

Where next for Latin America? The two faces of the new Latin American capitalism

Jorge Katz

Received: 19/04/2023
Accepted: 08/05/2023

Abstract

In Latin America, “islands of modernity” associated with a new biological and digital paradigm in the exploitation of natural resources and the production of services and manufactures coexist with vast segments of the population mired in insecurity, poverty, stagnation and social exclusion. This structural dualism reflects a growing gap between a modern segment of society that emulates the behaviour patterns of developed nations and a segment that lags behind, in which labour informality, basic material deprivations and rising citizen insecurity predominate. The lack of an appropriate theory of development capable of examining institutional and regulatory fragility, the capture of State resources by large corporate groups and a lack of long-term policies reflect this internal divide. At the same time, the external divide with South-East Asian countries is widening. This article argues that a new social covenant is needed if growth is to be attained and income distribution is to improve.

Keywords

Economic development, capitalism, peripheral capitalism, development models, industrialization, technological change, productivity, economic conditions, poverty, Latin America

JEL classification

O14, O33, O54, P10, D31

Author

Jorge Katz is a full professor at the Faculty of Economics and Business of the University of Chile. Email: jorgekatz39@gmail.com.

I. Introduction

The research agendas and academic output of professional economists are often conditioned by the economic and sociopolitical environment in which they happen to live. This makes it perilous to assume that the economy normally behaves in the way suggested by the dominant theory, which conceives the functioning of the major economic aggregates as reflecting a generic, universal model and is only marginally concerned with issues specific to the institutional environment of developing nations. This is particularly true when we consider proposals for State intervention (or non-intervention) related to the functioning of the economy.

We have to accept that the received literature as presented in the major journals of the discipline, in the information disseminated by the international media and in the topics discussed by professional economists are all heavily influenced by what happens in developed countries. Only sporadically are the problems of developing nations and the institutional circumstances under which they have to be dealt with discussed. There is a lingering belief that the peripheral economies are a backward version of more mature economies, which are reluctant to apply strict market rules that would eventually allow them to close the relative gap with the developed world. It is almost never accepted that different forms of capitalism prevail worldwide, each with an idiosyncratic and distinctive economic and institutional set-up that needs to be understood on its own terms.

Some of us believe that economics is not an exact science but a discipline rife with imperfect information, uncertainty and intangible factors that are difficult to measure. For these reasons, differences in ground rules and in the behaviour of economic agents, the way in which companies and consumers react to economic policies and the way firms and individuals develop their expectations for the future are strongly influenced by local circumstances. This state of affairs cannot be ignored, nor can it be assumed that reality will in the long run adapt to the theoretical model proposed by the dominant narrative in the discipline. As Robert Solow put it in his 1987 Stockholm lecture when he received the Nobel Prize in Economics for his contribution to neoclassical growth theory: we are asked to regard this theoretical construction as a model of the functioning of capitalism but this is not convincing, since the markets for goods and for labour look like imperfect pieces of social machinery with important institutional peculiarities and do not seem to behave at all like transparent and frictionless mechanisms for converting the consumption and leisure desires of households into production and employment decisions (Solow, 1988, pp. 310 and 311). In other words, not even the author honoured for providing the discipline with the neoclassical growth model now taught at the world's leading universities loses sight of the institutional peculiarities that prevent a social optimum from being achieved. It is clear that these peculiarities are necessarily specific to each country and region.

The second section of this paper critically examines the relationship between the view proposed by the dominant theory and its heuristic value for understanding situations that are strongly influenced by institutional features and norms and customs specific to each national (or even subnational) setting, market failures and forms of collusion among firms, and State capture by national and international corporate groups. This being so the policy lessons emerging from a model that assumes properly functioning institutions and markets must be treated with great caution when examining the issues that require attention in the peripheral world, where market failures, collusion and State capture by large corporations are the rule rather than the exception.

In the case of developing countries it is crucial to ask, for example, why so many of them have fallen into a phase of stagnation that has now lasted for years, despite having tried different government programmes to break out of this situation. It is also necessary to ask why, in a number of cases, there are clear signs of deindustrialization and loss of competitiveness in low-technology manufacturing sectors, such as footwear, apparel and technically unsophisticated capital goods, with markets increasingly being captured by South-East Asian companies that displace small and medium-sized local firms.

Other pertinent questions are why the world of SMEs is facing so many difficulties to incorporate digital technologies and automation in production processes and thus achieve productivity improvements, opting instead to revert to the assembly of imported parts and components; why quality jobs are not being generated and informality is growing in labour markets; and why poverty and social exclusion are increasing and access to merit goods such as drinking water, urban sanitation services and primary health care, whose provision should be an inescapable obligation of the State, is not improving. These questions often do not arise in developed countries, and when they do it is without the same degree of intensity as in many peripheral countries.

Notwithstanding the situation of decline described in the previous paragraph, it must be acknowledged that, from the point of view of the long-term transformation of capitalism in peripheral countries, it only partially reflects the contemporary scene. Many developing countries, especially in Latin America, are rich in natural resources, both renewable and non-renewable, and many of these activities are currently transitioning towards a new production paradigm resulting from changes in the world's knowledge frontier in biology, genetics, computer science and process digitalization, the use of artificial intelligence and data mining. Owing to these changes, some businesses engaged in the exploitation of natural resources and the provision of services are gradually moving towards novel, science-based forms of production organization. Although this is still an incipient phenomenon in the developing world, it seems to be signalling a long-term trend that is unlikely to stop.

In other words, the new Latin American capitalism has followed a path in which stagnation, deindustrialization and rising poverty and social exclusion coexist with islands of modernity where efforts are being made to move towards a new paradigm of industrial organization. The new Latin American capitalism exhibits, then, a new pattern of structural dualism that cannot be ignored. These issues are addressed in the third section of the paper, which argues that the new development model has resulted in a growing gap between different segments of society and in new forms of institutional complexity that are contributing to a worsening of democratic governance and an increase in social tensions and urban insecurity. The gap between the modern segment of society and the segment that is lagging behind has widened, social discontent has increased, personal security has deteriorated greatly and various forms of social confrontation have proliferated. This situation is presumably a response to the poor long-run performance of the economy and the greater inequality prevailing today, but it has also been facilitated by the increasing role played currently by illicit activities associated with the increasing availability of drugs and with the opacity and scarce regulation of financial activities exploiting social marginalization. Governments have become increasingly unable to handle these new issues and social discomfort has clearly grown.

To put it differently, the new Latin American model of social and economic organization no longer seems to be manageable exclusively by means of conventional market instruments and policies, as has been attempted in the past. Instead, it calls for new forms of intervention in which the provision of merit goods (drinking water, urban sanitation services, better primary health care and improved public education) and the delivery of goods for collective use that would help to reduce poverty and social exclusion could be delivered concomitantly with policies favouring the transition to digitalization and automation of the production matrix, the upgrading of workforce skills to halt the advance of informality, and support for local small and medium-sized enterprises, so that they can more successfully confront the competition from South-East Asian companies.

The fourth section of the paper argues that in this new phase of Latin American capitalism, in which poverty and secular stagnation coexist with incipient modernization in isolated parts of the economy, local factors, i.e. the ground rules and internal forces of each society that determine the conduct and expectations of economic agents, become central to our understanding of society's behaviour and to the design and implementation of public policies capable of adequately dealing with the growing complexity of national economies.

Looking at matters from this perspective leads us to adopt a critical view of the analytical framework offered by the dominant theory, which operates on the basis of a universal model of economic behaviour according to which the free functioning of markets and competition adequately guides the development path of the economy. In this theoretical framework, State interventions can only be justified by market failure, but the theory lacks a true understanding of the institutional complexity of the environment in which each country operates. Nor does it recognize the importance of local factors or the extent to which these idiosyncratic domestic features condition the political economy of each particular national scenario. When incorporating the notion that local factors matter and that each country's institutional specificity cannot be ignored in the design of public policy, it becomes clear that our discipline still lacks a theory of economic development which adequately incorporates many of these significant institutional and non-market forces. Local realities are normally approached from the perspective of the logic of the generic, universal model provided by the dominant theory, and little consideration is given to the fact that the institutional framework and ground rules of each national case have a profound influence on the behaviour of the economy. State capture by large corporate groups constitutes a feature of each local political economy that calls for specific local action. Technological knowledge cannot just be brought in from abroad as if it were a ready-made set of artefacts and user manuals that can be easily integrated into the national scene. Local institutions and human resources with the skills to adapt and use said knowledge are needed, and how to attain them constitutes a much more complex and demanding issue than that envisaged by the dominant growth theory.

Producing shoes is not the same as producing, for example, copper, salmon, soybeans, fruit, wine, health services, wind or solar energy, environmental care programmes or seeds adapted to the local requirements of any given country. Specific local biological, physical, sanitary, environmental and even political conditions are central features of the production organization model that must be taken into account. Technological knowledge specific to each locality is required. Technicians and professionals are also needed, as are institutes to train them and regulatory agencies and State supervisory bodies to monitor compliance with standards and ground rules tailored to the characteristics of each local environment.

All this said, it is clear that the new capitalism of the peripheral world calls for a theory which can facilitate understanding of the macro and micro, institutional and regulatory spheres, non-market aspects and the need for public and merit goods of various kinds, and not just conventional market rules and competition. There is a need for new forms of collective action and new models of social organization that must be devised locally in order to revitalize the production matrix and restore growth and equity.

The fifth and final section of the paper presents a brief reflection on the future. Three major issues are currently priorities in peripheral countries. The first is how to deal with industrial stagnation and the incipient deindustrialization currently being experienced in many countries of the periphery. This phenomenon is fuelling growing informality in labour markets, a lack of opportunities and, ultimately, poverty and social exclusion that lead to the deterioration of governance.

The second issue has to do with the shift towards Industry 4.0 models of production organization, both in sectors that exploit natural resources, such as agriculture, stockbreeding, mining, forestry and non-conventional energy generation, and also in a wide range of services, including health and financial services, e-commerce, the electrification of transport systems, and many others. A central element in this process is the role to be played by the generation and dissemination of domestic technological capabilities and the local production of equipment and artefacts adapted to the domestic specificity of the newly emerging production organization models.

In addition to the above, a third issue has recently emerged that should be taken into consideration: the negative impact of the health crisis caused by the coronavirus disease (COVID-19) pandemic, which continues to affect activity levels, impeding job creation and worsening the social exclusion

that was already occurring because of the countries' stagnation. The impact of the health crisis has added further drama to the pattern of persistent economic and social decline inherited from the past. However, it must be acknowledged that the consequences differ from country to country, depending on the role adopted by government authorities, the greater or lesser scale of fiscal subsidies, rates of vaccination and follow-up of registered cases, the greater or lesser efficiency of primary health-care services and other factors. It is now clear that it will take long years and substantial efforts in the delivery of public health, education and community support to make up the ground lost, especially in the poorest segments of the population, but also in middle-class sectors that have now joined the impoverished sections of society. It is a matter not only of restoring jobs, but also of understanding that the health crisis has resulted in more complex and intangible problems affecting the mental and psychological health of large sections of the community and giving rise to new forms of uncertainty and insecurity that require urgent consideration.

The situation is further aggravated by the impact of the Russian Federation's invasion of Ukraine and its recessionary and inflationary effect on the world economy. There can be no doubt that this has particularly affected the peripheral world, as energy imports have become more expensive and the supply of intermediate inputs for domestic production, both primary (fertilizers) and industrial (parts and components for industry, medical supplies), has suffered. At the same time, however, new trade opportunities have opened up in food, agricultural products, and so forth. The impact of these new world circumstances will no doubt differ among countries and each one will have to craft a specific and individual response.

Lastly, and no less worryingly, there is the growing climate of tension and uncertainty in the world economy resulting from China's global advance and the intention it has repeatedly manifested of gaining control of raw materials critical to the future digitalization of its production matrix (e.g. lithium and rare earths). Also worth noting is China's intention of gaining access to land with high agricultural productivity and to water reserves and energy sources that can meet its needs in the future. These issues and the way each developing country chooses and is able to manage its relationship with China, constitute another open-ended topic that has so far been scarcely explored by developing nations, but that will demand serious consideration in the future.

The preceding paragraphs have provided a rough outline of the broad spectrum of issues that Latin American countries will have to face over the coming decades. Short- and medium-term interventions will be needed to gradually tackle poverty and social exclusion, to attain progress in the delivery of merit goods such as drinking water, urban sanitation, education and public health, and to improve the urban security situation, which has deteriorated sharply in recent years. These are tasks that will require an enormous amount of new resources and new sources of long-term financing, for which a new social covenant will be required if government intervention is at all possible. It is not just a fiscal and tax reform that is needed, but also a new public-private cooperation model that would reduce problems such as tax evasion, corrupt practices and illegal activities associated with the drug trade.

In addition to the above, however, it will also be necessary to undertake further-reaching programmes aimed at restructuring the production structure in order to gain more competitiveness and productivity growth across the economy. New windows of opportunity will no doubt open up in the future as a result of digitalization and the development of new digital services for manufacturing activities. Progress will have to be made in the decarbonization of agricultural production, in stockbreeding and mining, improving the traceability and digitalization of production processes and restructuring the energy production sector through the replacement of fossil-based energies with wind, solar or tidal energy. It will also be necessary to develop and strengthen the local engineering service industry in such a way that local digital service providers are able to meet the needs of the new Industry 4.0 production organizational models that will be developed in the future.

The magnitude of the tasks facing the State clearly far exceeds the resources available today. This means that a debate on priorities will be needed, bearing in mind that the State's resources are at present severely compromised as a result of tax evasion and subsidies being granted large domestic and international corporate groups. This is a huge topic of concern. If there is to be any prospect of developing the social safety net that is so badly needed at present to reduce poverty and exclusion and, simultaneously, of implementing industrial policies for a successful transition to modern production infrastructure, a new public-private covenant is clearly required.

The magnitude and complexity of the tasks that need to be tackled indicates the need for new social rules and priorities that could secure the greater, permanent, long-term funding required to undertake the necessary reforms. The current fragile state of the economy and the deteriorating rules of democratic governance in many countries in the region suggest that, in spite of the scale of the challenges ahead, there are not many possible alternatives, as the secular stagnation of the economy and the increasing problems of governability clearly indicate that profound changes are required if growth and more equity are to be attained in the future.

II. Dominant theoretical agendas in economics and their impact on developing countries

The 1930s, a decade marked by the deep recession in the world economy between 1929 and 1933, saw the emergence of two major schools of thought that exerted a major impact on the way economists discuss the issues of development and growth, as well as the role of the State in the economy.¹ John Maynard Keynes, with *The General Theory of Employment, Interest and Money* (Keynes, 1936), and Joseph Schumpeter with *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process* (Schumpeter, 1939) and *Capitalism, Socialism and Democracy* (Schumpeter, 1942), marked out the path that has been travelled in more recent years by dozens of professional economists studying the workings of capitalism and the role of the State in the economy.

The two authors had very different objectives. Keynes was inspired by the desire to find a solution to the crisis in the world economy and the wide gap between real and potential output in those years. He concluded that State intervention and a proactive government fiscal policy were the way forward. Schumpeter, meanwhile, sought to explain the ultimate genesis of capitalism, the driving force behind its evolution and transformation over time, and found that innovation, the replacement of the old by the new, was the essence of this ongoing transformation in society's production and institutional matrix.

Starting from a microeconomic perspective, Schumpeter provides an overview of the evolution of the organizational model of society, of how actors, institutions, rules of competition and forms of social organization change over time and are replaced by others through disruptive innovations that transform the way things are done. Keynes, for his part, and working from a macro perspective, seeks to describe how the economy functions and how short-run equilibrium and full employment can be restored. The solution is not to cut wages but to increase public spending and aggregate demand in order to close the gap between actual and potential output. It is the closing of this gap that is to increase the level of employment, and not the reduction of wages paid to workers, as postulated by classical economics.

¹ It is important to mention the voluminous output of Karl Marx, written almost a century earlier, which inspired Schumpeter's thinking in his formative and working years in Vienna and Germany. Marx's writings have also influenced the thinking of economists such as Paul Sweezy, Paul Baran and M. Kalecki and the Faculty of Economics at Cambridge University (United Kingdom) under the leadership of Joan Robinson and Nicholas Kaldor. Unfortunately, Marx's contributions are hardly discussed today in the world's leading universities.

It is clear that Keynes's and Schumpeter's writings present two very different ways of looking at the behaviour of the production structure and social organization. What the two have in common, however, is that they deal exclusively with the functioning of developed countries.^{2 3} Their work does not reflect how capitalism works in the peripheral economies, nor do they take into consideration the role of natural resources in growth, a subject that will be examined in more detail in later sections of this monograph.

Keynes's ideas quickly became pre-eminent in academia, and Keynesian thinking was clearly dominant in the 1950s and 1960s, underpinning the role of the State and fiscal spending as pillars of countercyclical policy and growth. The New Deal in the United States and the 1942 Beveridge Report in the United Kingdom set the direction. Growth, employment and the protection of individuals from catastrophic situations that they could not cope with by themselves, such as unemployment, were seen as requiring active government intervention.

Unsurprisingly, then, developed countries had a clear bias in favour of industrial policy at the time, looking favourably on the role of the State as a driver of industrialization in the peripheral world. This same outlook spread to developing countries, and the public sector adopted a proactive attitude towards the establishment of various industries, particularly iron and steel, petrochemicals, pulp and paper, but many others too. Financial institutions such as the Production Development Corporation (CORFO) (Chile), Nacional Financiera (NAFIN) (Mexico), the National Bank for Economic and Social Development (BNDES) (Brazil) and the National Development Bank (BND) (Argentina) played a central role, reflecting the extent to which developing nations were influenced by ideas from more mature countries.

Keynesian theorizing also underpinned the growth of social spending, especially in areas such as health, education and social security. In a number of peripheral countries, an incipient home-grown welfare state emerged, marked by the institutional idiosyncrasies of each society. The case of Argentina and the emergence of trade union power is emblematic of this experience of creating a welfare state mired with strong local idiosyncratic features.

In contrast, the 1970s brought great winds of change. For one thing, the international situation entered a highly turbulent phase associated with the two oil crises of 1973 and 1979 and the Viet Nam war. The United States economy experienced a deep recession with inflation that lingered for many years, affecting interest rates and strongly impacting developing countries. The changing political climate in the United States and the United Kingdom led to the election of conservative governments that sought to weaken the role of trade unions in the life of their respective countries and to radically reduce the role of the State. A subsidiary role for the State was advocated, and the free play of market forces was prioritized in the adjustment towards economic equilibrium with a view to achieving full employment.

These institutional and policy changes were echoed in academia. Building on the ideas of economists at the University of Chicago, a new analytical paradigm challenged the Keynesian view of the role of the State and the belief that fiscal policy was necessary to achieve equilibrium with full employment. The new classical economics arrived in the company of rational expectations and Walrasian long-run equilibrium theory in the writings of Lucas and Rapping (1969), Lucas and Sargent (1978) and Lucas and Prescott (1971), among others, who argued that State intervention was unnecessary because prices efficiently fulfilled the role of guiding the economy towards equilibrium with full employment.

² Schumpeter's argument is constructed on the basis of a detailed study of five economic sectors (automobiles, textiles, railways, iron and steel and energy) in three developed countries (Germany, the United States and the United Kingdom). In Keynes, meanwhile, there is no reference to sectors or the micro level, no mention is made of specific companies, and the argument revolves around the major economic aggregates. Shortly afterwards, John Hicks (1937) stylized Keynes's thinking with the IS-LM model for a closed economy. Then Robert Mundell and Marcus Fleming extended this idea to an open economy with free movement of capital. This is now the core model used in economics teaching in the world's leading universities.

³ In recent years, a new school of authors has sought to bridge the gap between Keynes's aggregate demand and Schumpeter's thinking about structural change. This novel approach combining Keynes's ideas with Schumpeter's is an interesting contribution to contemporary theory, albeit one that still pays little attention to the idiosyncrasies of the developing world.

This ideological shift led on to the consideration of the State as a subsidiary agent in the economy. Areas such as health care, education and pensions came to be seen as ones in which private provision would do a better job than public provision. The public sphere lost ground to the private one, while individualism gained ground in society.

This political and theoretical shift in the developed country debate had a great impact on peripheral countries, which went through a deep structural crisis in the 1980s associated with the Mexican moratorium of 1982 and the large increase in interest rates imposed by the adjustment process in the United States. The 1980s became a “lost decade” in terms of growth, reflected in stagnation, rising unemployment, poverty and social exclusion. State support for industrialization disappeared, and the need for national efforts at technology creation were considerably reduced. Importing technology from developed countries came to be seen as an adequate substitute, reducing the need for local investment in research and development (R&D). The industrialization process entered a phase of stagnation, and specialization in exports of raw materials with little domestic value added intensified. These issues are discussed in the next section of this paper.

III. The lost decade and economic management based on inflation targeting and the pursuit of short-term financial equilibrium

The oil crisis already mentioned, the lack of external financing, the conditionality clauses imposed by the international lending agencies refinancing the debt of developing countries and the installation of severely repressive military governments in Argentina, Brazil, Chile, Uruguay and other countries of the region led to the adoption of economic management programmes based on the external opening of the economy, market deregulation, the privatization of public companies and the prioritization of inflation targets and short-term financial equilibrium. Long-term policies to transform the production matrix of the economy were largely neglected. The new public policies induced a profound transformation of the production and institutional environment in developing nations.

The industrializing policies of the post-war period were gradually dismantled. A well-known Argentine finance minister went so far as to say that the best industrial policy was one that was not implemented.

In developed countries, however, State action continued to play a central role in driving technological progress, supporting the development of the Internet and biotechnologies, and strengthening international institutions in the field of industrial property rights through the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement. In these countries, the State did not abandon its role as regulator of the economy, nor did it abandon the need for a safety net through the provision of merit goods as can be seen in the case of the Medicare programme in the United States.

Contrariwise, peripheral countries prioritized the pursuit of short-term financial equilibrium, while at the same time they gave up on production development and innovation, cut education and public health spending and moved to privatize pensions, favouring the creation of private pension funds. As a consequence of this new public policy framework, manufacturing industry entered a phase of stagnation and a number of economies in the region began to experience incipient deindustrialization. Government failures were regarded as more serious than market failures, and collusion practices between business firms and the capture of public subsidies by large domestic and international corporations were largely ignored.

Increased macro volatility, falling investment rates, stagnating industrial productivity and State capture by large corporate groups made the financial situation of the State extremely critical and led to severe economic contraction. The State was forced to reduce social spending and discontinue measures aimed at combating poverty and social exclusion, and the social divide became more entrenched.

The above discussion suggests that the dominant theoretical paradigm emerging from developed countries is not always suited to the needs of peripheral capitalism. Economics is very much an art; it is not only governed by universal rules and micro-level equilibrium fundamentals, but depends crucially on the institutions, habits and customs of each national context. This explains why the language of short-run equilibrium, the neglect of production development policies and the lack of a long-term growth strategy have caused many developing countries to fall into a phase of secular stagnation in recent decades, resulting in a growing deterioration of governance. The theoretical contributions of the new classical economics, based on an abstract view of the economy that prioritizes rational expectations and the logic of the invisible hand, have not yielded the expected results in countries where Gabriel García Márquez's magic realism seems much closer to reality than Robert Lucas's long-term Walrasian equilibrium.

IV. Digital industries, bioeconomics, artificial intelligence: towards a new production paradigm

In parallel to the process so far described, a new and unexpected phenomenon has emerged in the last two decades, associated with a large number of changes at the global knowledge frontier in areas such as biology, genomics, computer science, process digitalization, the use of artificial intelligence and data mining. These changes are cross-cutting and disruptive and do not only affect the industries where the goods and artefacts of these sectors are produced, but rapidly spread to other fields such as banking, health care, consumption patterns and the ways in which individuals interact in society. All this is leading to a new systemic process of transformation of the production, social and institutional framework.

As part of this process, agriculture, animal husbandry, fruit growing, mining, forestry and numerous service production sectors such as health care, banking, e-commerce and many others have proceeded towards digitalized and networked processes of production organization. Knowledge-intensive services are beginning to develop in primary activities that include the production of seeds, vaccines and bioproducts in agriculture, genetic improvement in animal husbandry, the use of sensors and digital data management equipment in mining, improvements in water and energy use, the gradual spread of traceability techniques in many primary production processes, new transport techniques associated with electromobility, and much more. This is a dynamic process involving the emergence of new cross-cutting technologies that are gradually being incorporated in different areas of the production structure and lead to new forms of corporate and consumer behaviour in many different sectors of economic activity.

It is understandable that this pattern of production and social transformation could not have been part of Schumpeter's vision of the creative destruction process that characterize capitalism when he was writing in the 1930s. Theory did not pay much attention to natural resources at that time, or to services. These sectors were thought in those years to be low productivity activities and unresponsive to technological change. Moreover, the concept of the resource curse arose in the 1970s, the thinking being that an abundance of natural resources can lead to Dutch disease episodes, to exchange-rate appreciation and to structural dualism in the production structure of the economy.

Today it is understood that this macro-level view fails to encompass the profound micro-level implications of the changes referred to, which are penetrating the models used to organize production in industries not previously considered to be innovative. This means that there is now a need to look at these issues from a much more systemic perspective and to think of industrial activities as being more strongly interrelated with natural resources and services, blurring boundaries that until recently seemed insurmountable. The industrialization of natural resources means that industry and services are now tending to combine and complement each other. This has crucial analytical implications, demanding consideration of what industrialization is all about.

The appearance of new science-based ways of producing commodities, of bringing to market new products based on organic processes and green technologies with a lower environmental impact, and of incorporating artificial intelligence and data mining has made it possible to map out a vast territory of possible future changes in the production structure. Thus, the understanding of what the boundaries of the industrial sector actually are has been enriched and new paths are opening up for potential access by knowledge-intensive small and medium-sized local enterprises as providers of digital services and process technologies tailored to each particular model of production organization. Of course, all this is neither automatic nor straightforward, but requires a profound institutional transformation and the creation of new technological capabilities and regulatory agencies to accompany the spread of the new biodigital paradigm. This once again brings to the fore the role of the State as a promoter and regulator of growth and as a builder of the new institutions required for the transition to twenty-first century production organization models. This is an institution-building process that each society will undoubtedly have to undertake within the framework of its own history and political circumstances, but which developing nations will at some point have to go through.

All the above reinforces the idea that the new biodigital paradigm is an open-ended process which involves a wider notion of what manufacturing production is all about. We do not need to abandon the idea of industrialization as such, but we do need to incorporate the notion that biotechnologies, genetics and the digital industry open up a vast array of new opportunities to produce high value added products and services in each country, thereby diversifying the production structure and generating quality jobs, even in commodity-based activities (Bisang and others, 2006; Anlló and Bisang, 2015).

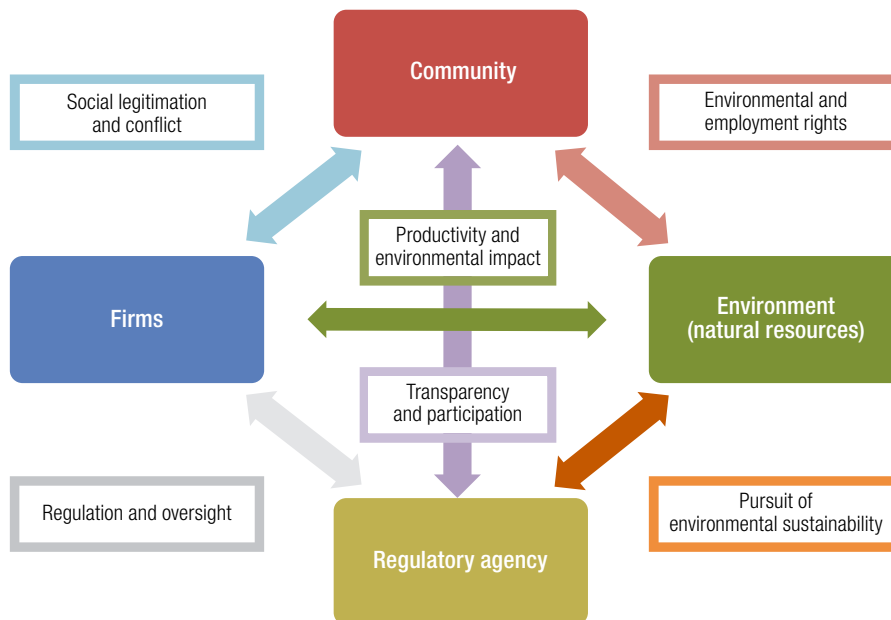
The need for local suppliers of equipment and engineering services is perhaps one of the central features of the new organizational model for the future. What is required is not to think that importing technology from abroad is the only possible alternative, but to consider that building a local base of subcontractors for engineering services and the provision of technological know-how tailored to the different local settings opens up a wide range of new opportunities. Local engineering companies are moving ahead with the installation of pilot plants to experiment and to develop process improvements, and are building prototypes with a view to more efficient substitution and maintenance of imported equipment, automation of tasks right along the production line and adaptation of new techniques to local conditions. It is in this field that countries' technological density is gradually increasing and the technological sophistication of peripheral societies is growing and will continue to do so in the future. It is local engineering SMEs employing biologists, chemical and hydraulic engineers, soil specialists, environmental sustainability technologists, vaccine geneticists, water stress specialists and many others that need to move ahead with the creation of new process know-how and the design of the equipment needed to establish new production sectors.

The transformations associated with biotechnology, genetics and the use of digital technologies in the field of natural resources are making it possible to advance along paths which were difficult to imagine only two decades ago, but which reveal the enormous vitality of the new production paradigm taking shape in these segments of the production matrix. New fields for adaptive innovation are appearing, as are fresh opportunities for local high-technology SMEs that could open up new

niches in world markets on the basis of a new paradigm that is still in its infancy. Local universities and technical schools should be supported in encouraging the training of technicians and professionals in these new fields and facilitating the emergence of local enterprises that can gradually make their way into these activities. National development banks must once again play a crucial role in financing such programmes, as they did in the post-war years. Although the structural transformation process is still very incipient, the expansion of this modern segment of the production matrix seems to be moving ahead at a significant pace.

Natural resource-based sectors are shaped by a logic of dynamic interdependence among the firms that exploit the resource, their suppliers of intermediate inputs and engineering services, State regulators overseeing these companies and monitoring their environmental impact, and the local community where the resource is exploited. This logic is quite different from the neoclassical logic of the isolated producer that operates on the basis of an arm's-length relationship with its competitors and suppliers and responds exclusively to price signals. This dynamic interdependence is graphically depicted in diagram 1.

Diagram 1
Dynamic interdependence in natural resource-based industries

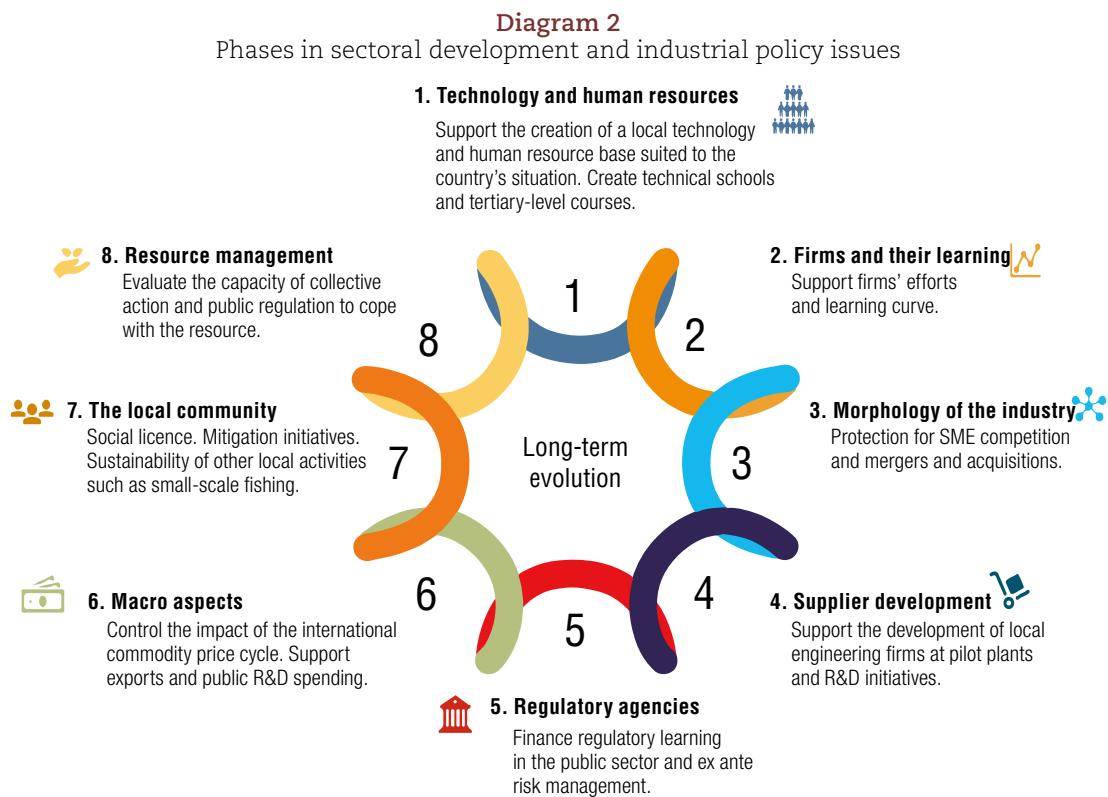


Source: Prepared by the author.

These industries follow a development path in which all the agents involved in the production chain undergo learning processes and accumulate technological capabilities over time. This gradually shapes changes in market structure and in firm and industry behaviour.

This evolutionary process requires a variety of public goods and an appropriate design of sectoral industrial policies that take into account the needs of the industry, starting with access to the initial package of technological know-how and the qualified human resources needed in the start-up period. Thereafter, the focus shifts to support for the development of local engineering subcontractors, the construction of pilot plants and research infrastructure, an appropriate regulatory framework that secures competition and the displacement of SMEs, and environmental oversight bodies that safeguard the sustainability of the natural resource over time and monitor the sector's impact on the biosphere.

Schools, medical posts, road infrastructure and digital connectivity are also required, since production in these industries is usually carried out in remote regions that lack such services. In other words, industrial policy should be conceived as a sequence of stage- and location-specific interventions to resolve the changing needs that arise in the process of growth of these activities. One possible way of representing this idea is shown in diagram 2.



Various public goods are required in each of these areas

Source: Prepared by the author.

This logic of evolutionary growth phases advanced here is closely related to the Schumpeterian narrative of innovation as a transformative force in capitalism. Although Schumpeter does not concern himself with natural resources as such, it can be intuitively understood that his analytical logic provides a useful tool to look at what is beginning to happen in peripheral capitalism at the dawn of the twenty-first century on the basis of science-based industrial organization models in the area of natural resources and in the provision of digital services.

This is a production paradigm that is just beginning to emerge in peripheral countries. Both adopters of the new processes and producers of digital equipment and services have a long way to go before it will be possible to speak of a consolidated production paradigm. The process began earlier and has advanced quickly in developed countries, but it is clearly beginning to take shape in countries such as Argentina, Brazil, Chile, Colombia, Mexico and Uruguay as well, albeit with something of a lag relative to the international technological frontier. Nevertheless, these countries have made remarkable progress in the last decade, with many locally owned SMEs participating. The small size of these companies is still a limiting factor in their ability to compete with the large transnational firms that sell engineering services or with Chinese or Indian companies, which have entered the field in more recent years. This highlights the need to look at the issue from the perspective of the infant industry theory that indicates

that these new activities demand support during the learning and installation process until they mature. The presence of large international engineering companies in these markets undoubtedly poses a serious threat to the development and consolidation of local companies capable of competing with them. However, the greater versatility of the latter in adapting to local needs gives them a major comparative advantage over large international companies that only offer generic technology packages and have little incentive to adapt them to the specific requirements of each particular context.

V. Looking ahead: stagnation and growing poverty, new disruptive technologies, uncertainty, new players in the global economy and a deteriorating domestic governance environment

The picture presented so far provides a broad outline of the situation facing developing countries today. Three main topics have been highlighted. First, the stagnation of the manufacturing sector that these countries have been experiencing since the debt crisis. We argue here that this has resulted from the lack of a long-term production and technological development strategy and the consequences of having uncritically pursued short-term fiscal and financial equilibrium macro management of the economy.

Second, the impact of the transition to Industry 4.0 industrial organization models associated with process automation and digitalization, robotics, the use of artificial intelligence and other technological modernization processes. The transition has already started in many developing countries. Although it has so far only been implemented by a small group of firms in countries such as Argentina, Brazil, Chile, Colombia, Mexico, Peru and Uruguay, it appears to be an irreversible phenomenon which demands careful examination and public sector support for the future.

In addition to the two above-mentioned themes, a third topic that demands urgent consideration is how to recover from the recent COVID-19 health crisis. A clear priority is to revitalize primary health-care teams, improve the provision of vaccines and medicines, reinforce the physical infrastructure of hospitals and health centres and restore the morale of medical and paramedical staff, which has deteriorated considerably in recent years. These matters will undoubtedly require huge State expenditures in countries where public finances are clearly under severe strain.

Together with the above, there is an urgent need to modernize and upgrade the competitive capabilities of the domestic production structure to advance new production activities catering for the new consumption patterns that are emerging in world markets, the transition towards renewable energy sources, appropriate management of water resources, and progress with electromobility and the decarbonization of production processes.

This division between urgent issues that require action in the short and medium term and structural issues that should be addressed in parallel but with a longer-term perspective prompts reflection on the need to restructure the role and size of the State and to build new institutions that can revitalize investment and support the accumulation of domestic technological capabilities. The available resources are clearly insufficient, so there is need of a new social covenant that could involve fiscal and tax reform capable of providing long-term financing to ensure economic growth based on a more equitable path with greater social inclusion. A central element of this whole process is that the new social covenant must be geared towards improving democratic governance and the narrowing of the gap between the modern segment and the segment that is lagging behind, which is characterized by extreme poverty and social exclusion.

This brings us back to the central topic of the role of the State in the economy and the need for new models of public-private cooperation that could simultaneously act to reduce the inequality gap that has opened up in society and the productivity stagnation that has significantly damaged competitiveness in global markets, while aiming for the long-term transformation of the production structure. It clearly brings out the role for the State in creating new institutions, expanding expenditure on R&D programmes, funding innovation and supporting the development of domestic technological capabilities in SMEs, while implementing policies to reduce poverty and social exclusion. In a context where the functioning of competition rules is heavily affected by market failures associated with collusion among firms, tax evasion and the capture of public resources by large corporate groups, the right way to advance towards a more cooperative public-private programme of future action that can secure permanent, long-term resources to address the vast array of issues that need to be dealt with, becomes a major question. How to develop trust and mutual cooperation among sectors of society that are more prone to confrontation than to accepting an honest dialogue with each other, is clearly the central question that remains unanswered in the developing world in the quest for a better future.

Bibliography

- Anlló, G. and R. Bisang (2015), *Bioeconomía, cambio estructural y respuestas globales: una ventana de oportunidad para las producciones basadas en recursos naturales renovables*, Buenos Aires, Ministry of Agriculture, Livestock and Fisheries.
- Bisang, R. and others (comps.) (2006), *Bioteología y desarrollo: un modelo para armar en la Argentina*, Buenos Aires, National University of General Sarmiento/Prometeo Libros.
- Hicks, J. (1937), "Mr. Keynes and the 'classics'; a suggested interpretation", *Econometrica*, vol. 5, No. 2, April.
- Keynes, J. M. (1936), *The General Theory of Employment, Interest and Money*, London, MacMillan.
- Lucas, R. E. and E. C. Prescott (1971), "Investment under uncertainty", *Econometrica*, vol. 39, No. 5, September.
- Lucas, R. E. and L. A. Rapping (1969), "Real wages, employment, and inflation", *Journal of Political Economy*, vol. 77, September–October.
- Lucas, R. E. and T. J. Sargent (1978), "After Keynesian macroeconomics", *After the Phillips Curve: Persistence of High Inflation and High Unemployment*, Conference Series, No. 19, Federal Reserve Bank of Boston.
- Schumpeter, J. (1942), *Capitalism, Socialism and Democracy*, New York, Harper & Brothers.
- (1939), *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*, New York, McGraw-Hill.
- Solow, R. (1988), "Growth theory and after", *American Economic Review*, vol. 78, No. 3, June.