, and invested in closing the digital connectivity divide (Huepe, Palma and Trucco, 2022).

Uruguay is an example of success in this regard because the response of its education systems was based on the progress already made through the Ceibal Plan, which had been launched in 2007. The Ceibal Plan had enabled the country to make great strides in digitalizing teaching and learning processes, giving a computer to every student and teacher in primary and lower secondary education (levels 1 and 2 of the International Standard Classification of Education (ISCED)), providing public schools with Internet connections and making pedagogical resources available to the educational community on its digital platform (Vincent-Lancrin, Cobo and Reimers, 2022).

During the pandemic, Uruguay rolled out the "Ceibal en Casa" plan, which meant shifting from a hybrid educational modality to fully remote education by means of technical and teaching innovations. These included a virtual classroom with synchronous and asynchronous learning modalities, teacher training in the use of the new functionalities, a virtual library with over 7,000 books, and virtual platforms for learning mathematics. The coverage of the Ceibal Plan increased significantly during the pandemic, from 42% in May 2019 to 85% in May 2020. In addition, there was a high degree of teacher satisfaction regarding platforms functionality: 93% of participating teachers reported having used these platforms to send assignments and evaluations, 87% to provide feedback and 59% to videoconference with other teachers (Vincent-Lancrin, Cobo and Reimers, 2022).

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of M. Huepe, A. Palma and D. Trucco, "Educación en tiempos de pandemia: una oportunidad para transformar los sistemas educativos en América Latina y el Caribe", *Social Policy series*, No. 243, Santiago, 2022; S. Vincent-Lancrin, C. Cobo Romaní and R. Reimers (eds.), *How Learning Continued during the COVID-19 Pandemic: Global Lessons from Initiatives to Support Learners and Teachers*, Paris, OECD Publishing, 2022.

The return to in-person learning must not mean a return to the pre-pandemic situation. Countries must take advantage of the opportunity and lessons learned from this experience to give fresh impetus to education. In this context, education must be a pillar of development, equality and participation in society, leaving no one behind. Education financing must be a priority in order to address historical debts in realizing the right to quality education, to respond to new needs linked to deepening inequalities in education systems in the wake of the pandemic, and to address uncertainty and rapid global changes, including technological change, the climate crisis and demographic pressures. The ways in which education strategies are implemented to recover from the crisis will determine the fate of a generation.

5. Guaranteeing the rights of particularly vulnerable populations

As discussed above, the costs of inequality—economic, social and environmental—have become unsustainable and it is necessary to rebuild with inclusion and sustainability, aiming for the creation of a true welfare state, which is long overdue in the region. This entails adoption of social public policies that are universal while also sensitive to differences. In particular, affirmative policies are needed to break down barriers to access for individuals and groups experiencing different forms of inequality, discrimination and exclusion (ECLAC, 2020d). These policies are central to reducing inequalities, advancing toward social and labour inclusion and make it possible to address the situations of a wide range of population groups, such as older persons, migrants, indigenous peoples and Afrodescendent populations (ECLAC, 2021c).

(a) Older persons

Latin America and the Caribbean is home to 89 million people aged 60 and over, 13.4% of the total population of the region. The number and proportion of older people in the region will increase rapidly: by 2030, they are projected to number 115 million, representing 16.5% of the population, and 188 million, or 25.1% of the population, by 2050.

The increased longevity of the population is an achievement, as shown by life expectancy trends. In 1950, the life expectancy at birth for both sexes in the region was only 48.6 years, while in 2022 it reached 73.8 years. This represents a 1.3-year decline with respect to the highest value reached in 2019, owing to the effects of the pandemic. Nonetheless, life expectancy at birth is projected to continue to increase, reaching close to 81 years by 2050 (United Nations, 2022).

However, ageing also presents significant public policy challenges, especially in terms of social protection, care and health. The increase in the proportion of older persons and the lengthening of the life cycle pose new challenges for ensuring the full and effective enjoyment of their rights.

In light of population ageing, structural challenges and the effects of the pandemic, efforts are needed to develop and consolidate an international system for the protection of the human rights of older persons that incorporates gender, intersectional and intercultural approaches into the design of public policies, programmes and measures. The countries of the region must continue to strengthen international cooperation mechanisms to achieve the goals of the Madrid International Plan of Action on Ageing, the Montevideo Consensus on Population and Development (ECLAC, 2013) and the United Nations Decade of Healthy Ageing (2021–2030) and to comply with the Inter-American Convention on Protecting the Human Rights of Older Persons.

In this context, it is vitally important to address the structural causes that are leaving many older persons behind, which requires the following:

- (i) Universalizing older persons' access to quality health services, with special emphasis on medical care, rehabilitation services, medicine distribution and primary care services; expanding the coverage of contributory and non-contributory pensions; providing comprehensive care services, in particular long-term care, that allow for the revalorization, redistribution and social reorganization of care, with an emphasis on decommodification and making care less dependent on family members; and ensuring that older people have access to basic services, including water, sanitation, clean and safe energy and information and communications technology (ICT).
- (ii) Advancing the inclusion of ageing in public and government agendas, by harmonizing laws, based on the Inter-American Convention on the Protection of the Human Rights of Older Persons; strengthening the institutions responsible for coordinating national policies on ageing; and including various stakeholders, such as civil society organizations and the academic and private sectors.
- (iii) Strengthening mechanisms for collecting sociodemographic data disaggregated by age, sex, ethnic and racial origin, morbidity and disability, which will provide data for the design of intersectional policies, programmes and actions that take into account the different realities of old age and ageing modalities. It is particularly important to raise awareness on the difficult living conditions of older women, older persons with different gender identities, older persons with disabilities, those belonging to indigenous and Afrodescendent populations and those who are more vulnerable for these or other reasons (ECLAC, 2022d).

(b) Migrants

The pandemic has disproportionately affected migrants, in particular migrant women and unaccompanied children. In the complex international migration scenario in Latin America and the Caribbean, which is characterized by an increase in irregular flows, it is imperative to save lives in border areas, combat trafficking in persons and restrict the use of detention as an administrative measure. It is crucial to strengthen international partnerships and coordination among States to promote safe, orderly and regular migration, bringing national migration control policies into line with international agreements, based on respect for the human rights of migrants. The objectives of the Global Compact for Safe, Orderly and Regular Migration, in conjunction with the Goals of the 2030 Agenda for Sustainable Development and the priority measures of the Montevideo Consensus, provide States with guidelines for including migrants in their societies and economies, and for promoting the human dignity and well-being of migrants in their processes of departure, entry, stay and return (ECLAC, 2022d).

Actions that need to be carried out jointly, pursuant to international agreements, include: (i) an increase in funds channelled to the communities that receive migrants and refugees and the organizations that work directly with them; (ii) consideration of measures other than the detention of migrants and refugees; and (iii) the temporary suspension of deportations (Brito, 2020). The potential role of civil society organizations also warrants consideration, especially when the militarization of borders has become a *de facto* form of migration management (Brumat and Finn, 2021; SJM, 2021).

The post-pandemic recovery should follow a dual path to take advantage of the contributions of migrants to sustainable development. First, to include migrants in the coverage of countries' health and social services, decisively and unconditionally; second, to recognize, encourage and increase their contribution to economic development. Both the Montevideo Consensus and the Global Compact for Safe, Orderly and Regular Migration urge States to redouble their efforts to regularize migratory flows and guarantee migrants' access to basic health coverage, appropriate housing conditions and opportunities for children and adolescents to continue attending school (see box V.2).

Box V.2

Colombia: temporary protection statute for Venezuelan migrants

Colombia is one of the main transit and destination countries for migrants in the region. In response to these migration flows, which in the case of Venezuelans exceed 1.8 million people, a temporary protection statute for Venezuelan migrants was enacted in 2021. The aim of this mechanism, which complements the international refugee protection regime, is to enable Venezuelan migrants in the country to move from a temporary protection system to a regular migration system. Those who have recourse to the measure will have 10 years to obtain a resident visa. It is aimed at Venezuelan nationals whose migration status in Colombia is regular, are seeking asylum or have requested a visa from the Ministry of Foreign Affairs, or those whose migration status is irregular but who can prove that they were in Colombia before 31 January 2021 or that they entered through a border control post between 31 January 2021 and 28 May 2023.

The statute has two components. The first is the Unified Register of Venezuelan Migrants (RUMV), launched on 28 April 2021, which involves online pre-registration, a socioeconomic survey and in-person biometric registration. The second is the Temporary Protection Permit (PPT), issued by the Special Administrative Unit of Migration Colombia, which is not equivalent to recognition of refugee status and does not imply granting of asylum. This permit is only valid while the statute is in force and is not renewable; in addition, receipt by Venezuelan migrants of any type of visa from the Ministry of Foreign Affairs will result in revocation of the Temporary Protection Permit. As of 4 October 2022, there were 2,462,842 people in the Unified Register, with 2,343,207 having completed the socioeconomic survey and 1,948,124 registered biometrically. In addition, 1,590,970 Temporary Protection Permits had been approved, 1,539,609 of which had been printed and 1,452,020 delivered.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Government of Colombia, "Actualización examen voluntario del Pacto Mundial para la Migración - Colombia" [online] <https://www.un.org/sites/un2.un.org/files/imrf-colombia.pdf> and Migración Colombia, "Visibles", Ministry of Foreign Affairs [online] <https://www.migracioncolombia.gov.co/visibles>.

For migrants and refugees to achieve full socioeconomic integration in destination communities, dialogue is needed between stakeholders, including migrant organizations, employers' associations, the government and civil society organizations. During the pandemic, examples of good practice included exceptions made to border closures for workers in agricultural activities considered essential, and the possibility of humanitarian transit for migrants and asylum-seekers. Similarly, bilateral cooperation is needed between countries of origin and destination, in terms of social welfare and the recognition of skills (Carella, Freañ and Velasco, 2021). These experiences reveal a spirit of respect for the rights of migrants and asylum-seekers (ECLAC, 2022d).

(c) Recognizing the rights of indigenous peoples' and Afrodescendants' and reducing the structural inequality they face

The social, economic and health crisis triggered by the pandemic has exacerbated the structural problems that were already affecting the 58.2 million indigenous people and 134 million Afrodescendants in the region. Although the effects of the crisis on these population groups cannot yet be fully assessed, it is clear that they are among the most vulnerable, so efforts must be redoubled to overcome the lack of progress or gaps in their social and economic inclusion. To this end, it is vital to implement the provisions of the United Nations Declaration on the Rights of Indigenous Peoples, as well as those of the ILO Indigenous and Tribal Peoples Convention, 1989 (No. 169), and to fulfil the commitments made in the Durban Declaration and Programme of Action adopted at the World Conference against Racism, Racial Discrimination, Xenophobia and Related Intolerance (Durban, 2001).

In terms of individual rights, countries must ensure that the economic and social measures put in place as part of the response to the pandemic and the effects of the war in Ukraine address the needs of the Afrodescendent and indigenous populations. Affirmative actions and universal policies for social protection, health, education and the promotion of decent work should be implemented to eradicate the discrimination affecting these groups and reduce historical inequalities.

As regards the collective rights of indigenous peoples and Afrodescendent communities, evaluation of existing regulatory frameworks must be carried out in cooperation with these peoples, to identify any gaps with respect to the standards established in international instruments and in the jurisprudence of the Inter-American human rights system and implement the relevant reforms needed. At the same time, there is a need to strengthen — or create, where necessary— permanent and institutionalized mechanisms to enable indigenous and Afrodescendent peoples to participate and be represented in the State agencies leading the economic recovery from the pandemic, drawing on the lessons learned from the autonomous measures that these groups implemented during the emergency.

Considering that the region is home to more than 800 distinct indigenous peoples with significant demographic, social, cultural and territorial differences —which is also true of Afrodescendent populations— concrete economic recovery strategies and their respective budget allocations must be defined, implemented and evaluated. These should respond to the interests of communities living in traditional territories and those in urban areas alike, ensuring that the principle of free, prior and informed consent is always respected.

It is also necessary to align economic recovery goals and targets with those related to the mitigation of climate change and its effects, giving central importance to the territorial rights of indigenous peoples, whose autonomous control over their lands contributes significantly to local, regional and national ecosystem services. Given that indigenous lands are the foundation of their people's economies and survival strategies, action must be taken for the demarcation, titling and regulation of these lands, which has fallen behind as a result of the pandemic. It is matter of urgency to ensure peace and security in the territories of indigenous peoples, as a condition for advancing toward a transformative economic recovery.

Lastly, there is a need to raise the statistical visibility of indigenous and Afrodescendent peoples, by enhancing their identification in the different data sources and producing disaggregated, timely and quality information that allows for a better understanding of their living conditions and the exercise of their rights. To this end, attention should be paid to current standards and recommendations including ensuring effective participation of indigenous peoples and Afrodescendants in these statistical processes and especially in the 2020 round of population and housing censuses (ECLAC, 2022d).

E. Care systems: a pillar of rights-based welfare states

The care society as a horizon for the shift toward sustainable growth with equality, is the way to reduce —in synergy with the economic and environmental dimensions— social and gender inequality, counter the increasing precariousness of care and highlight the multiplier effects of the care economy, as discussed in chapter IV.

Although recognizing and valuing unpaid care and domestic work, as set out in target 5.4 of the Sustainable Development Goals, has been a milestone in global commitments toward the achievement of sustainable development, more must be done to acknowledge the central role of care work in economic transformation and as a key element of a new development model.¹⁴

Shoring up welfare systems is a crucial step on the path to a care society.¹⁵ It is therefore essential to create and strengthen comprehensive care systems that are gender-sensitive, universal and progressive, and which encompass co-responsibility, financial sustainability and the components of social protection, as agreed by the governments of the region in the Regional Gender Agenda (ECLAC, 2021d). Broad, participatory, comprehensive, inclusive and transformative agreements must also be forged to distribute the benefits of progress and help to overcome the structural challenges of inequality.

1. A State for a care society

The right to care is universal, indivisible and must be ensured for all people throughout their lives, without discrimination, and interdependently with other rights and social and environmental relationships. It therefore calls for an intercultural and intersectional approach that frames it within the cultural visions and concepts of well-being and development of various population groups.

In order to ensure the right to care, States must build their coordination and regulatory capacities for efficient public policy management, preventing segmentation in access to care services and safeguarding the quality thereof. Because care affects many other social and economic spheres and can play an important role in gender inequality, public interventions in this area require an intersectoral approach and coordination between different levels of government (local, subnational and national) and State agencies. The governance of care policies can be concentrated at the highest levels of government in coordination with territorial authorities.¹⁶ In addition, the governing bodies responsible for care policies can be also spaces for decision-making and advocacy in public policy or be focused on policy management. Policies are thus improved, bearing greater social legitimacy and transparency, and engage the organizations and people working in this sector.

The State's role in the supervision and regulation of care services and policies is also central to the promotion of universal, progressive systems, broad coverage and quality. The State has an oversight and regulatory function with respect to care providers (market, households, community) and must uphold the rights and responsibilities of institutions. It must also ensure the quality of goods, services and infrastructure (spaces, materials) for the provision of by care providers, and establish the accreditation and certification criteria for the organizations concerned and the substantive standards for the quality of services provided (ECLAC, 2022b). In addition, States' capacity to provide, manage, regulate and control care services is key to building well-coordinated and efficient care systems and policies whose cross-cutting, intersectoral and transformative nature require broad agreements across the various dimensions to be put into practice.

2. Public policies for a care society

Strengthening social protection and the role of the State as a duty bearer with regard to rights, with a gender perspective and a focus on care, entails shoring up the sectoral components of social protection most directly related to care issues. It also involves creating and consolidating comprehensive care policies and systems that aim to be progressive and universal—with an intersectional approach—that are co-responsible and sustainable and are coordinated with other pillars of social protection.

¹⁴ See, among others, ECLAC (2021d and 2022b), United Nations (2021), ECLAC/UN-Women (2020) and ILO (2019).

¹⁵ Care encompasses all activities essential to people's lives and to their physical and emotional well-being. Care work can be unpaid, such as the work performed in people's homes, or paid, in which case it makes up part of the labour market.

¹⁶ Care policy includes the creation of comprehensive systems, plans and programmes aimed at recognizing, redistributing and reducing unpaid care work performed in the home. There are various forms of public interventions, including the provision of services, social benefits and cash transfers, insurance, infrastructure enhancement, creation of laws, regulatory reforms and regulations such as those governing employment, quality of services or fee scales for the provision of care, among others.

The active role of the State in design and implementation of care policies can increase efficiency of provision of welfare. Formulation and strengthening of these policies affect access to and quality of employment, as well as access to and coverage of social security—especially for women— population health, labour regulations, and school attendance and dropout rates, especially for girls and adolescent girls. The design of care policies, in turn, is dependent on the characteristics of other components of social protection. Protection systems with low levels of health coverage, high levels of labour informality, highly commercialized education and health systems, or significant gender gaps in employment significantly undermine the implementation of comprehensive and quality care policies and systems. In this regard, the complex and interlinked nature of care calls for a comprehensive, intersectoral and inter-institutional approach, to ensure that it is managed in an efficient and coordinated manner.

For example, in the workplace, care policies range from services such as breastfeeding rooms to “time policies” such as maternity, paternity or parental leave, or leave for workers with general family responsibilities, and flexible or part-time working arrangements for caregiving parents. The design of care policies should include rules on paid working time for prenatal check-ups and maternal health care. Labour and social security systems that allow additional years for caregiving—or include other affirmative mechanisms—are also worthy of mention. Examples of gender-sensitive labour market policies that put care at the centre of development include wage, contract and promotion systems that take into account the care responsibilities of all workers. Equally important are employment policies that aimed to improve the collective and individual rights of workers in the care sector.

Improved health policy has a direct impact on care. The pandemic made it clear that the social, health, economic and environmental dimensions are closely interconnected and require comprehensive approaches (Cid and Marinho, 2022). Low wages, excessive workloads, long working hours and unequal access to health services are structural obstacles in the region that were accentuated during the pandemic. Working conditions, wages and education levels of health-care workers affect the availability and quality of care. Health-care infrastructure and personnel must therefore be properly organized and distributed, especially in rural areas and areas with insufficient access to services. Staff must also have the necessary supplies to carry out their work and be trained to perform in different sociocultural and economic contexts and with different environmental risks. In addition, measures are needed to combat the horizontal and vertical gender segregation characteristic of this sector. This segregation means that although women account for the vast majority of people employed in the sector, they frequently work in the most precarious segments and under worse conditions (ECLAC, 2021e).

In addition to gender-sensitive sectoral actions and policies on the redistribution, recognition and revaluation of care (Elson, 2017), it is also crucial to step up efforts to create comprehensive care systems. Care policy must have an impact on distribution of care work between men and women (gender co-responsibility), and among the State, the market, households and the community (social co-responsibility). Care systems must be based on criteria of universality and progressiveness. While the aim should be for policy to be universal, structural inequalities affect the care needs of different populations. In particular, people in situations of permanent or temporary dependency (persons with disabilities, children, and older persons) and caregivers (paid and unpaid) should be priority populations when establishing mechanisms for progressive access to care policies.

Care systems must have sufficient, non-transferable and sustainable resources. Given the tensions and restrictions on the availability of fiscal resources, care systems tend to focus on cash transfers that target people in situations of severe dependency. However, such policies must be accompanied by progressive criteria aimed at strengthening care services, without which substantial defamilialization of care will not be possible, thus undermining the goal of equality and autonomy for women. It is also vital to boost the transformative potential of the care economy as a key element of development with equality. The approach to care must go beyond a purely expenditure-based conception, viewing it instead as an investment in present and future capabilities and in job creation, particularly for women.

Progress in the production of statistics and indicators related to gender equality, care, climate change and environmental degradation is crucial to improving policy design and implementation. Because the social organization of care varies depending on sociocultural, economic and territorial contexts, the design and implementation of policies should draw on georeferencing studies of potential demand and the existing range of services.

Measures taken must include building and strengthening infrastructure. Also essential are gender-sensitive planning and mobility criteria that take into account the effects of the organization of public space on care and that allow the population to move around and participate in the different social, cultural and economic spheres of cities, according to their capacities (see box V.3).

Box V.3

A territorial and gender approach to care systems: the case of the district care system of Bogotá

A territorial approach to care policies takes into account the specific socioeconomic, demographic and geospatial characteristics of territories, and considers other interventions that are conducted on a territorial basis, ensuring that they are aligned. Accordingly, the District Women's Secretariat of the Office of the Mayor of Bogotá, working with ECLAC, established a series of technical criteria and indicators from a gender perspective to design and implement the district care system using a territorial approach.

Indicators were designed to define both the supply of care services (public and private) and the existing demand for care (older persons, early childhood, dependent population and care workers), based on the characteristics of the city and the contents of the District Development Plan 2020–2024 and the Bogotá Land Use Plan. Using these indicators, a georeferenced map was created, complemented by interviews with authorities and technical staff of the district secretariats involved in the management and implementation of care services.

This information served as the main input in establishing the criteria for planning and prioritizing which care services and care policies are implemented in the area. The care map also enables people to gain greater knowledge of the care services available in each part of the city. The map is a key element for optimizing public management, as it provides the information needed (schedules, location, type of service and responsible service provider) to foster coordination between the public institutions involved in providing these services, which leads to greater efficiency and effectiveness in the use of State resources.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Gender Equality Observatory for Latin America and the Caribbean [online] <https://geo.cepal.org/geo-dag-bogota/> and District Care System (SIDICU), "Manzanas del Cuidado" [online] <https://sistemadecuidado.gov.co/manzanasdelcuidado/index.html>.

Given that the burden of unpaid work is larger in households with poor infrastructure (housing, sanitation or access to energy), States should bolster subsidies or cash transfers aimed at meeting the specific housing requirements of people requiring care; such measures would improve their socioeconomic and labour inclusion, and their autonomy. In addition to fostering and facilitating access to basic services and housing conditions adapted to their needs, States can provide other care services for households, such as food preparation and school assistance, telecare¹⁷ and home support services. Care policies may also encompass subsidies or cash transfers for workers with dependents, and tax allowances relating to care.

Likewise, care policies can provide access to goods, services or financial allowances that promote social and gender co-responsibility in care. In this regard, it is essential to enhance and expand out-of-home care services, such as early learning and childcare centres, care centres for dependent older persons and persons with disabilities, and long-stay or temporary care centres for the permanently or temporarily dependent. These services foster the autonomy of people requiring care and can provide placement in good-quality facilities for relatively long stays. They also lighten the financial and emotional burden for families and increase women's autonomy by transferring part of caregiving outside the family.

Care centres can, depending on the requirements of the target population and the setting, provide not only preventive social and health care and stimulation for the day-to-day activities of people requiring care, but also support for family or household members. In this regard, rest and leisure services for caregivers have a direct impact on their performance and workload and on their overall quality of life, by reducing the stress caused by the emotional burden and working conditions that characterize the sector. For care policy to be systemic and non-fragmented, a governance system is needed that interlinks the different components and defines their competencies and goals, with a view to achieving shared aims.

¹⁷ Telecare services can provide an immediate response in an emergency and can be available 24 hours a day. Examples include emergency hotlines, personal alarms, medication managers, panic buttons, and temperature and smoke detectors.

3. Participatory, inclusive and transformative compacts for a care society

ECLAC has issued a call to quicken the pace of progress toward economic, environmental and gender justice, and move toward a care society that prioritizes the sustainability of life and the planet, ensures the rights of people requiring and providing care, considers self-care; counteracts job insecurity in the care economy, and raises awareness of its multiplier effects. The promotion of gender equality policies, universal access to social protection, the creation and strengthening of care systems, sustainable management of natural resources, and increased and more diversified public and private investment in care will only be possible through consensus-based and participatory action based on development compacts (ECLAC, 2020a). These compacts should combat structural inequalities at the regional level and lay the foundations for a care society.

First, as discussed in the section on macroeconomic policy, fiscal covenants are needed to expand fiscal space and foster progressive taxation that supports social investment for quality public services to ensure women's rights, implement comprehensive, sustainable, resilient universal social protection systems and ensure the financial sustainability of policies. In this respect, structural problems need to be addressed, including low levels of tax collection, high rates of tax evasion and avoidance and regressive tax structures that disproportionately burden women. These problems affect funding for the care that is increasingly necessary and further deepen gender inequalities, hampering implementation of the Regional Gender Agenda and the 2030 Agenda for Sustainable Development. A new fiscal covenant should foster the transformative and energizing potential of the care economy. Investment in care would help to break the vicious circle of poverty, generate greater autonomy for women and stimulate interrelated economic sectors, financing the initial investment through higher tax revenues.

Second, action and policies must be implemented in the area of social protection to address changes in the world of work. The effects of technological changes, particularly in terms of digitalization, accelerated during the pandemic. The combined impact of poverty, the digital divide and gender inequality limits opportunities and increases inequalities that originate from technical progress (Vaca-Trigo and Valenzuela, 2022). It is therefore vital to forge a compact for development focused on inclusive digital transformation and on implementing a basic digital basket that builds the capacities needed to use these technologies (ECLAC, 2020e), recognizing the requirement of such skills for full participation in education and paid work. The universalization of access to digital goods and services should prioritize population groups, the majority of whom are women, without Internet connections or whose income is insufficient to afford Internet access and digital devices.

Lastly, a gender-sensitive environmental compact that takes into account the differential effects of disasters and climate change must be reached. Social protection must be provided in the face of disasters and climate change to prevent or address economic impact, especially for the most vulnerable or those in the most precarious circumstances. In this regard, it is crucial to pursue strategies that foster access to basic services such as water, improve access to housing, create incentives for labour reintegration, create lines of financing for MSMEs or expand existing lines, and implement non-contributory transfers, especially for the most economically vulnerable, many of whom are women.

The complementarity between the strengthening of care policies and the new fiscal covenants and social and environmental compacts proposed in this section and elsewhere in this document will enable progress along the path to a care society. This is the only way to ensure that the right to care is exercised for all.

F. Mitigation and adaptation to the environmental emergency

1. A change in relative returns

The transition toward a low-carbon economy will not be a spontaneous outcome of the institutional and social frameworks that determine the operating rules of the global economy. The path forward entails redirecting incentives to shift the low- and high-carbon investments in favour of the former and bearing some private

costs —such as infrastructure investment or research and development— and social costs —such as those related to a just transition or compensation for the removal of environmentally harmful subsidies. This concerted effort should be deliberate, coordinated and coherent; it is a task that governments alone can perform, within an international framework of shared values for this new orientation (Bárcena and others, 2020; ECLAC, 2020a). As argued in the first section of this chapter, the realities of the region place limits on the actions that can be taken to achieve progress in certain policy areas while also opening up opportunities in others, such as those discussed in chapter IV.

Given the relatively clean energy mix in the region, albeit with substantial differences among countries, as seen in section A of chapter IV, higher international energy prices should increase the share of renewably-sourced energy for domestic use. This entails changes to the investment structure, largely based on relative returns, and therefore on an efficient combination of regulatory, fiscal and financial signals.

(a) Regulation

Adequate regulation strengthens the legal framework and provides legal certainty for transformative sectors. Recommended regulations include those that open up the economy to the value chains of zero-emission vehicles, recycled materials or production and consumption of green hydrogen and those to bridge the gap in quality housing. This requires business models that make private investment viable thanks to legal certainty.

Through regulation, the internalization of externalities can shift the relative returns of declining production patterns toward emerging sectors. Accordingly, there is a need for regulatory frameworks that support production in new lines of business, a gradual increase in the requirement for domestic components in emerging value chains, tenders that facilitate producers' access to financing and certainty that the demand will be there for alternative production.¹⁸ Procedural regulatory measures are also important. In this regard, in the region, the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú Agreement) is a significant achievement.

(b) Fiscal measures

(i) Phasing out fossil fuel subsidies

The pandemic and the war between the Russian Federation and Ukraine have reinvigorated dependency on fossil fuels, whose use is incompatible with climate commitments. Notable investments have been made in fossil fuel-based sectors with a high environmental footprint, such as private transportation and energy, which have often been accompanied by subsidies to offset rising energy prices. In the countries of the Group of 20 (G20), fossil fuel consumption and production subsidies rose from US\$ 147 billion in 2020 to US\$ 190 billion in 2021, an increase of around 30% (OECD, 2022).

The phasing out of fossil fuel subsidies along with the appropriate mitigation or compensation measures for the most economically vulnerable sectors could open up fiscal space for the remaining funding to be used to support sectors such as electrified public transportation, renewable energy, or others that can contribute significantly to achievement of the 2030 Agenda (ECLAC, 2022e). The promotion of such sectors is at the heart of the most recently implemented legislation in developed countries like the United States.

(ii) Gradually raising tax on carbon dioxide, methane and other pollutants or substances harmful to health

Environmental taxes are a strong signal of a change in relative returns and also enable the expansion of fiscal space. The internalization of negative externalities imposes costs on those that generate them: this

¹⁸ These activities include: (i) production and conversion of electric vehicles; (ii) expansion of the transmission network for renewable energy; (iii) domestic applications for hydrogen power; (iv) recycling operations and design requirements based on the circular economy; (v) recycling of urban land for higher urban population density; and (vi) national provision of environmental services such as carbon capture. Many of these activities are discussed in chapter IV.

happens, for example, when fines for polluting are raised or when investments in assets, such as fossil fuel deposits or inefficient fossil fuel-powered vehicles, lose value. These additional costs generate resistance to reform by powerful actors in the economy and in society. Carbon taxes increase tax revenues while providing a signal to reduce the activities that generate pollutants, such as burning fossil fuels. This effect becomes more powerful when the tax rate is steadily raised in order to incentivize cleaner investment, which increases certainty regarding the growing viability of low-carbon investments. Defining a road map for a progressive (gradual) increase is a more effective instrument than using economic policy to achieve a specific tax revenue goal, which is usually difficult.

Depending on the country, these taxes are highly progressive when applied to fuel consumption or directly to vehicle ownership; however, it is important to mitigate the secondary distributive effects of these measures, which can result in setbacks because of repercussions for public transportation or electricity consumption. Some of the tax revenue obtained using these instruments, for example revenue from subsidy reductions, should therefore be allocated to compensation for the most vulnerable groups.

(iii) Applying environmental criteria to investments, for example by analysing climate variable-related financial risk, including the social cost of emitting carbon, applying differentiated discount rates and creating green finance taxonomies, to promote low-carbon investment

Introducing climate change considerations into the evaluation of public and private investments can promote projects with environmental benefits. For example, the use of lower and differentiated discount rates to benefit projects that have environmental advantages will enable these projects, whose maturity takes longer and whose social benefits are seen over a longer term, to compete with projects that have higher rates of return, but also greater negative externalities that are not part of the accounting during project assessments. Unlike tax-related measures, the inclusion of the social cost of carbon and of other damage to the environment and health in the systems used to evaluate public investments¹⁹ will affect profitability to the benefit of projects that have fewer negative externalities, distributing the cost or benefit differentials over the useful life of the project.

(c) Financial measures

The transition toward development that is more sustainable should go beyond the limited sources of public financing and mobilize private financing through multilateral or national development banks in accordance with their various mechanisms; for example, through a regulatory decision, such as channelling a portion of their financing toward investments that promote low-carbon and climate-resilient growth. This has become common practice for the Andean Development Corporation (CAF), the Inter-American Development Bank (IDB), the World Bank and other multilateral banks, although not for national development banks.²⁰

Financial sector actions can be key for shifting relative returns toward sustainable investment (Bárcena and others, 2020). The financial system should take into account climate damage and risks, which have not yet been assigned a market value, and acknowledge the contributions and reduced risks that climate-positive investments entail. Progress can be made toward gradually decreasing the relative returns of high-carbon investments compared to alternative, lower-carbon investments through a mix of measures, including: (i) internalizing physical risks and the risks of the climate change transition; (ii) introducing a social price on carbon; (iii) setting differentiated discount rates; (iv) diversifying the guarantees for such projects; (v) determining minimum technological requirements, for example, refusing to accept certain technologies for public transportation vehicles; and (vi) promoting certain operating techniques, such as the use of nature-based solutions combined with engineering solutions for certain types of projects.

Domestic and international development banks provide important financing, but it is insufficient. In light of the insufficiency of multilateral climate funds, funding from commercial private banks and the bond market should be stepped up. In fact, issuance of green or environmental bonds covers an increasing proportion of

¹⁹ These goals have led to animated discussion over how to classify or create a taxonomy for investments in climate adaptation or mitigation.

²⁰ Climate finance flows in Latin America and the Caribbean amount to around US\$ 20 billion per year (Samaniego and Schneider, 2019). These flows need to be five to ten times higher in order to reach climate goals (IPCC, 2022).

climate finance in the region (ECLAC, 2022e). The regional market for green bonds amounted to US\$ 21.6 billion between 2014 and 2020. In 2020, green bond issues were up 61% on the previous year, mainly driven by public sector bonds. In 2020, energy and transport together represented 79% of all green bond allocations, which were used for renewable energy and sustainable mobility projects.²¹ As illustrated in box V.4, thematic sovereign bonds have proved to be an effective financing instrument.

Box V.4

Thematic sovereign bonds: the case of Chile

Environmental, social and governance (ESG) bonds have proven to be an effective financing instrument for promoting financing for specific initiatives geared toward sustainable development. Chile's first green bond, issued in 2019 for US\$ 2 billion, represented 22% of that year's bond issuance. Between 2019 and 2022, green and sustainable bonds amounted to a cumulative figure of US\$ 13 billion and, in 2022, the share of thematic bonds accounted for 50% of sovereign bonds. Chile's Sustainable Bond Framework establishes eligible expenditures, which include those going toward clean transportation, renewable energy, energy efficiency, biodiversity conservation, efficient and climate-resilient management of water resources, and green buildings.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Ministry of Finance, "Bonos SLB" [online] <https://www.hacienda.cl/areas-de-trabajo/finanzas-internacionales/oficina-de-la-deuda-publica/bonos-esg/bonos-slb>.

Redirecting financial flows toward transformative sectors requires not only a change in the aims of financial institutions but also that they quantify the investment gap in sectors that are key to meeting national climate goals. It therefore also entails the scoping of national goals or targets for change.

2. Strengthening environmental democracy

Making progress toward sustainable development requires structural change that is supported by long-term policies. Continuity in policy and systems of incentives and disincentives requires both global and local sociopolitical agreements on sustainability, which are easier to reach in peaceful, just and inclusive societies. The rule of law, trust in robust institutions, and societies that are informed, participatory and engaged in the decisions that affect their surroundings and future contribute to better environmental and economic performance, facilitate needed transformations and prevent conflicts. Reducing institutional fragility also drives technology uptake and readiness in sectors that are key for sustainable development.

The General Assembly of the United Nations, in its resolution 76/300, adopted on 28 July 2022, recognized access to a clean, healthy and sustainable environment as a human right. This is necessary for the effective enjoyment of all human rights, and entails recognizing the effects of environmental crises, fulfilling the obligation to prevent such crises, and acknowledging the link between environmental protection and safeguarding human rights.²² The right to a healthy environment is therefore a catalyst for action on sustainable development.

The link between sustainable development, the right to a healthy environment, building fair, informed and participatory societies and strengthening institutions and the rule of law is acknowledged and promoted in the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú Agreement). The Agreement, which has been in force since 22 April 2021, has 13 States parties and 24 signatories, and emphasizes democratic principles that are essential for progress in sustainable development policies. Its positivity, grounded in capacity-building and cooperation between the countries of the region, is a tool that will be ever more powerful as more countries join in this common effort.

²¹ These bonds are sovereign, corporate or bank-issued fixed-income securities that raise private funds for investment in projects or activities with environmental sustainability objectives. They are structured in a similar way to standard bonds in terms of seniority, rating, compliance with conditions and pricing. In addition, bonds that contribute to the SDGs or to sustainable development or that are tied to environmental safeguards support economic actors in familiarizing themselves with financial instruments and national and international low-carbon funds.

²² See General Assembly resolution 76/300 "The human right to a clean, healthy and sustainable environment".

G. New approaches to natural resource governance

The region has large endowments of biological and other natural resources, whose management does not adequately contribute to inclusive and sustainable development. It is therefore key to change the governance of these resources so that they can contribute to the transition to a new development model. The competitive advantage of having a large endowment of natural resources should not mean extracting them until they are exhausted or requiring a higher ecological footprint in order to take advantage of them.

Natural resources can and should play a key role in the big push for sustainability, the inclusive transformation of productive structures and the transition toward more innovative, efficient and sustainable economic activity (Samaniego, Sánchez and Alatorre, 2022). This can be achieved both through a process to industrialize these resources and by channelling tax revenues and foreign currency earnings from their export into diversifying production and sectors that are more knowledge- and technology-intensive, while respecting the limits of natural heritage and critical ecosystem services (Sánchez and others, 2017). Natural resources are not, nor should they be, a curse, and they should help to overcome the reliance on extraction that is predominant in several countries of the region. Moreover, access to these resources, including basic water, sanitation, electricity and ecosystem services, contributes to reducing poverty and inequality.

Natural resource extraction, mainly of non-renewable resources, has led to increasing conflict in the region. For that reason, appropriate governance is needed, not only to address the goals and proposals of communities and other stakeholders, but also to promote better distribution of the costs and profits of extraction. In light of the climate emergency, extraction must be managed in a manner that is more environmentally efficient and leads to the progressive decoupling (absolute and relative) of the economy from materials, water, energy and pollution.

1. Strategic transitions in natural resource governance

The region must make strategic transitions in the governance of natural resources to enable those resources to contribute to sustainable structural change. Possible measures include the following:

- Making meaningful progress in the energy transition to renewable energies and universalization of electricity coverage. Renewable energy is a pillar for transforming production and creating green jobs and income. It can also support efforts to strengthen energy security and regional integration. To achieve this, public resources, financing and consistent regulation are needed, in a measure that is sufficient to enable policymakers along the entire value chain to move in the right direction.
- Fostering a water transition and overcoming limitations of water governance from watersheds through to water use in specific sectors. Human consumption and universal access to clean water and sanitation should be prioritized, improving water-use efficiency, with a view to reducing the ecological footprint and managing this resource in a more circular manner. To this end, the weak and scattered institutional water management frameworks need to be organized, building effective governance and improving management of rates and regulations, taking into account issues linked to the distributive effects of rates in guaranteeing access for the most vulnerable and incentives to promote more sustainable habits among all users.
- Promoting a transition to sustainable and ecosystemic productive use of biodiversity that recognizes its value in reproduction of life and enhances its contribution to the development of a sustainable bioeconomy in a region as biodiverse as Latin America and the Caribbean.
- Promoting an agroecological transition, as part of the promotion of the bioeconomy, that will make it possible to move toward an innovative, sustainable agriculture that is resilient to climate change and external shocks, in order to support fossil fuel decarbonization, enabling the inclusion of all

stakeholders and populations in the rural sector, prioritizing the region's food security and enhancing its potential as a food exporter to the world, while respecting the natural heritage and preserving critical ecosystem services.

As discussed in chapter IV, section D, biological resources: (i) are the basis for the development of new productive activities and value chains that are knowledge-intensive and in which new technologies are applied; (ii) enable bioindustrialization, through the production of goods and services that are located in rapidly expanding market segments with high value added; and (iii) offer opportunities for new activities to increase production and employment, since many of them are based on the use of living resources with territorial specificities, which provide alternatives for productive diversification and value-added in rural areas, especially in the agricultural and agro-industrial sectors. To fully take advantage of the potential of the bioeconomy, holistic policy approaches are needed along with coordinated incentives and investment (Rodríguez, Rodrigues and Sotomayor, 2019).

2. Fiscal and sectoral policies for transition

In addition to effective and suitable governance, transition in the non-renewable and extractive resources sector requires specific fiscal and sectoral policies (León, Muñoz and Sánchez, 2020).

Policies for the transition to a use of extractive resources that meets the needs of sustainable development must focus on more socially and environmentally sustainable production. Such policies should favour local chains and scaling up to products with higher value-added and technological intensity in the global value chains in which these extractive resources are key inputs, prioritizing energy and commodity security, and contributing to new pattern of industrial development based on faster-growing and sustainable market niches. In both the mining and hydrocarbon sectors, it is important to minimize environmental and social impacts and use materials, energy and water more efficiently. The participation of affected communities and information transparency are both crucial throughout the resource cycle. As seen in the previous section, ECLAC has championed the Escazú Agreement to guarantee access of communities and environmental defenders to information and justice, as this type of activity has given rise to socioenvironmental conflicts that, in some cases, turned violent.

In countries where non-renewable resource extraction is highly important in economic terms, governance must be improved to reduce dependence on the related foreign currency and tax revenue and to avoid creating and perpetuating industry lobbies and barriers (perverse incentives) that make structural change difficult and magnify the vicious circle (lock-in effect) in the economies. Since those countries, as commodity exporters, are price-takers and are exposed to international market fluctuations, they need suitable macroeconomic stabilization mechanisms and active countercyclical fiscal policies (Jorratt, 2021; Muinelo Gallo, 2022). In particular, countries that produce and export non-renewable natural resources should take into account the following guidelines when formulating fiscal policy:

- Adapt extractive activity tax regimes to achieve greater transparency and economic rent capture, taking into consideration progressiveness, efficiency and fairness in the framework of regional coordination agreements between countries that exploit non-renewable resources, to avoid tax regime competition that would fuel a race to the bottom.
- Eliminate opportunities for tax evasion and avoidance in international commodity trade, such as underinvoicing of exports through abuse of transfer pricing rules or filing incorrect customs declarations. In that regard, there is a need to adapt taxation instruments and procedures to include benchmark prices and strengthen tax and customs administrations to enable them to perform their inspection tasks more effectively.
- Ensure better distribution and use of economic rents from extractive activities in order to promote and channel State investment toward technological and production capacity, and transform natural capital into other forms of assets, such as science, technology, innovation or infrastructure.

Lastly, in situation such as the current one, public policies should be applied to reduce both the impact of the energy crisis and vulnerability to external shocks, in particular the following:

- Adopt measures to alleviate the impact of higher energy and fuel prices on the poorest and most vulnerable households by providing vouchers or direct cash transfers.
- Create, review and strengthen funds and other fuel price stabilization mechanisms to cushion exceptional increases in international prices and ensure that they are gradually passed on to the population and the productive sectors focused on the domestic market.
- Promote economic diversification and value-added in regional natural resource production chains to reduce their vulnerability to external shocks and to avoid amplifying the region's specialization in extraction for export.
- Create regional coordination mechanisms to address external shocks and energy crises so that the economies of the region can present integrated responses and positions.

H. Implementing industrial and technological policies

1. Extending the scope of industrial policy

To overcome the new challenges it faces, Latin America and the Caribbean must move toward a new industrial policy approach that broadens both its aims and its mechanisms and instruments for action, while strengthening the institutional framework that supports it. The scope of industrial policy must be expanded —as it has traditionally been limited to sectoral transformation— including planned alignment with national goals and support to overcome strategic challenges.

Traditionally, the main objective of industrial policy has been to intervene actively and deliberately to drive relevant changes in countries' production structures. The underlying premise of this approach is that, without such intervention and in the absence of any external stimulus, the countries of the region will tend to maintain production structures or make only gradual changes, out of inertia or by going with the tide, which will continue to strengthen low-technology, low-productivity sectors that have little international trade growth potential or that are mainly natural resource-intensive.

This set of aims has been expanded to include new challenges. The limitations of the current development model need to be remedied by creating a new model based on a welfare state, technological change and the transformation of production, while factoring in care for the environment and strengthening social inclusion. This transformation requires the coordination of new policies through a big push for sustainability, in which industrial policy plays a key role (ECLAC, 2020a). In chapter IV, these policies are analysed in the context of nine sectors that can drive this big push and specific actions are proposed to develop and strengthen them.

In addition, as discussed in chapter II, there has been substantial renewed worldwide interest —especially in developed countries— in industrial policies to guarantee supply of selected essential or strategic goods or services such as medicines and vaccines, food and energy, initially because of the repercussions of the pandemic and more recently because of the crisis caused by the war in Ukraine. Industrial policy is therefore considered an instrument that contributes to national strategic objectives, including those related to national security, through the development or strengthening of activities or sectors to generate a certain level of autonomy or sovereignty and improve resilience to future international trade disruptions.

Given the magnitude of the efforts needed to achieve these aims, the battery of industrial policy instruments needs to be perfected and expanded. In addition to those that are sector-specific, other mechanisms and incentives form part of policies on science, technology, innovation, foreign trade, attracting foreign direct investment, education and training, decentralization, MSMEs, and public procurement.

Rather than the ability to formulate policies, what sets one country apart from another is its capacity to implement them. In that regard, an institutional framework with the appropriate technical capacity and incentives

is required. It must also be empowered politically and have sufficient human and financial resources. In addition, expanding the aims, number and range of industrial policy instruments entails maintaining a systemic vision of national challenges and types of action, which requires improvement and renewal of inter-institutional coordination mechanisms. Industrial policy must be designed to integrate into the structure of countries' public and private institutional frameworks.

2. Cross-cutting guidelines for a new industrial policy agenda

Policy needs are specific to each country, as are the possibilities for their implementation, which in some cases will depend on the productive structure and, in others, on national priorities or the availability of resources. In both cases, there are general guidelines that should be incorporated in an industrial policy agenda aimed at a big push for sustainability. The general guidelines for such an agenda are the following:

- **Identify the triggers for substantive structural change**

Policy design should aim to produce non-inertial changes in the production structure. Identifying the areas that need to be addressed to make progress with this change is no trivial matter. The systemic nature of the problem calls for action both on the components and on the relationship between them. Close and continuous coordination between the private sector, academia, civil society and governments, both at the national and subnational levels, facilitates the identification of priorities for policy action. This is a dynamic and ongoing undertaking, since "structural transformation is not a 'once and for all' process, but rather a persistent task, as the structural transformation process is continuous and may face obstacles at any stage" (Ocampo, 2020, p. 86).

- **Design and implement instruments to build and accumulate technological capacity**

As discussed below, progress in science, technology and innovation has been insufficient in the region and these fields are not positioned strategically as key factors for development. Science, technology and innovation therefore need to be aligned to enable them to make a direct contribution to national priorities. This challenge is particularly complex, because the "process of accumulation of technological and organizational capabilities does play a crucial role... but such process has to be matched, first, by a congruent 'political economy'... and, second, by a congruent macroeconomic management. By the same token, it is futile to search for any 'magic policy recipe' automatically yielding industrialization and catching-up." (Cimoli, Dosi and Stiglitz, 2009, p. 5).

- **Focus on a limited set of strategic sectors**

Efforts should be focused on a small number of sectors to combine resources and achieve the scale needed for substantive change. This is especially important in countries with limited budgets for policy implementation. These sectors must be aligned with national development priorities or plans and with opportunities for regional integration.

- **Build management and governance capacities**

Industrial policy in the region often does not get past the design phase. There is seldom an integrated management process that includes the full cycle of design, implementation, interaction and ongoing adjustment under an appropriate governance mechanism. An iterative process of this sort, in line with the principles of experimentalist governance, is the most effective approach to promote productive development policies under the conditions of rapid change and uncertainty associated with the technological revolution, rearrangements in value chains, changing competition conditions and other factors (Sabel and Victor, 2022; Salazar-Xirinachs, 2022; Cornick, 2017; Sabel and Zeitlin, 2012). The persistent failure to implement policies is the result of various factors, including multiple objectives that lack the measurable targets to enable efficient budget allocation and monitoring. Although policy programmes that include only objectives and lines of action may be useful for dialogue between government and the business sector, unless they include targets and allocate financial and human resources, as well as dynamic cooperation, governance, monitoring and adjustment processes, their implementation will be difficult, if not impossible.

- **Conduct impact assessments and adjust policies in line with results**

The lack of targets and the potential conflicts surrounding impact assessments mean that policymakers themselves are not aware of the outcomes of policies, cannot defend them against parties lobbying for resources to be used for other purposes, and are unable to adjust their content through learning processes (trial and error). While infrequent process evaluations (type and number of actions carried out) can be useful as an input for impact assessments, they should not be considered a substitute.

- **Build institutional capacities that contribute to the new policy measures**

To address implementation failures and the lack of impact assessments, there is a need for a consolidated institutional framework that can both design and effectively implement industrial policy. This institutional framework should include an executing agency, with technical and strategic capabilities to implement and evaluate policy; entities responsible for public-private coordination, with political support and access to senior national authorities; and a development bank to facilitate access to financing for productive investments.

- **Promote environmental and social policies through industrial policies**

The contribution of industrial policies to development is not limited to improving productivity or competitiveness to maximize short-term profitability. Industrial policies can directly support the achievement of environmental and social goals, with adequate coordination to achieve synergies and secure the significant levels of investment required. Therefore, industrial policies must include planning for resilience and for the management of existing and emerging risks (UNIDO, 2021, pp. 139–140).

- **Strengthen the impact of industrial policies on social inclusion**

This can be achieved by formulating and implementing measures to support MSMEs and the social and solidarity economy, regional diversification and local development, as discussed in chapter IV, section I.

3. Toward policies guided by goals and targets

Taking into account the guidelines for a new industrial policy agenda, priority should be given to the following elements that emphasize the need for an active industrial policy that is mission-oriented and focused on the development of new markets and public goods, beyond the correction of market failures. It is a matter of “... providing a direction for growth and increasing business expectations about future growth areas and catalysing activity... that otherwise would not happen” (Mazzucato and Pérez, 2015).

(a) Aligning action with the strategic role of science, technology and innovation

Science, technology and innovation are key tools for sustainable development and vital components of industrial policy. However, Latin America and the Caribbean is lagging considerably in terms of the resources allocated to these areas. The ratio of research and development expenditure to GDP is under 0.6% in all the countries of the region with the exception of Brazil. Basic and applied academic research financed by the State predominates in the region, whereas in developed countries corporate-led and -funded experimental development is more common. Although institutional support for these areas in the countries of the region has increased in recent years, structural weaknesses persist, there is little uptake on policies for improving production and social development and budget allocations remain low (ECLAC, 2022f).

Science, technology and innovation are not separate from other issues of concern to governments and society in general. However, in the region, mechanisms for directing initiatives in these domains hamper capacity-building and resolution of key national challenges. The use of demand-driven competitive funds, so widespread as to be nearly exclusive, is based on the notion that researchers are best suited to identify areas of work in science and technology and that businesses are best positioned to do so in the case of innovation. This policy approach has resulted in projects that are underfunded, limiting market launch and economic impact; projects that are very fragmented, which prevents generation of critical mass; the prioritization of short-term projects, which makes it difficult to address certain strategic development issues, a situation that is worsened

by political cycles; and insufficient investment in research areas that are linked to national challenges, because they are beyond the capabilities of researchers and companies or exceed the scope of their priorities. As a result, the portfolio of projects that is ultimately chosen does not necessarily align with national priorities or with social or economic impact criteria.²³

The core proposal, which encompasses and complements the aims of capacity-building in basic research, is to consolidate instruments and resources around strategic programmes that prioritize issues with a national impact, focusing experimental development, the pursuit of solutions to specific problems and science- and technology-based innovation. One challenge is to increase companies' participation and investment in research, development and innovation.

These programmes should include participatory governance mechanisms, to include the private sector and academia from the outset. Coordination and harmonization between the various stakeholders are fundamental and defining the strategic objectives is a participatory process that should be politically endorsed.²⁴

The need for joint financing and research to reach the scale required is an opportunity for regional cooperation. An example of this is the Community of Latin American and Caribbean States (CELAC) plan for self-sufficiency in health matters, which seeks to strengthen production and distribution capacities for vaccines and medicines in the region, adopted in September 2021 (see section E of chapter IV). In addition, the Conference on Science, Innovation and Information and Communications Technologies, a subsidiary body of ECLAC that brings together high-level regional authorities responsible for science, technology and innovation policy, is the appropriate space for discussing this type of initiative. For example, the mandate for ECLAC from the Conference, in the initial stages of the pandemic, enabled early assessment of the situation and gathering of lessons and good practices regarding the contribution of science, technology and innovation to development of inputs and critical equipment, as well as technological applications for monitoring and preventing the pandemic.

(b) Targeted attraction of foreign direct investment

Policies to stimulate foreign direct investment (FDI) must take into account its impact on innovation, learning and quality employment. While this is true for all types of investment, it is particularly important for FDI. Participating in value chains through goods that only include natural resources or cheap labour is not enough. To maximize the benefits, proactive efforts must be made to foster, through incentives and services, development of production chains, local suppliers and technology transfer, to increase national value added in the value chains that include multinationals. If such efforts are made, FDI has proved to create linkages and learning opportunities within productive structures rather than simply acting as a mechanism for "exporting imports" or creating natural resource enclaves (Cimoli and others, 2017, Salazar-Xirinachs, 2022b).

In general, the countries of the region have moved toward legislation and regulatory frameworks with few limitations and that ensure that foreign investment receives national treatment, meaning that there are no intrinsic obstacles to technology transfer because of restrictions on foreign investment. Nevertheless, a passive or neutral approach is not sufficient. The greatest benefits from FDI are obtained when policies to attract such investment are integrated and coordinated with countries' development policies and active efforts are made to obtain those benefits.

A modern FDI policy should establish specific goals, operate in a coordinated manner with other policies and be integrated within a broader economic development strategy, which should naturally lead to segmentation and overlap with the broader goals of development policy, specific sectoral and regional requirements and the various motivations and strategies of potential investors. It is increasingly clear that inter-institutional

²³ In some cases, in order to account for obvious national needs (such as those arising from the pandemic) or to develop capacities in emerging technologies, countries call for proposals relevant to priority areas.

²⁴ The intelligent specialization strategies implemented in countries of the European Union provide important lessons that can be useful for the region.

coordination is required, in particular with stakeholders involved in generating technological capacity (innovation policy) or structural change (industrial policy). Three lines of action are proposed:

(i) Targeted promotion to complete value chains or attract knowledge and technology

Countries should strengthen their FDI attraction capabilities so as to identify the companies that could produce the greatest benefits for the country and convince them to invest in their economy. In particular, companies that can strengthen or complete the missing links in a value chain or that have a high potential for transferring knowledge or technology are of high priority, because of their contribution to overcoming challenges and achieving industrial policy aims.

(ii) Programmes to foster links and develop suppliers to promote spill-over into local markets

Although, theoretically, there is consensus on the potential benefits of FDI, they will not automatically accrue just because investments are made; the transfer and absorption of those benefits will depend on both the characteristics and strategies of the companies investing and on the maturity of the companies in the recipient country who are possible suppliers. Providing services and incentives to create relationships between companies and develop supplier capacity will be key to achieving these goals.

(iii) Specialized education and training programmes

Having sufficient skilled human resources is crucial to attracting high-quality investment, in particular investment that is knowledge- and technology-intensive. Short-term education and training programmes to close specific human resources gaps can be set up in coordination with beneficiary companies and national universities and training institutions.

(c) Digital business transformation

The adoption and use of digital technologies by companies to improve productivity and competitiveness should be part of every industrial policy.²⁵ This is particularly important in the face of changes in business, production and consumption models, driven by rapid and sometimes disruptive digital transformation, especially since those changes are reshaping value chains in multiple sectors and productive activities. However, in general, policies to support business digitalization in the countries of the region have not taken this new reality into account, or the urgency of implementing measures to support such transformations. In general, productive development policies do not adequately factor in these changes and business digitalization policies tend to be part of broader digital agendas whose priority is the provision of infrastructure, access and connectivity, rather than dissemination and use of technologies and their application in the productive and business sphere (Heredia, 2020; Dini, Gligo and Patiño, 2021). Although several countries in the region have promoted business digitalization and e-commerce policies in response to the pandemic and physical distancing measures, these strategies remain an insufficiently mature component of business support instruments.

The diffusion of digital technologies is a systemic process. Consideration should therefore be given to the main actors, their interrelationships and the environmental conditions the process takes place. This system has four components: telecommunications infrastructure, supply of technological products (such as devices or sensors), services and applications, companies that are users, and the regulatory frameworks concerning areas such as cybersecurity, data protection or digital signatures. Their degree of development and capacity for complementarity with user companies, within their national context, determine their level of maturity and which public policies are appropriate for promotion of technology. There are two types of user companies. The first is companies that are digital natives (for example, platform companies); the second type encompasses

²⁵ Digital transformation is also very important in public administration and government. Section D of chapter I describes the general framework of analysis for the transformation toward a digitalized economy, including the transformation of the State and section F of chapter IV discusses value creation through data, platforms and Industry 4.0.

companies from the traditional economy, which have begun or require incentivization to begin the transition toward becoming part of the digitalized economy. There is a great deal of variety in the second group, from companies that have the resources and capacity for the digital transformation, including Industry 4.0 technologies, to those that lack the knowledge, motivation, resources or capabilities for the transition, a group that includes the majority of companies in the region. In particular, as described in chapter IV, many MSMEs still have low connectivity and make only limited use of the most basic and mature digital technologies.

Digital business transformation should support the incorporation of cutting-edge digital technologies into production processes (supply chains, processing, manufacturing and operations), as well as in distribution channels. Thus, actions should be pursued to improve connectivity, to raise awareness of the potential of technological solutions for companies and productive sectors of different sizes, and to build technical and professional capabilities and produce public assets —such as technology centres— required for this new paradigm.

(d) Strengthening production chains

The production chain approach, in particular the value chain approach, is a practical way of addressing the systemic nature of industrial policy interventions, as it allows the elements and policy proposals mentioned above to come together synergistically within a coherent framework for action. To facilitate detailed methodological approaches aimed at solving specific problems in production processes, it is important to identify stakeholders in production, their interrelationships and their contributions, from providing inputs and raw materials to making the final sale.²⁶

Although production chains can be national, regional or global, the countries of Latin America and the Caribbean, with few exceptions,²⁷ are not part of complex global chains; instead, they participate mainly in chains with forward linkages in the primary products and natural resource-based manufacturing sectors (ECLAC, 2020f). The reorganization of global value chains currently taking place as a result of the pandemic, the war in Ukraine and geopolitical tensions created by globalization could present opportunities for Latin America and the Caribbean.

To take advantage of these opportunities, for example through local companies becoming part of international value chains or by attracting foreign companies, in addition to applying policies such as those proposed in this chapter, regional integration processes need to be strengthened. Complementarities and production synergies should be sought with a view to creating and strengthening regional production chains and reinforcing the region's attractiveness for the relocation of operations, through a near-shoring approach, to take advantage of the geographical proximity of the United States, the world's largest market (ECLAC, 2020f).

In both cases, there is a need to create or consolidate economic and institutional systems that have specialized supply networks, qualified human resources and a stable and easily accessible institutional framework —especially as regards certification, protecting intellectual property, data privacy, regulating competition, and contractual rules— enhancing communication and transportation infrastructure, improving protocols for action in the event of disasters and strengthening the FDI institutional monitoring framework.

It is also important to reduce the time and cost of trade transactions, removing impediments at borders and updating the many free trade agreements in force to include topics such as cooperation in science and technology, respect for workers' rights and care for the environment, all increasingly relevant for the global economy.

²⁶ See Padilla, Pérez and Oddone (2016) for the ECLAC experience and proposal, in a methodological guide on how to approach industrial policy interventions with a focus on value chains.

²⁷ Poised to benefit are the automotive and aerospace industries in Mexico, the aeronautics industry in Brazil and the medical equipment industry in Costa Rica, the Dominican Republic and Mexico.

I. Regional integration in the new geopolitics of globalization

1. A region at odds with global trends

While other regions such as North America, East Asia and Africa have made progress in recent years in implementing far-reaching economic and trade integration projects, that trend has been absent in Latin America and the Caribbean. The regional economic space continues to be characterized by significant institutional fragmentation and a marked divide between the Caribbean, Central America and Mexico on the one hand and South America on the other.²⁸ The result is a failure to take advantage of the regional market and weak integration of production and trade among the countries of the region. Intra-regional trade, which peaked in 2008 at 22% of total exports in the region, has been trending downward since then, reaching just 15% of total shipments in 2021, one of the lowest rates in the world. The region is more dependent than ever on markets outside the region, mainly the United States in the case of the Caribbean, Central America and Mexico, and China and other Asian countries for South America.

The hollowing out of intra-regional trade makes it difficult to move toward an inclusive and transformative recovery. For the vast majority of countries in the region, intra-regional trade is more intensive in manufactures and involves a wider array of products and a larger number of companies, especially MSMEs. For all these reasons, it is the type of trade most conducive to productive and export diversification. Also, compared to extraregional shipments, lower commodity content and shorter shipping distances make it more environmentally sustainable, while higher MSME participation helps to spread benefits more equitably.

The downward trend in intra-regional trade has been accentuated by a strong focus over the last two decades on opening up trade to partners from outside the region, and in particular by China having become the second-largest trading partner for the region. China's burgeoning demand for commodities has reinforced the region's historic primary export pattern, especially in South America. However, the large-scale arrival of Chinese manufactures has displaced shipments from the region in a wide range of industrial sectors and in all subregions. From a political economy standpoint, this trend is concerning. If the economic opportunities associated with the regional market are perceived as ever less attractive than those of extraregional markets, businesses will tend to prioritize stronger links with extraregional trading partners (for example, through the negotiation of new trade agreements), deepening the extraregional bias of export supply.

The low level of intra-regional trade also stems partly from the institutional weakness of integration agreements. Historically, the region's countries have been reluctant to cede national jurisdiction in order to move toward joint sovereignty mechanisms. Evidence of this is that none of the subregional projects to establish a common trade policy have fully achieved that objective. Moreover, countries have often responded to internal difficulties by adopting unilateral measures that hinder intra-regional trade, such as tariff hikes and non-tariff barriers. These weaknesses have been accentuated by frequent changes in countries' stances on integration as political leadership changes hands. Together, these factors have undermined the continuity of projects whose implementation requires a long-term perspective and support through State policy.

The economic disintegration experienced by the region is particularly worrying in light of the opposing trends that are beginning to take shape at the global level. In order to mitigate global value chain vulnerabilities highlighted by the pandemic and geopolitical shocks, countries are promoting greater regionalization of trade and production networks. Today, governments are seeking greater strategic autonomy in the supply of key products and inputs, favouring resilience and reliability of supply over cost minimization. Relaunching the regional integration project is essential for this reason. The policy proposals presented below, which expand on and update those contained in ECLAC (2021f), are aimed at infrastructure development, digital integration

²⁸ For an analysis of recent changes in the "North American factory" and Mexico's relationship with it, see Garrido (2022).

and the formation of intraregional production chains that, in addition to boosting economic activity, reduce excessive dependence on suppliers from outside the region in sectors such as those analysed in chapter IV.

2. Toward more resilient, efficient and sustainable regional infrastructure

Poor regional transportation and logistics infrastructure generates high carbon dioxide emissions, increases the cost of intraregional trade, hurts export performance and prevents appropriate distribution of the gains from trade and investment. For this reason, along with reducing the regional infrastructure gap, the pattern of investment needs to shift toward more resilient, efficient and sustainable works and services.

In Latin America, high levels of carbon dioxide emissions from transportation are partly the result of the large land area of several countries, which requires vehicles to travel long distances. In addition, investment in infrastructure (including its maintenance) is low and the current distribution of transportation networks by mode is heavily skewed toward roads (Lardé, 2021; Sánchez and others, 2017; Sánchez Di Domenico, 2019). Low interconnectedness and the scarcity of alternatives to road transport make it very difficult to switch between different transport modes, resulting in long travel times and high transportation costs (Lardé, 2020). This situation hampers intraregional trade and the capacity to increase productive integration within the region.

An improvement in the provision and quality of regional infrastructure would reduce the transaction costs associated with moving inputs and end products, thus allowing production from rural and remote areas to reach markets at competitive prices and facilitating the development of new economic activities. Prioritizing infrastructure resilience—for example, through climate change adaptation strategies—should be one of the guiding principles of new investment cycles in the region, along with minimum standards of efficiency and sustainability. Given the scant fiscal space currently available to countries, this is an area where interaction with regional development banks will be crucial.

Infrastructure investments should be oriented toward a new arrangement between modes of transportation that focuses more on rail and inland waterways. In addition to the benefits associated with better spatial distribution of economic activity, this would bring several environmental benefits, including lower carbon dioxide emissions. The contribution of a better modal split toward a more sustainable transportation system will also depend on factors that go beyond increased investment and the promotion of alternatives to road transport. These factors include the establishment and application of appropriate regulatory frameworks and supply and demand management for infrastructure and related services. Both factors involve areas such as periodic infrastructure maintenance plans, infrastructure quality, standards and regulations for fuel consumption, efficiency and engine size and the use of cleaner technologies, such as e-mobility solutions, among others.

3. Digital cooperation for regional production

Despite the central importance of the digital revolution in all areas of social and economic activity, the region lacks an institutional framework for the discussion of digital cooperation policies, rules and standards. In this context, the Digital Agenda for Latin America and the Caribbean (eLAC 2020) emerged from the Sixth Ministerial Conference on the Information Society in Latin America and the Caribbean. The agreements reached in this framework include promoting the preparation and implementation of broadband plans with specific and measurable goals; fostering the development and incorporation of digital skills; promoting inclusion in policy design; coordinating actions aimed at guaranteeing privacy and the protection of personal data; and promoting the use of digital technologies in firms, with a special focus on MSMEs.

The reinvigoration of regional economic integration requires greater linkages between the subregional groups on digital matters, in order to specify thematic priorities and their operational management. ECLAC has proposed a work programme in the areas of digital infrastructure (including 5G high-speed networks) and connectivity to ensure universal access to broadband Internet; data protection and digital security; competition

and regulatory policies; and digital taxes (ECLAC, 2020e). These steps forward would jointly pave the way for the gradual establishment of a common Latin American and Caribbean digital market, opening up significant opportunities for growth in intraregional trade in goods and services. As in the case of transport and logistics infrastructure, the development of digital infrastructure is another area where coordination with regional development banks is essential for the mobilization of the required resources.

4. Convergence for productive integration

For new regional production chains to be economically viable, a broad and stable market must be fostered. It should create efficiencies of scale while minimizing the transaction costs related to the cross-border integration of production. This calls for integration initiatives that transcend existing agreements and foster convergence between the various subregional groupings. In addition to tariffs, where significant headway has been made, the convergence agenda includes important topics such as the strategic use of national procurement systems, regulatory harmonization and the drafting of regional trade facilitation agreements.

Given its economic importance, public procurement can be a powerful force in driving regional production and can generate incentives for the development of new industries or the expansion of existing ones.²⁹ This effect will be magnified if the countries of the region can reach agreements to coordinate national public procurement and enable regional suppliers to compete on equal footing with those from outside the region, which currently enjoy preferential access through free trade agreements.

The gradual harmonization or mutual recognition of technical, health and phytosanitary rules is another area of the convergence agenda that could significantly boost intraregional production networks (see the example of progress within the Pacific Alliance in box V.5). Such progress would particularly benefit exporting SMEs, since they have less capacity than large firms to deal with the multiplicity of regulatory requirements they face in the different markets within the region. Similarly, in order to promote production linkages between the countries of the region, it would be useful to explore options that allow for gradual progress toward full regional cumulation of origin (ideally based on a single set of rules of origin).

Box V.5

Regulatory harmonization in the Pacific Alliance

Since the creation of the Pacific Alliance in 2011, its member countries have pursued several sectoral regulatory cooperation initiatives. Those initiatives aim to remove unnecessary barriers to trade resulting from discrepancies in the application of standards and technical regulations in each member country. The sectors in which agreements have been reached are cosmetics, food supplements, household cleaning products and medical devices, and work is currently under way regarding the medicines sector. All these agreements are aimed at harmonizing the technical regulations of each member country in aspects such as the definition of each product category, labelling requirements, requirements for the issuance of health permits and good manufacturing practices. Likewise, in the case of low-risk medical devices, agreement was reached to mutually recognize health registrations issued by the regulatory authorities of any of the member countries.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Pacific Alliance, “Committee on Technical Barriers to Trade” [online] <https://alianzapacifico.net/en/technical-group-tbt-regulatory-cooperation/>.

One task that is pending is the adaptation of regional production rules for the chemicals, pharmaceutical, automotive, metalworking and electronics industries, among others, mainly in segments linked to the production of intermediate inputs (parts and components, or supplies), where regional production capacity exists, for end products that pollute less (lithium batteries, green hydrogen, vehicles, buses, and electric motorcycles, as

²⁹ In 2017, public procurement of goods, services and public works at the central, state and local levels accounted for an average of 17.4% of total government spending in the countries of the region (OECD, 2020).

discussed in chapter IV). Measures to promote regional linkages in these industries are urgently needed if the region is to diversify production and become less dependent on extra-regional production. Recent examples include heavy dependence in the domains of medicines, medical devices, electric buses and fertilizers, where the China, Germany, the Russian Federation and the United States have an advantage because of fragmented regional production.

The countries of Latin America and the Caribbean concur on the importance of streamlining cross-border procedures for participation in value chains within and outside the region and for the internationalization of MSMEs. The positive impact of progress made at the national level in trade facilitation, cumulation of origin, setting standards and harmonizing production regulations is multiplied when such initiatives are taken at the regional level. An outstanding example is the regional mutual recognition agreement for authorized economic operators signed in May 2022 by the customs services of 11 countries in the region.³⁰ This agreement will allow companies certified as authorized economic operators in one member country to access similar benefits in other member countries, simplifying relevant customs procedures and enhancing logistics chain security. Valuable work is also under way at the regional or subregional levels in making foreign-trade “single windows” interoperable and in the issuance of digital certificates of origin.

Given the intensification of e-commerce as a result of COVID-19, which will not be reversed once the pandemic is over, the regional trade facilitation agenda should focus in particular on promoting this form of trade, especially for MSMEs. The countries of the region should consider permanently retaining some of the measures implemented in the wake of the pandemic, such as the acceptance of electronic phytosanitary certificates and fewer physical inspections. Regional protocols also need to be developed to coordinate in addressing future pandemics or other disruptive events. Such protocols could include agreements on which goods are to be considered essential, as well as the establishment of expedited procedures for their movement across borders.

The World Trade Organization (WTO) Trade Facilitation Agreement, to which all the countries of the region are party, provides a minimum threshold of disciplines from which the countries of the region can consider more ambitious commitments, especially in the area of digitalization of procedures. In this context, the negotiation of a regional framework agreement on trade facilitation would be a powerful political signal of commitment to integration and would help to increase the fluidity of intraregional trade and production networks.

Several of the mechanisms already mentioned, such as regulatory harmonization and the coordination of public procurement, are included in the plan for self-sufficiency in health matters in Latin America and the Caribbean adopted in September 2021 in the framework of CELAC. A revitalized CELAC could be the ideal forum for similar initiatives in other regionally significant industries, such as food and fertilizers. To this end, the countries of the region must strategically take advantage of their abundant natural resources. For example, as discussed in chapter IV, Argentina, Chile and the Plurinational State of Bolivia account for almost 60% of the world's lithium resources, a crucial input for decarbonization of transportation systems and the transition to a green economy. Thus, coordination of lithium value chain policies and investments could generate significant regional production and technological capacity in the electromobility sector, supporting the big push for sustainability.

J. Conclusions: the path forward

The policy options proposed in this chapter are the result of the global, regional and sectoral analyses presented in the previous four chapters. They have shown that the severe effects of the succession of crises that have hit the region over the course of more than a decade have combined with long-standing structural problems, such as the lack of diversification of the economy toward sectors whose competitiveness is based on increased productivity, technological development and growth in global demand; insufficient creation of quality jobs; and

³⁰ Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Guatemala, Paraguay, Peru, Plurinational State of Bolivia and Uruguay.

the persistence of high levels of labour informality, poverty, extreme poverty, inequality and discrimination linked to a persistent culture of privilege.

Overcoming these problems and the lock-in effects that hold the region back and keep it on a slow-investment and low-growth trajectory requires the implementation of not only macroeconomic policies for development but also a wide range of productive development, social and environmental policies with a strong sectoral dimension. In short, it involves advancing an agenda of economic growth, social inclusion and environmental sustainability consistent with the 2030 Agenda for Sustainable Development and its goals. The importance of this new Latin American and Caribbean agenda, and the need to move forward with its formulation and implementation, is evidenced by persistent structural problems and increasingly active social movements that not only reflect the discontentment of broad social groups, but also drive and bring about significant changes in the region's political landscape.

Among the wide range of strategies and policies proposed in this document, some deserve to be emphasized. First, it is urgent to take action to recover the necessary levels of investment and growth. The persistence of external constraints means that rapid progress in structural change is needed, while the environmental crisis reinforces the need for this change to prioritize sectors and areas of activity that contribute significantly to sustainability.

Second, sectoral and general analyses and proposals reiterate that the role of the State is crucial and irreplaceable in all its dimensions, from articulating proposals and providing financing on a scale not easily accessible to the private sector to defining regulatory models and formulating and implementing policy. Moreover, it has been frequently highlighted that changes are needed in the structure and actions of the State to increase efficiency and effectiveness in the provision of services and in implementation of policies to drive major investment and productive development for economic, social and environmental sustainability.

Third, there is a need not only to interlink sectoral and general policies but also to create space for stakeholders to negotiate, make decisions and take action while acknowledging their different capacities, advantages and limits. Among these stakeholders are those most disadvantaged by the pandemic and inflation, including households in the poorest quintiles of income distribution, women, children and adolescents, indigenous peoples, Afrodescendants and migrant populations. Although these social groups are very heterogeneous and have different economic and social conditions, one of their general characteristics is their vulnerability to internal and external shocks, which also affect many middle-income households. A large segment of the business world is similarly vulnerable, particularly micro- and small enterprises and those in the social and solidarity economy, sectors that provide most of the employment in all the economies of the region.

In order to coordinate policy alternatives to address such a plethora of problems, this document has reiterated the need to advance in fiscal, productive, social and environmental pacts, which are essential to overcoming the problems of the current situation and to moving, over the long term, toward sustainable, cohesive and resilient societies, in short, progressing toward the realization of a welfare state that is part of a care society. The path toward this vision of society entails concerted efforts in the following three areas: sustainability, because without it we will continue on the path to environmental catastrophe; inclusion, because it is essential for progress toward welfare states and more egalitarian societies; and production, because without it there will be neither resources nor high-quality jobs to make these aspirations a reality. This is the rationale behind the messages and title of this document.

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In a regional and international context of weak growth, high inflation and growing inequality, the countries of Latin America and the Caribbean must focus policies on reactivating, rebuilding and transforming economic and production systems to advance towards low-carbon and high-tech economies that address climate change and reduce their historical gaps, structural heterogeneity and dualism.

This document considers the complex conditions that pose significant challenges to accelerating growth, tackling high inflation and the cost-of-living crisis, maintaining transfers to the most vulnerable households, mitigating the social costs of the crisis and boosting investment.

Its chapters analyse the dynamics of globalization and the policy challenges in changing the production structure and moving towards sustainable development. In addition, they consider strategies for reducing inequality and creating universal protection systems and decent jobs in a challenging world. Nine strategic sectors expected to drive a big push for sustainability are examined through the prism of green growth. The document concludes with policy recommendations for advancing towards a renewed model for inclusive and sustainable growth.



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