

The role of services in economic development and the core-periphery relationship¹

Wallace Marcelino Pereira, Fabrício José Missio
and Frederico Gonzaga Jayme Jr.

Abstract

The literature on productive structure and economic growth shows the relevance of industry in expanding gross domestic product (GDP) in developed and developing countries. Recent studies suggest that the modern services sector (professional services) contributes to innovation, increased productivity, and, consequently, economic growth. This paper presents a theoretical discussion on the importance of the modern services sector for Latin America in order to update the central thesis of the Latin American structuralist approach. The data suggest that even in the context of a productive transformation characterized by a fall in the share of manufacturing and the rise of the services sector, international division of labour is perpetuated, based on the centre-periphery relationship. The results show that structuralist thinking is adequate to explain the persistent underdevelopment of Latin American countries from a perspective focused on the service economy.

Keywords

Economic development, service industries, deindustrialization, industrial development, structural adjustment, economic dependence, economic indicators, Latin America

JEL classification

O1, O2

Authors

Wallace Marcelino Pereira is a Lecturer at the Economics Department of the Institute of Applied Social Sciences of the Federal University of Pará, Brazil. Email: wmpereirabr@ufpa.br.

Fabrício José Missio is a Lecturer at the Economics Department of the Center for Regional Development and Planning (CEDEPLAR) at the Federal University of Minas Gerais, Brazil. Email: fjmissio@cedeplar.ufmg.br.

Frederico Gonzaga Jayme Jr. is a Lecturer at the Economics Department of the Center for Regional Development and Planning (CEDEPLAR) at the Federal University of Minas Gerais, Brazil. Email: gonzaga@cedeplar.ufmg.br.

¹ The authors wish to acknowledge the financial support received from the National Council for Scientific and Technological Development (CNPq). The authors also thank Pedro Mendes Loureiro, Lecturer at the Centre of Latin American Studies at the University of Cambridge, for his comments and suggestions.

I. Introduction

This paper analyses a theoretical discussion on the importance of the modern services sector for Latin America and proposes to update the central thesis of the Latin American structuralist approach. The world today is characterized on the one hand by developed countries that produce sophisticated services, which are technology-intensive and highly integrated with other sectors of the economy, and on the other hand by a group of (underdeveloped) countries that produce low-technology services, which are not very competitive internationally and are aimed at the domestic market. This represents a new stage of structural change that reinforces the centre-periphery dichotomy.

The paper innovates by reviving and revisiting the debate on economic growth in Latin American countries at the Economic Commission for Latin America and the Caribbean (ECLAC), placing the modern services sector at its centre.

The literature on economic growth shows the relevance of industry in the expansion of GDP in developed and developing countries. The manufacturing industry is the engine of this process owing to increasing returns to scale, which generate rises in productivity and, as a consequence, the growth of per capita income. In the case of developing countries, industrial expansion promotes a series of structural changes, with a production structure characterized by specialization and sectoral heterogeneity (Furtado, 1961; Kaldor, 1966; Thirlwall, 2002).

Recent studies suggest, however, that increasing the share of the modern services sector contributes to innovation and increased productivity, with positive effects on economic growth (Miles, 2008; Muller and Zenker, 2001; Pilat and Wölfl, 2004). These studies explore the possibility of interaction between the services sector and industry. Indeed, technological spillovers, generated by the modern services sector and connected with the high-tech industry, boost productivity and growth in the manufacturing industry.

The discussion on the role of the service sector arises amidst a relative loss, in developed countries, in the industrial sector share of total GDP beginning in the 1970s. For this group of countries, singularity was considered natural and typical of those that reached industrial maturity (Rowthorn and Ramaswamy, 1999; Palma, 2005, 2008 and 2019).

In Latin America, an identical experience has been observed since the mid-1980s. However, this process is precocious, as the share of manufacturing as a percentage of GDP began to recede before these countries reached the per capita income level of developed countries or were capable of creating an “endogenous nucleus of technical progress”, a concept proposed by Fajnzylber (1983).²

For developed countries, this relative loss of industry share in GDP has resulted in the rise of a modern services sector whose activities are integrated into the industrial sector, and which is intensive in skilled labour and focused on the foreign market. In this set of activities, there is a continuous process of technological innovation and productivity improvement.

In underdeveloped countries, on the other hand, deindustrialization has happened concomitantly with the expansion of the not-very-competitive traditional and modern services sector. Service activities are not very knowledge-intensive and their contribution to the productivity of industry and to the economy as a whole is limited or nil.

To fulfil its objective, this article is structured into three sections, in addition to the introduction and the conclusions. Section II presents a synthesis of structuralist thinking and section III discusses the phenomenon of deindustrialization and the emergence of the service sector. Finally, section IV presents an analysis of the dynamics of modern services in the centre-periphery relationship.

² An “endogenous core of technical progress” can be understood as the result of the establishment of a strategy that coordinates the resource and knowledge potential of each country, in certain sectors, to promote a new pattern of industrialization. For more details, see Fajnzylber (1983, pps. 374 and 375).

II. Latin American structuralism

In the mid-1950s in Latin America, mainly through ECLAC, authors such as Raúl Presbich, Celso Furtado, Anibal Pinto and Osvaldo Sunkel conducted studies to understand the economic problems of Latin American countries.³ A common point in these reviews was criticism of the neoclassical theory of international trade, based on comparative advantages, which holds that the outcome of technical progress is shared among countries.

As argued by the aforementioned authors, the reality showed a different picture, with a clear advantage for industrialized countries (the centre) compared to countries that exported primary goods (the periphery). According to the concept of deterioration of terms of trade, part of the technical progress of the second group of countries was transferred to the first. In the words of Prebisch and Cabañas (1949), “while the centers fully preserved the outcome of the technical progress of their industry, the peripheral countries transferred to them a part of the outcome of their own technical progress”. Heterogeneity between productive structures is one of the explanations for this asymmetry in relation to gains resulting from international trade, as well as in relation to the level of development of these two groups of countries.

According to structuralists, that structure was more homogeneous and diversified in developed countries, while in peripheral countries it tended to be heterogeneous and specialized, in general, with a modern sector that exported one or a few natural commodities (Prebisch and Cabañas, 1949; Pinto, 1965 and 1970; Cimoli and Porcile, 2013).

Prebisch and Cabañas (1949) identified the biggest problem in the periphery as heterogeneity in the levels of sectoral productivity. Production specialization tended to generate recurring pressures on the balance of payments. The solution lay in the development of industry as a way to capture the outcome of technical progress and improve the population’s standard of living (Prebisch and Cabañas, 1949; Furtado, 1961; Rodríguez and others, 1995; Rodríguez, 2009).

For Furtado (1961), the key factor for the development of capitalism was technological progress, which occurs through the incorporation and dissemination of new techniques, the result of which is to increase production and productivity. In developed countries, higher real wages led the economic system to develop technological innovations aimed at replacing labour with capital. Thus, the “technical progress of the developed economies has resulted in a gradual increase in the amount of capital per unit of labor and in a relative homogenization of capital density in the various productive activities” (Rodríguez, 2009).

However, there were structural problems in the industrialization process in Latin American countries. Among them were the following: (i) a low capital-to-worker ratio, the cause of low labour productivity; (ii) the absence of a sector producing capital goods; and (iii) little diversified (specialized) production, which, instead, focused on goods with low technological content (Furtado, 1961).

Thus, opportunities for autonomous industrialization in the periphery are limited. Domestic production is concentrated almost exclusively on the production of consumer goods and/or simpler products. Industrial producers tend to absorb only technological innovations that provide the best productive capacity domestically (Furtado, 1969).

The result is that peripheral economies have developed activities with a reduced level of technical progress, which limits the development of higher degrees of intersectoral complementarity and the vertical integration of production. The “initial specialization and the pattern of industrialization generated on this basis bring with it a slower pace of technical progress in the periphery” (Rodríguez, 2009).

³ For a general and systematic approach to Latin American structuralism, see Bielschowsky (1998), Rodríguez (2006 and 2009) and Torres (2019), among others.

For Furtado (1961), industry in the periphery tends to reproduce the external productive pattern, while developed countries internalize and disseminate new technologies, develop the capital goods industrial sector and spread technology to all economic sectors. The periphery remains dependent on imported technology, as it is unable to generate an endogenous technological development process.

On the one hand, a productive arrangement on the periphery leads to the adoption of imported technology that is not suited to the structural standards of society. On the other, it generates a low-growth dynamic in which it is impossible to minimize external account imbalances (Furtado, 1961). The pressures on the balance of payments become recurrent, given that the modernization of domestic industry occurs through the adoption and updating of standards and techniques systematically acquired from developed countries (Furtado, 1961; Albuquerque, 2007).

An attempt by peripheral countries to break with this cycle of dependency and low growth gave rise to the so-called “import substitution industrialization (ISI)” model, or, according to the definition of Bértola and Ocampo (2012), the model of “state-driven industrialization”.⁴ The essential part of this strategy was the diagnosis of the need to reduce external dependence through the domestic production of manufactured products. The State was given a fundamental role in this process.

The actions and programmes undertaken in Latin America throughout this period and as part of this diagnosis are well known. Although with some lack of consensus, the results are also well known. According to some authors, the result of this development strategy can be considered as late and backwards in relation to Europe, reflecting a series of cyclical determinants and the dynamics of capital accumulation (Tavares, 1972).

However, even after a long effort to bolster industrialization, the centre-periphery relationship has not been overcome. Technological dependence and productive heterogeneity remain a characteristic of peripheral economies. Furthermore, in addition to these bottlenecks, short-term macroeconomic problems linked to fiscal balance and inflationary stabilization have been added. The next phase of the ECLAC school sought to address some of these problems in its analysis.

1. Neostructuralism

By the end of the 1970s, the legacy of the Latin American ISI model and the success of Asian industrialization based on a strategy of import substitution with export-led growth had contributed to the decline of the traditional ECLAC model. Policies based on the Washington Consensus occupied the economic agenda during the 1990s. However, the adoption of neoliberal recommendations resulted in a series of social and political problems, which enabled a theoretical reorganization based on neo-structuralism.⁵

The neostructuralist approach has advanced in relation to the old ISI model (ECLAC, 1990). Despite rescuing elements of the old structuralism, this new phase of Latin American structuralist thinking incorporates new strategies for conducting economic policy, proposing an economic model based on the idea of *systemic competitiveness*.

This economic model is sustained by State-managed competition, the construction of productive structures, the defence of fiscal balance, and macroeconomic stability and trade liberalization (Ffrench-Davis, 1988; ECLAC, 1990 and 1998; Ramos and Sunkel, 1993; Gwynne and Kay, 2000). The new formula stems from the finding that Latin American countries have bottlenecks associated with macroeconomic imbalances, obsolete industrial plants and technological backwardness (ECLAC, 1990 and 1998; Rodríguez, 2009; Missio and Jayme, 2012).

⁴ Bértola and Ocampo (2012, p. 151) argue that state-driven industrialization is a more precise concept because it highlights two defining characteristics: the growing focus on industrialization as a pillar of development and the significant expansion of the State's spheres of action in economic and social life.

⁵ For a systematic approach, see Bielschowsky (2010) and Ffrench-Davis and Torres (2021), among others.

According to Missio and Jayme (2012), under that approach, the State and the market are considered partners and the objective is to create the conditions for productive competitiveness and equity. In the 1980s, after the crisis at the beginning of the decade, the State had prioritized servicing the external debt, but the new proposal prioritized stimulating the development of the capacities required to incorporate technical progress and to minimize inequalities (ECLAC, 1990, 1998 and 2018).

To meet the proposed objectives, macroeconomic balance, supported by fiscal balance and countercyclical policies, is a *sine qua non* condition for development (Ffrench-Davis, 1988; Missio and Jayme, 2012). Fiscal consolidation must be compatible with the ability to deal with economic fluctuations of internal or external origin (ECLAC, 1998 and 2018).

According to Titelman and Pérez Caldentey (2015), cyclical trends in Latin America and the Caribbean are asymmetrical in duration and breadth. In this sense, to minimize the sharp fall in investment and negative effects on the pace of productivity and therefore on the long-term growth rate, macroeconomic policies need to strengthen countries' capacity to mitigate the effects of recessions on the productive structure.

In other words, fiscal balance and macroeconomic stability are essential for the State to be able to make the necessary investments in infrastructure, health and education and to control inflation, although the fundamental countercyclical function of fiscal and monetary policies cannot be neglected (Missio, Jayme and Oreiro, 2015). Thus, it becomes possible, in the long run, to reduce social inequality and to encourage the productive transformation necessary for economic development (ECLAC, 1990).

Finally, integration with international markets is another key element in this approach. Greater economic openness would enable access to the new technology trends incorporated in goods and services and would expand access to foreign investment (Missio and Jayme, 2012). As Rodríguez (2009) argues, neostructuralism recognizes the existence of a technological revolution in full swing, which itself is accompanied by an intense process of globalization. For neostructuralists, any long-term development strategy must consider both productive coordination policies and technological progress.

Specifically, from the standpoint of the generation and dissemination of technology, Fajnzylber (1983 and 1990) argues that the bottleneck for technical progress and productivity stems from the absence of an "endogenous core of technological dynamism", without which it is impossible to overcome underdevelopment. Policies to encourage the capital goods sector should be promoted, since that sector is capable of endogenizing and disseminating technological progress to other sectors.

However, despite the more precise diagnosis of the productive transformations necessary for development, the feasibility of the neo-structuralist agenda can be questioned in the light of two factors: (i) the deindustrialization movement underway in both developed and developing countries; and (ii) the emergence of new dynamic sectors. In relation to the last point, the emergence of the service sector is worth mentioning.

A series of productive changes is currently under way in the composition of employment and in intersectoral relationships. These transformations are broader and faster-paced than in past decades. Structuralist thinking did not sufficiently incorporate this new context into its discussions. As we will show below, these new themes have been widely discussed in the literature. Furthermore, we argue that an understanding of these new processes that induce structural change is vital for understanding the new paths that are opening up for development. That understanding is also essential for making sense of the new stage of the centre-periphery relationship that is outlined.

III. Industrial regression, deindustrialization and the service sector

Beginning in the 1970s, developed countries started to suffer a systematic decline of industry as a share of GDP. Rowthorn and Ramaswamy (1999) note that deindustrialization is a phenomenon marked by a continued reduction in the share of industrial employment in the total employment of a given country. Palma (2005, 2008 and 2019) argues that deindustrialization is marked by the fall, in relative terms, of industrial employment, and subsequently in absolute terms, while the service sector becomes the main source of labour absorption.

For Tregenna (2008), this can be understood as a process in which not only industrial employment but also the value added of industry is reduced, in relation to total employment and GDP, respectively. In this sense, an economy becomes deindustrialized when the industrial sector loses importance as a source of employment and/or value added, so that the expansion of industrial production does not explain the lack of deindustrialization (Oreiro and Feijó, 2010).

The loss of the role of industry in GDP also occurred in Latin American countries in the mid-1980s. The scenario was completely different, marked by extremely low global growth rates, external and fiscal crises and a deterioration in the State's ability to intervene (Ocampo, 2008; Oreiro and Feijó, 2010). According to Salama (2012), among the countries most affected were Brazil, Argentina and Mexico, although the latter has adopted a "*maquila*" strategy to mitigate the deleterious effects of deindustrialization.

Flagging economic growth since the mid-1980s comes in addition to the poor performance of the service sector. The pattern of specialization in the list of service exports is very different between developed countries and Latin America (Kon, 2006; Busso, Madrigal and Pagés, 2013). It is argued that Latin America has been unable to advance in the modern services sector and that the activities that emerge from structural change do not have the attributes necessary to compete on the international market and fail to contribute to improving economic productivity (Pagés, 2010; McMillan and Rodrik, 2011; Ferreira and Da Silva, 2015).

Thus, there is evidence that the structural change resulting from the process of deindustrialization of underdeveloped countries is complemented by the creation of a service sector based on activities that absorb low-skilled and underpaid professionals, have low technological intensity and limited innovative capability, are unable to competitively participate in the foreign market, and are associated with a new and growing digital economic rent-seeking (Kon, 2006; Cruz and others, 2007; Torres and Ahumada, 2022).

Especially regarding digital economic rent-seeking, Torres and Ahumada (2022) argue that the service companies that began operating in Latin America are the result of global oligopolistic platforms that do not transfer productive capacity to the local fabric and do not provide qualified jobs or capital goods, but rather extract income for the central regions. Therefore, for the authors, this dynamic reinforces the peripheral condition, because innovations from the centre are expressed through the appropriation of income and the externalization of labour and capital costs.

In contrast, the increase in the share of modern services as an intermediate input used by industry in developed countries contributes to the supply of products with sophisticated technological content (Arbache, 2015). Therefore, revalorizing the existing literature on the service sector becomes essential to understanding the new global productive reconfiguration and its effects on Latin America.

1. The emergence of the service sector

Recently, the role of the service sector in growth has been gaining ground in the economic debate. Due to its peculiar characteristics, it has always been considered a residual sector in the economic

literature because it aggregates all activities that do not fall under agriculture or industry. Baumol (1967) developed a theory that became known as the *cost disease*, whereby the growth of this sector implied a reduction in overall economic productivity, due to the replacement in the economy of a dynamic sector (industry) by this less dynamic sector.

However, studies indicate that the economic growth and productivity gains obtained by industry since the 1970s can be explained by the emergence of modern services, especially those resulting from new communication technologies (Aboal and Tacsir, 2015; Nordås and Kim, 2013; Lodefalk, 2014).

The evolution of the service sector in recent decades has made Oulton (2001) question the hypothesis of “*cost diseases*”, arguing that this phenomenon only occurs if there is an increase in the share of final services in value added. The knowledge-intensive business services (KIBS) literature shows that they provide knowledge for the industry and contribute to generating innovation in the industrial sector (Miles, 2005 and 2008; Muller and Zenker, 2001).

Authors like Castellacci (2008), Savona and Steinmueller (2013) and Arbache (2015 and 2016) analysed the interaction between services and the industry and found that, especially for the most technologically advanced products, the number of services incorporated in final value has been increasing. Thus, it is understood that the current stage of the production process is characterized by the sale of products in “packages” that integrate physical production and services, demonstrating that the demand for services in all industrial sectors has been growing (Leshner and Nordås, 2006; Arbache, 2015).

These services can be divided into two types, namely value services and cost services. The former correspond to activities that add value to the production process and increase productivity and return on capital. These services are concentrated in developed countries where the supply of human capital and technological development is greater. Cost services contribute to the competitiveness of companies and increase production efficiency; however, they do not contribute to product differentiation (Pilat and Wölfl, 2004; Arbache, 2015; Giovanini, Pereira and Saath, 2020).

Cost services are found mostly in developing countries, in view of the structural weaknesses of those countries (UNCTAD, 2013; UNESCO, 2015). The literature also shows that the share of services as an input for industry varies between countries, so that demand for modern services tends to be higher in countries with a more technology-intensive industrial structure than in those with an industrial structure characterized by traditional sectors (Acemoglu and others, 2007).

The latest studies on the service sector argue that advanced manufacturing and industry 4.0 is a result of new technologies arising from the interaction between modern services and the industrial sector. It is argued that the new stage of the production system is linked to countries’ capacity to develop modern service activities and that these new technologies will affect the industrial sector and impact countries’ productivity and growth rate (Schuh and others, 2015; Georgakopoulos and others, 2016; Niggemann and Beyerer, 2016; Giovanini and Arend, 2017; Giovanini, Pereira and Saath, 2020; Cadestin and Miroudot, 2020).

In other words, in the current phase of structural change, countries’ growth trajectory depends on the type of service that is developed, its degree of competitiveness and its level of integration with the industrial sector. Some countries will have highly competitive and integrated services in the industrial sector, while others will have serious production deficiencies. This clearly leads to the centre-periphery relationship originally proposed by ECLAC, which is the focus of the next section.

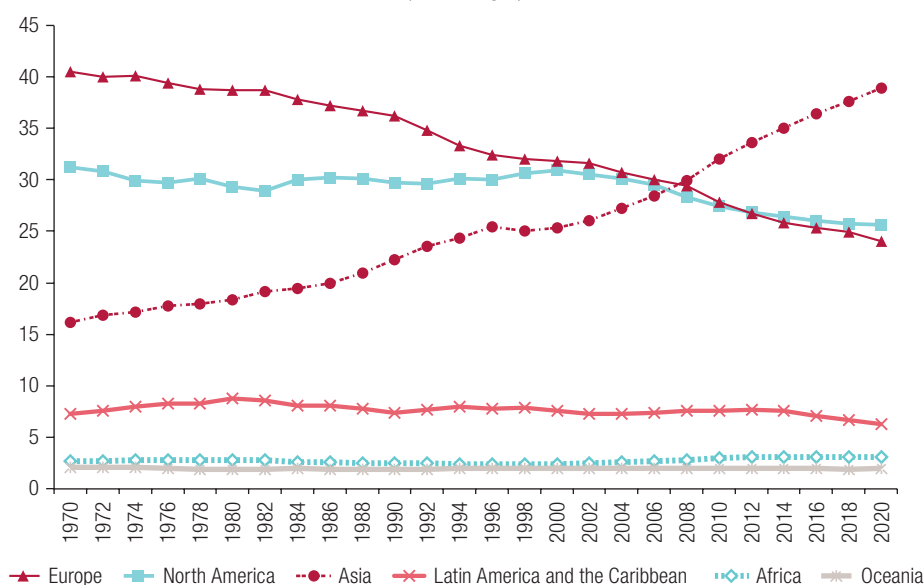
IV. The core-periphery division in the post-industrial context

After the 1970s, deindustrialization in developed countries came with productive redistribution. Each country has positioned itself in the global productive system based on its competitive advantages. This explains why industries with the highest technological content and with modern service activities are concentrated in developed countries. Peripheral countries were left to compete for the production of lower-added-value goods, as the Asian countries initially did, or for the supply of primary goods and some intermediate industrial activities, which is the case for Latin America.

That trend can be seen in figure 1, which shows regional GDP as a percentage of world GDP. Between 1970 and 2017, the global economy was characterized by the existence of two groups of countries. The first group is formed by the countries of Europe and North America (developed countries) and the second group is formed by countries in Africa, Oceania, Latin America and the Caribbean (peripheral countries).

Despite periods of growth in GDP and in total or sectoral employment in less developed regions, only part of Asia has been able to benefit from the global reconfiguration of production that began in the 1970s. The literature shows that State-coordinated industrial and financing policy was decisive for good Asian performance (Rodrik, 1994; Kim and Leipziger, 1997; Dahlman and Sananikone, 1997; Smith, 2000).

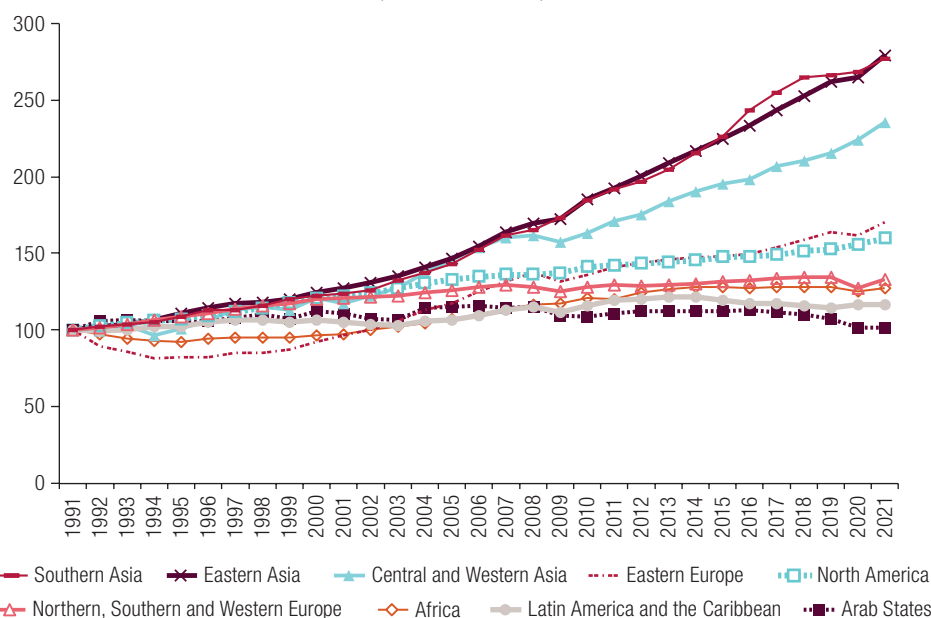
Figure 1
Regions of the world: regional GDP as a share of global GDP, constant 2010 prices, 1970–2020
(Percentages)



Source: United Nations Statistical Division.

Figure 2, which shows the evolution of productivity, helps to explain why Latin America has persistently remained in the group of peripheral countries and also explains the movement of Asian countries towards the group of developed countries. Asian productivity growth rates have risen consistently since the 2000s, while rates in Latin America have remained below those of all other regions.

Figure 2
Regions of the world: productivity, 1991–2021
(Index: 1991=100)



Source: International Labour Organization (ILO), ILOSTAT [online database] <https://ilostat.ilo.org/>.

Since 1990, structural change in Latin America has contributed to lower aggregate productivity, with poor productivity in the service sector being one of the main factors explaining Latin American stagnation (Pagés, 2010; McMillan and Rodrik, 2011). The argument made by Furtado (1961) of low capital per worker and the identification of obsolete industrial plants and macroeconomic maladjustments under neostructuralism contributes to explaining the unfavourable evolution of Latin American productivity.

Especially in Asian countries, integration between industry and the modern services sector ensures high growth and productivity rates (UNCTAD, 2017). The new stage in the process of structural change characterized by the deindustrialization and reconfiguration of intra-sectoral employment may be the key to understanding the weak economic performance of Latin American countries.

1. Modern services, technology and industry as elements of structural change

Table 1 shows growth in the share of employment by sector over the last three decades. Between 1991 and 2000, employment participation in modern services in Latin America did not increase significantly. On the other hand, traditional services related to hotels, restaurants and other personal services grew by 0.85%. At the same time, it is important to highlight the loss of the share of industrial employment in total employment, by approximately 0.80%.

Globally, Asia had the highest growth rates in the modern services sector (communication; financial and real estate intermediation; business services and administrative activities). Eastern and Southern Asia stood out, with average growth rates above 3%.

From 2001 to 2010, the relative share of employment in financial intermediation and insurance activities increased in Latin America, with average annual growth of 6.22%, and was also up in real estate activities, business services and administrative activities, with growth of 2.83%. The pace of reduction in the share of industrial employment in total employment was maintained over that period.

Table 1
Regions of the world: average yearly employment growth, by sector and decade, 1991–2021
(Percentages)

	Region	Manufacturing	Electricity, gas and water supply	Construction	Wholesale and retail trade, accommodation and food service activities	Transport, storage and communication	Financial and insurance activities	Real estate, business and administrative activities	Other services
1991–2000	Africa	-0.81	1.23	0.31	1.07	1.57	0.49	3.89	0.47
	Latin America and the Caribbean	-0.78	-2.33	0.58	0.85	0.72	-0.35	2.56	0.29
	North America	-1.46	-1.92	1.14	-0.07	0.06	0.09	1.94	0.08
	Eastern Asia	-0.18	-0.32	2.17	3.44	3.22	3.33	4.77	3.38
	Southern Asia	-0.06	-0.46	3.13	2.88	3.12	3.16	6.20	-1.29
	Northern, Southern and Western Europe	-1.80	-2.94	0.44	0.15	0.99	0.53	2.96	1.99
	Eastern Europe	-1.84	0.91	-3.49	2.41	0.26	1.67	2.17	-1.08
	Central and Western Asia	-0.82	0.55	-0.33	2.40	1.42	2.83	3.44	0.99
	Arab States	-0.03	-3.98	-0.54	1.35	-0.07	0.98	2.02	0.21
2001–2010	Africa	-0.63	1.71	3.53	1.49	1.55	0.73	5.12	2.08
	Latin America and the Caribbean	-1.13	0.92	1.45	0.54	1.26	6.22	2.83	-0.64
	North America	-2.78	1.83	-0.08	-0.39	0.11	-0.23	1.21	0.39
	Eastern Asia	1.20	2.48	4.73	2.03	1.88	2.88	5.73	1.89
	Southern Asia	0.66	0.29	6.53	1.36	2.59	3.98	5.63	-0.28
	Northern, Southern and Western Europe	-2.85	6.40	-0.27	0.02	0.90	-0.24	3.70	0.15
	Eastern Europe	-1.68	3.58	3.23	1.97	2.11	2.73	5.39	-2.99
	Central and Western Asia	0.10	2.52	3.03	1.02	1.79	1.70	6.67	2.53
	Arab States	-0.14	3.54	2.67	1.62	1.77	4.14	4.83	2.00
2011–2021	Africa	0.27	2.70	1.78	1.06	1.25	1.00	3.21	0.53
	Latin America and the Caribbean	-0.76	1.13	0.39	0.16	0.51	0.74	1.94	-0.84
	North America	-0.73	-0.19	0.93	-0.76	1.42	0.39	0.58	-0.42
	Eastern Asia	-0.95	0.46	1.96	2.23	2.35	3.01	4.77	1.75
	Southern Asia	0.70	5.96	2.22	1.36	1.12	1.59	6.57	0.22
	Northern, Southern and Western Europe	-0.45	0.55	-1.31	-0.55	0.83	-0.11	1.16	0.06
	Eastern Europe	-0.12	0.09	-0.25	0.40	0.87	0.69	1.83	1.73
	Central and Western Asia	0.53	2.09	0.82	0.38	0.67	1.43	2.90	-1.04
	Arab States	-0.90	-0.29	-0.66	0.70	0.74	0.43	2.66	2.43

Source: International Labour Organization (ILO), ILOSTAT [online database] <https://ilostat.ilo.org/>.

On the other hand, average annual growth rates for employment in the modern services sector in Asia were over 2.5%. During this period, employment also grew in the Asian manufacturing sector. Europe and North America did not see significant growth in the percentage share of employment in service activities, except for Eastern Europe, where the rate was over 5% in real estate and in business and administrative activities. Northern, Western and Southern Europe had the second-best performance, with growth rates above 3% for both real estate and business and administrative activities.

Between 2011 and 2021, the modern services with the highest employment growth rate in Latin America were real estate activities, business services and administrative activities, at 1.94%.

Other service activities saw a major decline. The second-highest growth was observed in the activity of public utility services, such as electricity and gas, which grew by 1.13%, while industrial employment decreased slightly (-0.76).

Between 2011 and 2021, average annual growth rates in Eastern and Southern Asia for modern service activities were positive again, at over 2.3%. Average annual growth for industrial employment in Southern Asia was 0.70%. Over the same period, growth in Europe and North America was negative, in a context of constraints. The highest relative employment growth rates were found in Eastern Asia, Southern Asia and Central-Western Asia, in real estate activities and in business services and administrative activities, with a rate that exceeded 2.5%.

Considering the share of sectoral employment in relation to total employment, the evidence suggests different trajectories between Latin America and some Asian countries (those in Eastern Asia and Southern Asia), which confirms the proposition that structural change in Asia contributed to productivity growth (Pagés, 2010; McMillan and Rodrik, 2011). Asian countries stood out in the most technology-intense modern service activities throughout the period analysed. In Latin America, real estate activities, business services and administrative activities performed better. Furthermore, modern Latin American services only performed well between 2001 and 2010.

The evolution of Asian employment suggests that, as these countries advance in incorporating knowledge and training skilled labour in modern service activities, they are joining the group of countries that are important exporters of modern services (Pagés, 2010; UNCTAD, 2017).

That evolution reflects the international division of labour and the relative position occupied by the regions. As previously seen, information and communications technologies (ICTs) have made it possible to accelerate trade and decentralize productive activities, enabling the development of global value chains. Recent studies by the Organisation for Economic Co-operation and Development (OECD) suggest that efficient integration into global value chains can be an important element for increasing productivity levels (OECD, 2013; Kowalski and others, 2015).

Thus, investigating how Latin America participates in global value chains and which sectors are most important contributes to assessing the region's performance. ECLAC (2018) showed that the share of raw materials in exports of minerals and metals in the region has almost doubled in the last 20 years. At the same time, there is a decline in the share of finished products and, to a lesser extent, in semi-finished products. The region is present in the early stages of value chains, losing participation in links with higher levels of processing along those chains (ECLAC, 2018).

The relative position of Latin America in global value chains can also be assessed through two indicators, the *backward global value chain integration ratio* (share of foreign value added incorporated in a country's gross exports) and the *forward participation ratio* (value added of a country used by its foreign partners). The sum of the two indicators shows the country's participation in global value chains. Figure 3 shows the backward global value chain integration ratio by sector.

Southern and Eastern Asia have specialized primarily in the downstream segments (backward links) of global value chains, and those regions supply foreign inputs at above-average rates in comparison with the rest of the world. Foreign content is high in exports from Eastern Asia in virtually every sector, including those linked to modern services.

Likewise, there is a relatively high level of foreign content in European exports of telecommunications, financial intermediation services and computers and related activities. The sectoral share in global value chains of Latin America and North America (the United States, Canada and Mexico), however, was below average for most of the sectors analysed. In the first group of countries, the agricultural and mining sectors were the exception. Latin American service activities do not incorporate large amounts of foreign content (see figure 3).

Figure 3
Regions of the world: average backward global value chain integration ratio,
by sector, 1995–2018
(Percentages)



Source: Organisation for Economic Co-operation and Development (OECD), "Trade in value added" [online] <https://www.oecd.org/sti/ind/measuring-trade-in-value-added.htm>.

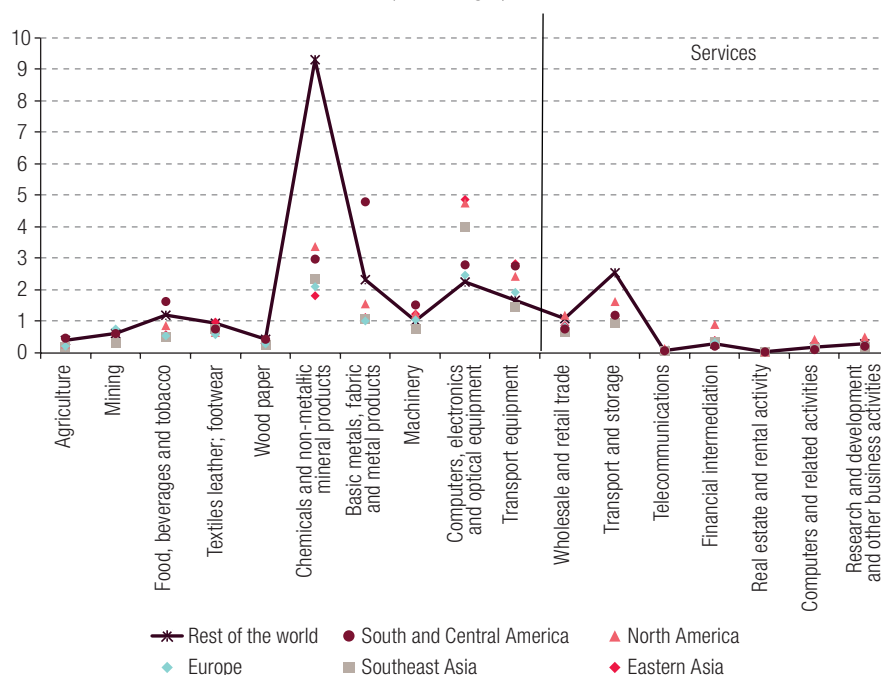
On the other hand, modern services from Europe and North America (especially the United States) are primary sources used by other countries. This shows that even though Asian countries have caught up and have a strong share of service exports, the United States and Europe are leading in the dissemination of technical progress related to services.

The forward sectoral participation rates (see figure 4) show that Latin America stands out for having relatively strong links in sectors based on natural resources, food and transportation equipment. In other words, the region is basically a supplier of primary goods and products with low technological content. In addition, the region's services are not used by other countries in production chains. In fact, a strong correlation can be seen between the productive structure and sophisticated services, meaning that the productive structure is central to understanding structural change in the countries.

During today's transformation of production as during the phase of industry-led growth, central countries are playing the leading role in producing modern services. These countries disseminate technical progress through the service area and combine innovations, when necessary, with industrial products, aiming to ensure greater productivity and global leadership in production (Savona and Steinmueller, 2013; Arbache, 2015 and 2016).

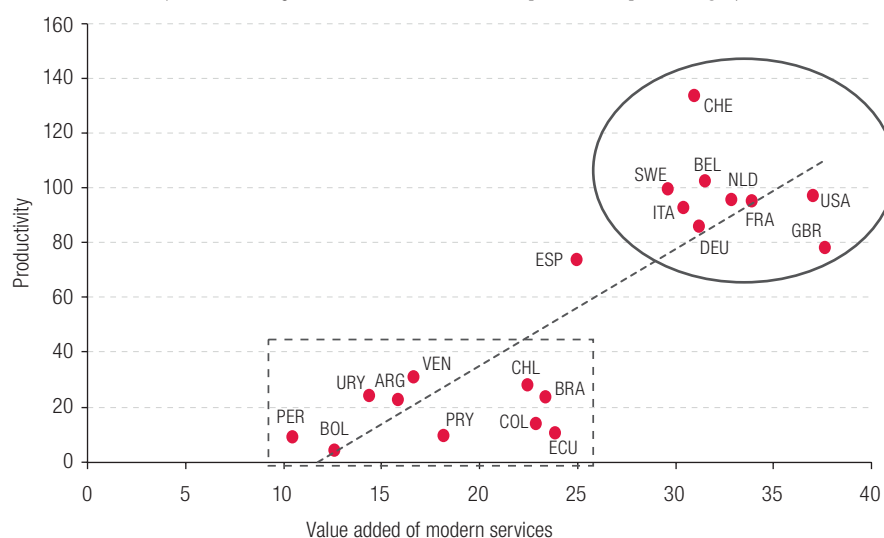
Between 1991 and 2020, on average, the countries with the largest share of modern services in total value added were those with the highest economic productivity. Figure 5 shows that the developed countries (circle) account for more than 23% of the total value added from the sophisticated services sector.

Figure 4
Regions of the world: average forward global value chain integration ratio, by sector, 1995–2018
(Percentages)



Source: Organisation for Economic Co-operation and Development (OECD), "Trade in value added" [online] <https://www.oecd.org/sti/ind/measuring-trade-in-value-added.htm>.

Figure 5
South America (10 countries) and developed countries (10 countries):^{a,b} relationship between economic productivity^c and value added of modern services, 1991–2020
(Thousands of dollars at constant 2010 prices and percentages)



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

^a The South American countries are Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay. The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.84.

^c Output per worker.

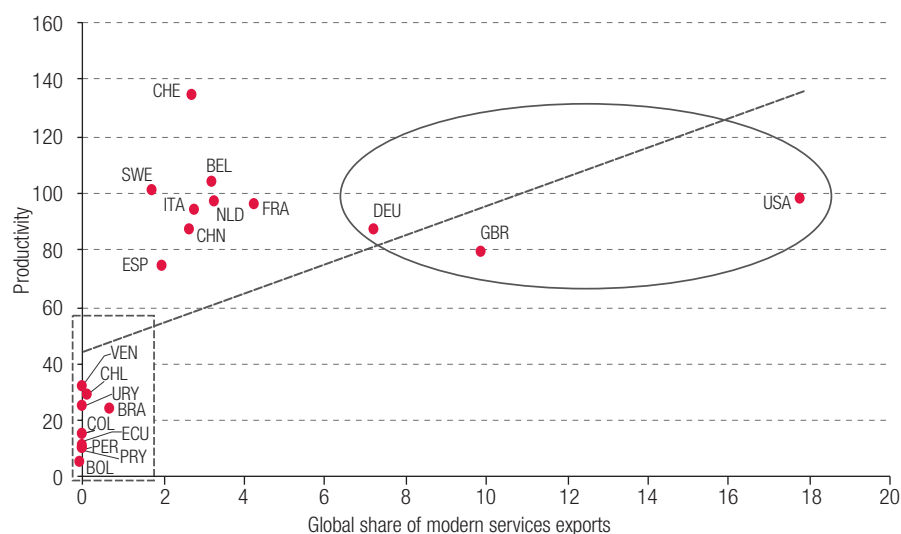
On the other hand, the South American countries (rectangle) are in the opposite situation.⁶ Despite some exceptions, such as Chile, Brazil, Colombia and Ecuador, whose share of the modern services sector in total value added is over 20%, Latin American countries have a reduced share of modern services in total value added compared to developed countries. As explained, the literature shows that economic productivity is closely related to modern services, which are inputs for the manufacturing sector and guarantee the competitiveness of developed countries.

Between 1991 and 2020 (see figure 6), it can be seen that the most competitive countries in service exports are those with the highest average productivity. Except for countries such as Switzerland and Belgium, whose productivity is high but which account for a low share of global trade in services, the leaders in global competitiveness in this sector are countries such as the United States, the United Kingdom and Germany.

More productive countries have a more homogeneous productive structure, meaning that technical progress is disseminated to all sectors of the economy. The largest European economies and the United States are the most dynamic in the service sector, while the peripheral economies are in the opposite position. The South American economies have the common characteristic of low productivity and a reduced share of services in foreign trade.

Thus, the position of the countries of South America in figures 5 and 6, in contrast with the largest European economies and the United States, suggests the existence of a dichotomy along the lines of the centre-periphery relationship. A similar phenomenon is observed in relation to the countries of Central America and the Caribbean (see figure A1.2).

Figure 6
South America (10 countries) and developed countries (10 countries):^{a b} relationship between economic productivity^c and global share of modern services exports, 1991–2020
(Thousands of dollars at constant 2010 prices and percentages)



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

^a The South American countries are Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay. The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.58.

^c Output per worker.

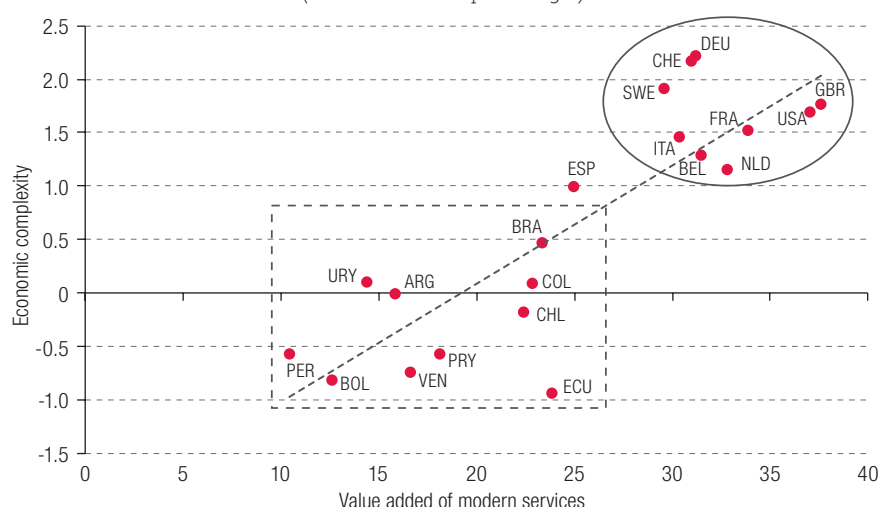
⁶ Central American and Caribbean countries have low productivity. However, in some countries, the share of modern services in value added is equivalent to that of developed countries. One reason is the large presence of offshore companies and their relationship with the financial sector in Caribbean countries. See figure A1.1.

As service exports demand qualified human capital (figure 7) and advanced technological structure, the modern services sector is also associated with economic complexity. Research and development (R&D) activity brings together professionals from different scientific areas and is responsible for innovation in several industrial sectors. More complex economies have more technologically advanced industrial sectors and use modern services during their production processes (Acemoglu and others, 2007). This is not the case in peripheral economies.

Figure 7 suggests a positive correlation between the complexity of the central countries and higher participation of the modern services sector in the composition of total value added. On the other hand, peripheral countries are not very complex and have a low share of services in total value added (see the data on Central America and the Caribbean in figure A1.3). The productive heterogeneity and technological dependence proposed by the original structuralism contribute to explaining this new configuration. Sector discontinuities and the passive absorption of external technical progress weaken the symbiosis between industry and modern services in the periphery.

The economic share of the modern services sector in Latin American countries is lower compared to central countries. It is important to highlight that there does not seem to be a significant relationship between modern services and complexity in peripheral countries.⁷ This reinforces the relative position of Latin America as a producer of primary goods and manufactured products with low technological content.

Figure 7
South America (10 countries) and developed countries (10 countries):^{a,b} relationship between economic complexity and value added of modern services, 1991–2020
(Index values and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), United Nations Statistical Division and Harvard University, Atlas of Economic Complexity [online database] <https://atlas.cid.harvard.edu/>.

^a The South American countries are Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay. The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States.

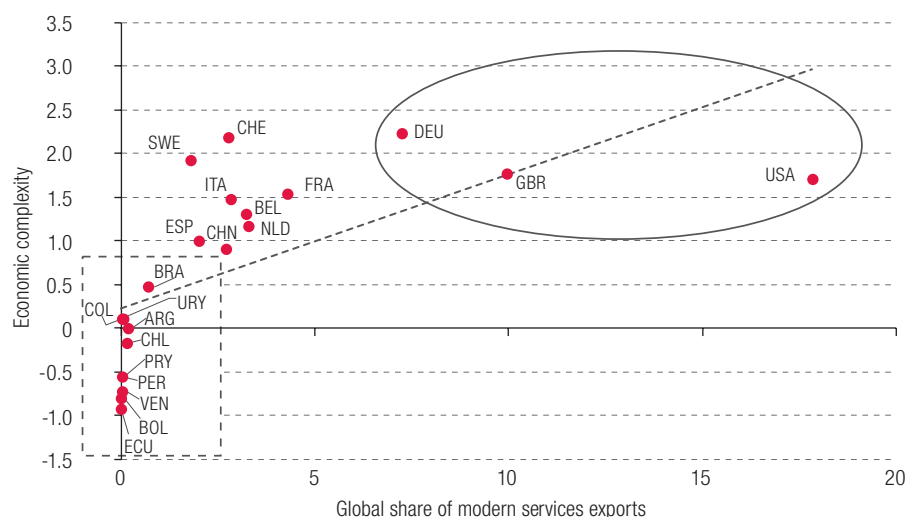
^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.85.

The low complexity of the South American countries is reflected in weak competitiveness on the international market (see figure 8). The largest European economies and the United States lead technological progress, are more complex, and therefore lead the generation of service innovations. On the other hand, the countries of South America (and Central America, see figure A1.4) are less economically complex and less competitive internationally.

⁷ For Caribbean countries and Mexico, only Mexico has the complete data series. Figure A1.3 lists the value added of services and economic complexity.

Figure 8

South America (10 countries) and developed countries (10 countries):^{a,b} relationship between economic complexity and global share of modern services exports, 1991–2020
(Index values and percentages)



Source: Harvard University, Atlas of Economic Complexity [online database] <https://atlas.cid.harvard.edu/>; United Nations Conference on Trade and Development (UNCTAD), UNCTADSTAT [online database] <https://unctadstat.unctad.org/EN/>.

^a The South American countries are Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay. The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.64.

Analysing the performance of services in terms of complexity shows that the centre-periphery dichotomy is present. Ernst (2005), Ernst and Kim (2001) and Sarti and Hiratuka (2011) argue that central countries expand the stock of productive knowledge and disseminate it both in industry and in other service activities.

These dynamics enable central countries to gain ground in foreign trade and gain access to markets in less developed countries. Central countries dominate the export of manufactured goods of high technological intensity, while the situation of peripheral countries is the opposite. Figure 9 suggests the existence of a weak but positive correlation between the share of modern services in total value added and the prevalence of high-tech products in exports.

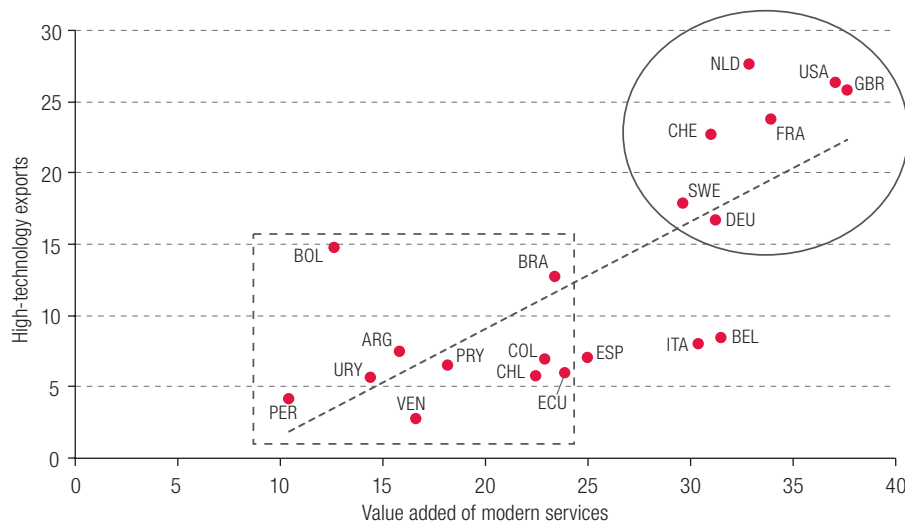
To a certain extent, this shows the degree of development of the national innovation system, and the symbiosis between services and the industrial sectors with the highest technological content, as proposed by Acemoglu and others (2007), UNCTAD (2013) and UNESCO (2015).

From the point of view of the centre-periphery relationship, Latin American countries (see figure A1.5) remain in a relatively unfavourable position. The modern services sector contributes little to generating value added, and the export basket is composed of low-technology items. As is the case in the industrial sector, the greatest exporters of services are the countries that are leaders in innovation (figures 10 and A1.6).

In addition to having a small share of modern services in the generation of their national income, peripheral countries lack the necessary requirements to engineer a process of knowledge and technology production (figures 11 and A1.7). As pointed out by Fajnzylber (1983), peripheral countries lack endogenization of technological dynamism. Where this process was absent in the industrialization phase, it becomes impossible to transfer a stock of knowledge to the modern services sector in the phase of productive reconfiguration, a situation that generates technological dependence in the service sector as well.

Figure 9

South America (10 countries) and developed countries (10 countries):^{a,b} relationship between high-technology exports as a share of manufactured exports and value added of modern services, 1996–2020 (Percentages)



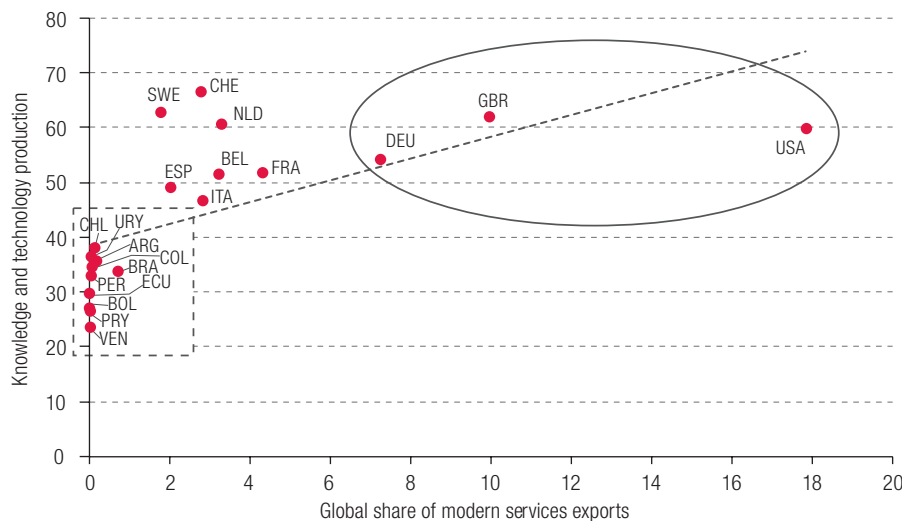
Source: Economic Commission for Latin America and the Caribbean (ECLAC), United Nations Statistical Division and World Bank, World Bank Open Data [online] <https://data.worldbank.org/>.

^a The South American countries are Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay. The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.75.

Figure 10

South America (10 countries) and developed countries (10 countries):^{a,b} relationship between knowledge and technology production and global share of modern services exports, 2013–2020 (Index values and percentages)

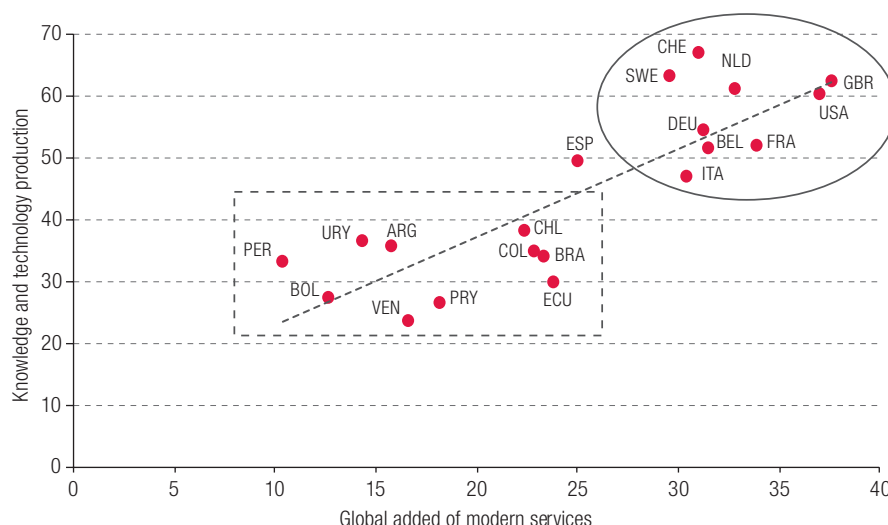


Source: World Intellectual Property Organization (WIPO), Global Innovation Index [online] <https://www.globalinnovationindex.org/Home>; United Nations Conference on Trade and Development (UNCTAD), UNCTADSTAT [online database] <https://unctadstat.unctad.org/EN/>.

^a The South American countries are Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay. The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.62.

Figure 11
South America (10 countries) and developed countries (10 countries):^{a,b} relationship between knowledge and technology production and value added of modern services, 2013–2020
(Index values and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), United Nations Statistical Division and World Intellectual Property Organization (WIPO), Global Innovation Index [online] <https://www.globalinnovationindex.org/Home>.

^a The South American countries are Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay. The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.85.

This weakens inter and intra-sectoral spillovers and contributes to modern Latin American services being uncompetitive. The symbiosis between industry and services becomes just the extension of a dependent relationship that reinforces the centre-periphery relationship and adversely affects long-term growth.

However, countries that share commercial service networks find better conditions to overcome underdevelopment, as appears to be happening with some Asian countries. Table 2 shows the largest service exporters and importers globally between 2000 and 2020. These countries account for more than 52% of foreign trade. It should be noted that no Latin American countries rank among the top ten services exporters and importers in recent decades.

The countries in the region are outside the circuit of foreign trade in services, demonstrating the existence of a gap between the most economically dynamic countries and the periphery. In addition to reinforcing the tendency towards low participation of Latin American countries in global value chains, as shown by ECLAC (2018), the results suggest the extension of the centre-periphery relationship to the modern services sector. The centre is comprised of countries whose service sector is internationally competitive and which disseminate innovations, while the periphery is characterized by an uncompetitive service sector and is separated from foreign trade.

Missio and Jayme (2012) argued that since ECLAC identified that a macroeconomic imbalance, the obsolescence of industrial plants and the technology divide were responsible for economic backwardness, the systemic competitiveness model proposed by neostructuralists is what drives economic growth. However, Latin American countries have not been successful in overcoming these deficiencies. Fiscal imbalance, deindustrialization and the technological gap remain characteristics of Latin America.

Integration with international markets as a strategy for accessing foreign investment and technological modernization has not changed the region's passivity in the endogenization of technical

progress. With deindustrialization, the knowledge stock that is generated in industry in developed countries is shared with the modern services that emerge, so that the dynamics of technical progress occur inter- and intra-sectorally.

Table 2
Selected countries: largest exporters and importers of services, 2000, 2010 and 2020
(Percentages)

	Country	Service exports: share of world total	Country	Service imports: share of world total
2000	United States	19.00	United States	14.45
	United Kingdom	7.89	Germany	9.09
	Germany	5.46	Japan	7.58
	France	5.30	United Kingdom	6.54
	Japan	4.55	France	4.00
	Italy	3.71	Italy	3.65
	Spain	3.45	Netherlands	3.51
	Netherlands	3.44	Canada	2.90
	Belgium	3.27	Belgium	2.75
	Canada	2.64	China	2.37
	Total	60.79	Total	56.84
2010	United States	14.63	United States	11.25
	United Kingdom	7.33	Germany	6.80
	Germany	5.66	China	4.99
	France	5.09	United Kingdom	4.81
	China	4.48	France	4.69
	Netherlands	4.06	Japan	4.25
	Japan	3.38	Netherlands	3.51
	India	2.94	India	2.96
	Spain	2.88	Italy	2.93
	Italy	2.55	Ireland	2.84
	Total	53.01	Total	49.03
2020	United States	14.03	United States	9.51
	United Kingdom	7.45	China	7.77
	Germany	6.00	Ireland	7.12
	China	5.42	Germany	6.34
	Ireland	5.38	France	4.81
	France	4.92	Netherlands	4.34
	Netherlands	4.33	United Kingdom	4.32
	Singapore	4.05	Singapore	4.15
	India	3.92	Japan	4.01
	Japan	3.13	India	3.13
	Total	58.62	Total	55.49

Source: United Nations Conference on Trade and Development (UNCTAD), UNCTADSTAT [online database] <https://unctadstat.unctad.org/EN/>.

This accelerates the generation of technical progress and widens the gap between developed and underdeveloped countries. As peripheral countries historically only replicate the centre's production techniques, Latin American industry does not have a stock of knowledge to share with services, which have emerged from deindustrialization. Therefore, modern Latin American services are not very competitive, and they tend to replicate the knowledge that is generated internationally. Structural change also reinforces the centre-periphery relationship in the service sector.

Although neo-structuralism recognizes the existence of an ongoing technological revolution, evaluations of economic backwardness and future development possibilities do not adequately consider the role of deindustrialization in structural change and the advancement of the service sector.

Therefore, it is argued that the effort to understand the determinants of technological progress, which now involves new dimensions and new forms of connection with production, has not been successful. In this context, it is possible to affirm that Latin America is in a peripheral position in this new stage of global structural change.

V. Conclusions

This paper discusses the importance of the modern services sector for Latin America, updating the central thesis of the Latin American structuralist approach to the centre-periphery dichotomy. We argue that deindustrialization contributes to the rise of services, a process which is endowed with a distinct character among countries.

Between 1991 and 2021, the data showed a spike in modern services as a share of employment in Asia and little growth in that regard in Latin American countries. Employment and productivity results support the thesis of Pagés (2010), McMillan and Rodrik (2011), and Ferreira and Da Silva (2015) that structural change in Latin America is contributing to a reduction in aggregate productivity.

Global value chain analysis showed that Southern and Eastern Asia have specialized more in the downstream segments (backward links), with above average levels of foreign input supply compared the rest of the world, while for Latin America, the degree of participation was low. Regarding forward sector participation rates, South American nations stand out for having relatively strong links in sectors based on natural resources, food and transportation equipment, as explained by ECLAC (2018). North American Free Trade Agreement (NAFTA) countries, especially the United States, lead the spread of progress in technical services.

The relationship between share of modern services in world exports and economic productivity suggests that the most productive countries lead the trade in modern services (Álvarez, Fernández-Stark and Mulder, 2020). The most complex countries are also the largest exporters in this sector. This confirms the thesis that knowledge-intensive business services are inputs for the industry and that they contribute to innovation.

These results are in line with the evidence that a connection between high-tech manufacturing and modern services is a characteristic of developed countries, corroborating studies by Miles (2008), Muller and Zenker (2001), Miozzo and Soete (2001), Leshner and Nordås (2006), Acemoglu and others (2007), Castellacci (2008), Savona and Steinmueller (2013) and Arbache (2015 and 2016).

Latin American countries are not complex, they are not very productive, and they are not leaders in technological progress in modern services. Central countries have competitive services, while peripheral countries occupy restricted space in foreign trade. One explanation for this dichotomy is that no “endogenous nucleus of technological dynamism” was developed during the industrialization phase of Latin American countries, as argued by Fajnzylber (1983).

As there was no endogenization of technical progress in the industrialization phase of Latin America, now, in the time of deindustrialization, there is no stock of technical knowledge that can spill over from industry to the service sector. The emergent modern services sector in Latin America needs all the conditions that exist in developed countries, and it has a tendency to perpetuate the pattern of replication of techniques and procedures once used by the industrial sector.

Therefore, the structuralist approach as it relates to a division between central and peripheral countries has contemporary relevance when transposed to an analysis that also involves the service sector, and it can contribute to explaining the longstanding underdevelopment of Latin American countries. Peripherality is also perpetuated in the service economy, and with it come new limitations on the economic growth of Latin American countries in a context of accelerated productive transformation.

Bibliography

- Aboal, D. and E. Tacsir (2015), "Innovation and productivity in services and manufacturing: the role of ICT investment", *IDB Working Paper Series*, No. 658, Washington, D.C., Inter-American Development Bank (IDB).
- Acemoglu, D. and others (2007), "Technology, information, and the decentralization of the firm", *The Quarterly Journal of Economics*, vol. 122, No. 4, Oxford, Oxford University Press.
- Albuquerque, E. (2007), "Inadequacy of technology and innovation systems at the periphery", *Cambridge Journal of Economics*, vol. 31, No. 5, Oxford, Oxford University Press.
- Álvarez, M., K. Fernández-Stark and N. Mulder (2020), "Gobernanza y desempeño exportador de los servicios modernos en América Latina y la India", *Project Documents*, (LC/TS.2019/112-P), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC).
- Arbache, J. (2016), "The contribution of services to manufacturing competitiveness in Brazil", *Innovation and Internationalization of Latin American Services* (LC/L.4177), R. Hernández and others (eds.), Santiago, El Colegio de la Frontera Norte/Economic Commission for Latin America and the Caribbean (ECLAC).
- (2015), "Produtividade no setor de serviços", *Produtividade no Brasil: desempenho e determinantes*, vol. 2, F. De Negri and L. Cavalcante (coords.), Brasília, Institute of Applied Economic Research (IPEA).
- Baumol, W. (1967), "Macroeconomics of unbalanced growth: the anatomy of urban crisis", *American Economic Review*, vol. 57, No. 3, Nashville, American Economic Association (AEA).
- Bértola, L. and J. Ocampo (2012), *The Economic Development of Latin America Since Independence*, Oxford, Oxford University Press.
- Bielschowsky, R. (2010), *Sesenta años de la CEPAL: textos seleccionados del decenio 1998-2008*, Santiago, Economic Commission for Latin America and the Caribbean (ECLAC).
- (1998), "Fifty years of ECLAC thought: a review", *ECLAC Thinking, Selected Texts (1948-1998)* (LC/G.2699), Santiago, Fondo de Cultura Económica/Economic Commission for Latin America and the Caribbean (ECLAC).
- Busso, M., L. Madrigal and C. Pagés (2013), "Productivity and resource misallocation in Latin America", *The B.E. Journal of Macroeconomics*, vol. 13, No. 1, Berlin, De Gruyter.
- Cadestin, C. and S. Miroudot (2020), "Services exported together with goods", *OECD Trade Policy Papers*, No. 236, Paris, Organisation for Economic Co-operation and Development (OECD).
- Castellacci, F. (2008), "Technological paradigms, regimes and trajectories: manufacturing and service industries in a new taxonomy of sectoral patterns of innovation", *Research Policy*, vol. 37, No. 6-7, Amsterdam, Elsevier.
- Cimoli, M. and G. Porcile (2013), "Tecnología, heterogeneidad y crecimiento: una caja de herramientas estructuralistas", *Productive Development series*, No. 194 (LC/L.3736), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC).
- Cruz, M. and others (2007), "Uma análise do impacto da composição ocupacional sobre o crescimento da economia brasileira", *Economia*, vol. 8, No. 4, Brasília, Brazilian Association of Graduate Programs in Economics (ANPEC).
- Dahlman, C. and O. Sananikone (1997), "Taiwan, China: policies and institutions for rapid growth", *Lessons from East Asia*, D. Leipziger (ed.), Ann Arbor, University of Michigan Press.
- ECLAC (Economic Commission for Latin America and the Caribbean) (2018), *International trade Outlook for Latin America and the Caribbean, 2017* (LC/PUB.2017/22-P), Santiago.
- (1998), *The Fiscal Covenant: Strengths, Weaknesses, Challenges. Summary* (LC/G.2024), Santiago.
- (1990), *Changing production patterns with social equity: the prime task of Latin American and Caribbean development in the 1990s*, ECLAC Books, No. 25 (LC/G.1601-P), Santiago.
- Ernst, D. (2005), "The new mobility of knowledge: digital information systems and global flagship networks", *Digital Formations: IT and New Architectures in the Global Realm*, R. Latham and S. Sassen (eds.), Princeton, Princeton University Press.
- Ernst, D. and L. Kim (2001), "Global production networks, knowledge diffusion and local capability formation: a conceptual framework", *East-West Center Working Paper*, No. 19, Honolulu, East-West Center.
- Fajnzylber, F. (1990), "Industrialization in Latin America: from the 'black box' to the 'empty box': a comparison of contemporary industrialization patterns", *Cuadernos de la CEPAL*, No. 60 (LC/G.1534/Rev.1-P), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC).
- (1983), *La industrialización trunca de América Latina*, Mexico City, Nueva Imagen.
- Ferreira, P. and L. da Silva (2015), "Structural transformation and productivity in Latin America", *The B.E. Journal of Macroeconomics*, vol. 15, No. 2, Berlin, De Gruyter.

- Ffrench-Davis, R. (1988), "An outline of a neo-structuralist approach", *CEPAL Review*, No. 34 (LC/G.1521-P), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC).
- Ffrench-Davis, R. and M. Torres (2021), "Neo-structuralism", *The New Palgrave Dictionary of Economics*, M. Vernengo, E. Pérez-Caldentey and R. Barkley (eds.), London, Palgrave Macmillan.
- Furtado, C. (1969), "Desarrollo y estancamiento en América latina: un enfoque estructuralista", *Investigación económica*, vol. 29, No. 113, Mexico City, National Autonomous University of Mexico (UNAM).
- _____(1961), *Desenvolvimento e subdesenvolvimento*, Rio de Janeiro, Editora Fundo de Cultura.
- Georgakopoulos, D. and others (2016), "Internet of Things and edge cloud computing roadmap for manufacturing", *IEEE Cloud Computing*, vol. 3, No. 4, Piscataway, Institute of Electrical and Electronics Engineers (IEEE).
- Giovanini, A. and M. Arend (2017), "Contribution of services to economic growth: Kaldor's fifth law?", *RAM: Revista de Administração Mackenzie*, vol. 18, No. 4, São Paulo, Editora Mackenzie.
- Giovanini, A., W. Pereira and K. Saath (2020), "Intermediate services' impact on capital goods production", *Nova Economia*, vol. 30, No. 1, Pampulha, Federal University of Minas Gerais.
- Gwynne, R. and C. Kay (2000), "Views from the periphery: futures of neoliberalism in Latin America", *Third World Quarterly*, vol. 21, No. 1, Hoboken, Taylor & Francis.
- Kaldor, N. (1966), *Causes of the Slow Rate of Economic Growth of the United Kingdom: An Inaugural Lecture*, Cambridge, Cambridge University Press.
- Kim, K. and D. Leipziger (1997), *The Lessons of East Asia. Korea: A Case of Government-led Development*, Washington, D.C., World Bank.
- Kon, A. (2006), "O comércio internacional da indústria de serviços: os impactos no desenvolvimento de países da América", *Cadernos PROLAM/USP*, vol. 5, No. 9, São Paulo, University of São Paulo.
- Kowalski, P. and others (2015), "Participation of developing countries in global value chains: implications for trade and trade-related policies", *OECD Trade Policy Papers*, No. 179, Paris, Organisation for Economic Co-operation and Development (OECD).
- Leshner, M. and H. Nordås (2006), "Business services, trade and costs", *OECD Trade Policy Papers*, No. 46, Paris, Organisation for Economic Co-operation and Development (OECD).
- Lodefalk, M. (2014), "The role of services for manufacturing firm exports", *Review of World Economics*, vol. 150, No. 1, Berlin, Springer.
- McMillan, M. and D. Rodrik (2011), "Globalization, structural change and productivity growth", *Making Globalization Socially Sustainable*, M. Bachetta and M. Jansen (eds.), Geneva, International Labour Organization (ILO).
- Miles, I. (2008), "Patterns of innovation in service industries", *IBM Systems Journal*, vol. 47, No. 1, Armonk, International Business Machines Corporation (IBM).
- _____(2005), "Knowledge intensive business services: prospects and policies", *Foresight*, vol. 7, No. 6, Bingley, Emerald Publishing.
- Miozzo, M. and L. Soete (2001), "Internationalization of services: a technological perspective", *Technological Forecasting and Social Change*, vol. 67, No. 2-3, Amsterdam, Elsevier.
- Missio, F. and F. Jayme (2012), "Estruturalismo e neoestruturalismo: velhas questões, novos desafios", *Análise Econômica*, vol. 30, No. 57, Porto Alegre, Federal University of Rio Grande do Sul.
- Missio, F., F. Jayme and J. Oreiro (2015), "The structuralist tradition in economics: methodological e macroeconomics aspects", *Brazilian Journal of Political Economy*, vol. 35, No. 2, São Paulo, Center for Political Economy.
- Muller, E. and A. Zenker (2001), "Business services as actors of knowledge transformation: the role of KIBS in regional and national innovation systems", *Research Policy*, vol. 30, No. 9, Amsterdam, Elsevier.
- Niggemann, O. and J. Beyerer (eds.) (2016), *Machine Learning for Cyber Physical Systems: Selected Papers from the International Conference ML4CPS 2015*, Berlin, Springer.
- Nordås, H. and Y. Kim (2013), "The role of services for competitiveness in manufacturing", *OECD Trade Policy Papers*, No. 148, Paris, Organisation for Economic Co-operation and Development (OECD).
- Ocampo, J. (2008), "El auge económico latinoamericano", *Revista de Ciencia Política*, vol. 28, No. 1, Santiago, Pontifical Catholic University of Chile (PUC).
- OECD (Organisation for Economic Co-operation and Development) (2013), *Interconnected Economies: Benefiting from Global Value Chains*, Paris.
- Oreiro, J. and C. Feijó (2010), "Desindustrialização: conceituação, causas, efeitos e o caso brasileiro". *Brazilian Journal of Political Economy*, vol. 30, No. 2, São Paulo, Center for Political Economy.

- Oulton, N. (2001), "Must the growth rate decline? Baumol's unbalanced growth revisited", *Oxford Economic Papers*, vol. 53, No. 4, Oxford, Oxford University Press.
- Pagés, C. (2010), "Productivity in Latin America: the challenge of the service sector", *The Age of Productivity*, New York, Palgrave Macmillan.
- Palma, J. (2019), "Desindustrialización, desindustrialización 'prematura' y 'síndrome holandés'", *El Trimestre Económico*, vol. 86, No. 344, Mexico City, Fondo de Cultura Económica.
- (2008), "De-industrialization', 'premature' de-industrialization and the Dutch Disease", *The New Palgrave Dictionary of Economics*, S. Durlauf and L. Blume (eds.), New York, Palgrave Macmillan.
- (2005), "Quatro fontes de 'desindustrialização' e um novo conceito de 'doença holandesa'", paper presented at the Conference on Industrialization, Deindustrialization and Development, São Paulo, Federation of Industries of the State of São Paulo/Institute of Education and Innovation (FIESP/IEDI), 28 August.
- Pilat, D. and A. Wölfl (2004), "ICT production e ICT use: what role in aggregate productivity growth?", *The Economic Impact of ICT: Measurement, Evidence, and Implications*, Paris, Organisation for Economic Co-operation and Development (OECD).
- Pinto, A. (1970), "Naturaleza e implicaciones de la 'heterogeneidad estructural' de la América Latina", *El Trimestre Económico*, vol. 37, No. 1, Mexico City, Fondo de Cultura Económica.
- (1965), "Concentración del progreso técnico y de sus frutos en el desarrollo latinoamericano", *El Trimestre Económico*, vol. 32, No. 1, Mexico City, Fondo de Cultura Económica.
- Prebisch, R. and G. Cabañas (1949), "El desarrollo económico de la América Latina y algunos de sus principales problemas", *El Trimestre Económico*, vol. 16, No. 3, Mexico City, Fondo de Cultura Económica.
- Ramos, J. and O. Sunkel (1993), "Toward a neostructuralist synthesis", *Development from Within: Toward a Neostructuralist Approach for Latin America*, Boulder, Lynne Rienner Publishers.
- Rodríguez, O. (2009), *O estruturalismo latino-americano*, Rio de Janeiro, Civilização Brasileira.
- (2006), *El estructuralismo latinoamericano*, Mexico City, Siglo XXI/Economic Commission for Latin America and the Caribbean (ECLAC).
- Rodríguez, O. and others (1995), "CEPAL: velhas e novas idéias", *Economia e Sociedade*, vol. 4, No. 2, Campinas, State University of Campinas.
- Rodrik, D. (1994), "King Kong meets Godzilla: the World Bank and the East Asian miracle", *Miracle or Design: Lessons from the East Asian Experience*, C. Fishlow and others (eds.), Washington, D.C., Overseas Development Council.
- Rowthorn, R. and R. Ramaswamy (1999), "Growth, trade, e deindustrialization", *IMF Staff Papers*, vol. 46, No. 1, Washington, D.C., International Monetary Fund (IMF).
- Salama, P. (2012), "Globalización comercial: desindustrialización prematura en América Latina e industrialización en Asia", *Comercio Exterior*, vol. 62, No. 6, Mexico City, National Bank of Foreign Trade (Bancomext).
- Sarti, F. and C. Hiratuka (2011), *Desenvolvimento industrial no Brasil: oportunidades e desafios futuros*, Campinas, State University of Campinas.
- Savona, M. and W. Steinmueller (2013), "Service output, innovation and productivity: a time-based conceptual framework", *Structural Change and Economic Dynamics*, vol. 27, Amsterdam, Elsevier.
- Schuh, G. and others (2015), "Promoting work-based learning through industry 4.0", *Procedia CIRP*, vol. 32, Amsterdam, Elsevier.
- Smith, H. (2000), *Industry Policy in Taiwan and Korea in the 1980s: Winning with the Market*, Cheltenham, Edward Elgar Publishing.
- Tavares, M. (1972), "Auge e declínio do processo de substituição de importações no Brasil", *Da substituição de importações ao capitalismo financeiro*, Rio de Janeiro, Zahar.
- Thirlwall, A. (2002), *The Nature of Economic Growth: An Alternative Framework for Understanding the Performance of Nations*, Cheltenham, Edward Elgar Publishing.
- Titelman, D. and E. Pérez Caldentey (2015), "Macroeconomics for development in Latin America and the Caribbean: new thoughts on countercyclicality", *Neostructuralism and Heterodox Thinking in Latin America and the Caribbean in the Early Twenty-First Century*, ECLAC Books, No. 132 (LC/G.2633-P/Rev.1), A. Bárcena and A. Prado (eds.), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC).
- Torres, M. (2019), "Globalización, capitalismo transnacional y dependencia: el itinerario de una 'visión'", *Del estructuralismo al neoestructuralismo: la travesía intelectual de Osvaldo Sunkel* (LC/PUB.2019/9), A. Bárcena and M. Torres (eds.), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC).
- Torres, M. and J. Ahumada (2022), "Las relaciones centro-periferia en el siglo XXI", *El Trimestre Económico*, vol. 89, No. 353, Mexico City, Fondo de Cultura Económica.

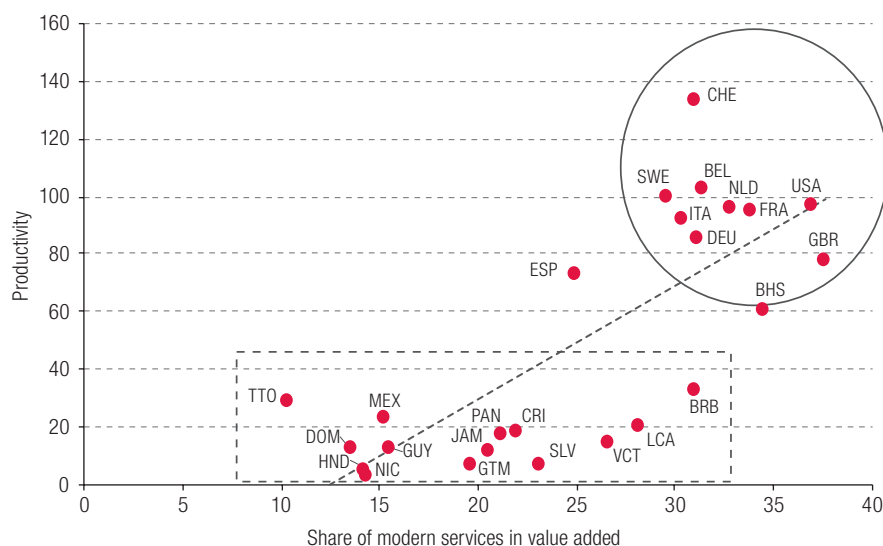
- Tregenna, F. (2008), "Characterising deindustrialisation: an analysis of changes in manufacturing employment and output internationally", *Cambridge Journal of Economics*, vol. 33, No. 3, Oxford, Oxford University Press.
- UNCTAD (United Nations Conference on Trade and Development) (2017), *World Investment Report 2017: Investment and the Digital Economy*, New York.
- (2013), *World Investment Report 2013. Global Value Chains: Investment and Trade for Development*, New York.
- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2015), UNESCO Institute for Statistics (UIS) [online] <http://www.uis.unesco.org>.

Annex A1

Figure A1.1

Latin America and the Caribbean (15 countries) and developed countries (10 countries):^{a,b}
relationship between economic productivity^c and share of modern services
in value added, 1991–2020

(Thousands of dollars at constant 2010 prices and percentages)



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

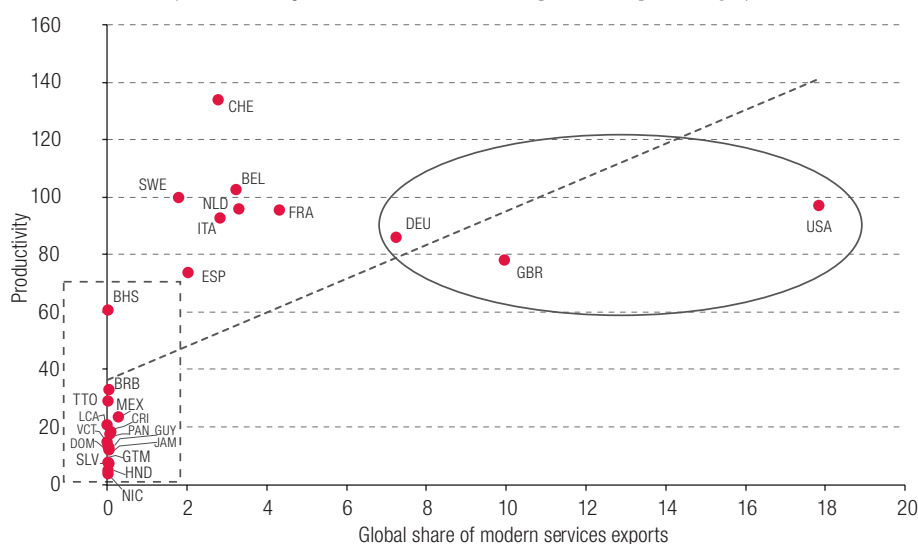
^a The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. The countries in Latin America and the Caribbean are the Bahamas, Barbados, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.76.

^c Output per worker.

Figure A1.2

Latin America and the Caribbean (15 countries) and developed countries (10 countries):^{a,b}
relationship between economic productivity^c and global share
of modern services exports, 1991–2020
(Thousands of dollars at constant 2010 prices and percentages)



Source: International Labour Organization (ILO), ILOSTAT [online database] <https://ilostat.ilo.org/>; United Nations Conference on Trade and Development (UNCTAD), UNCTADSTAT [online database] <https://unctadstat.unctad.org/EN/>.

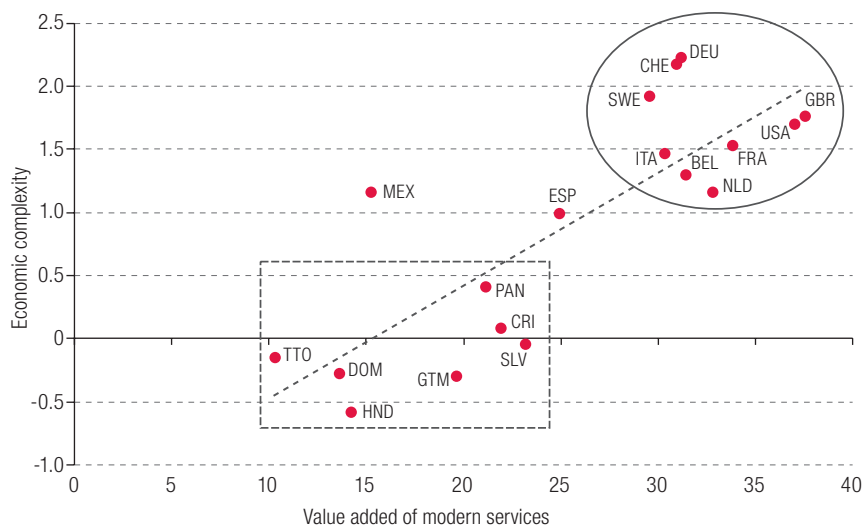
^a The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. The countries in Latin America and the Caribbean are the Bahamas, Barbados, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.57.

^c Output per worker.

Figure A1.3

Latin America and the Caribbean (15 countries) and developed countries (10 countries):^{a,b}
relationship between economic complexity and value added of modern services, 1991–2020
(Index values and percentages)



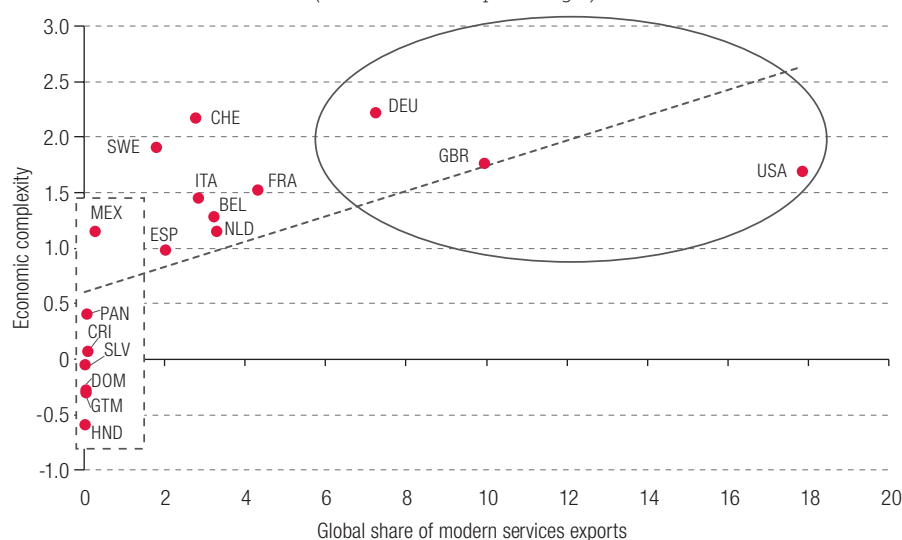
Source: Economic Commission for Latin America and the Caribbean (ECLAC), United Nations Statistical Division and Harvard University, Atlas of Economic Complexity [online database] <https://atlas.cid.harvard.edu/>.

^a The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. The countries in Latin America and the Caribbean are the Bahamas, Barbados, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.81.

Figure A1.4

Latin America and the Caribbean (15 countries) and developed countries (10 countries):^{a,b}
relationship between economic complexity and global share
of modern services exports, 1991–2020
(Index values and percentages)

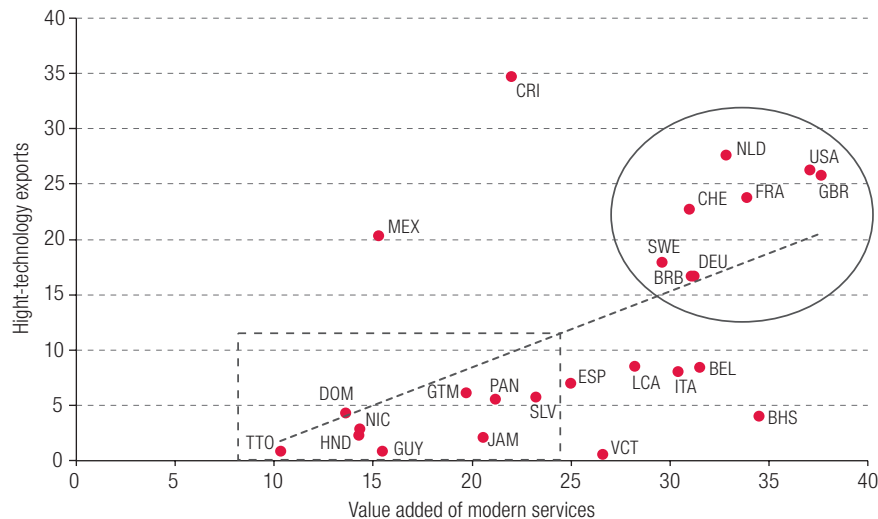


Source: Harvard University, Atlas of Economic Complexity [online database] <https://atlas.cid.harvard.edu/>; United Nations Conference on Trade and Development (UNCTAD), UNCTADSTAT [online database] <https://unctadstat.unctad.org/EN/>.

^a The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. The countries in Latin America and the Caribbean are the Bahamas, Barbados, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.58.

Figure A1.5
 Latin America and the Caribbean (15 countries) and developed countries (10 countries):^{a,b}
 relationship between high-technology exports as a share of manufactured exports
 and value added of modern services
 (Percentages)



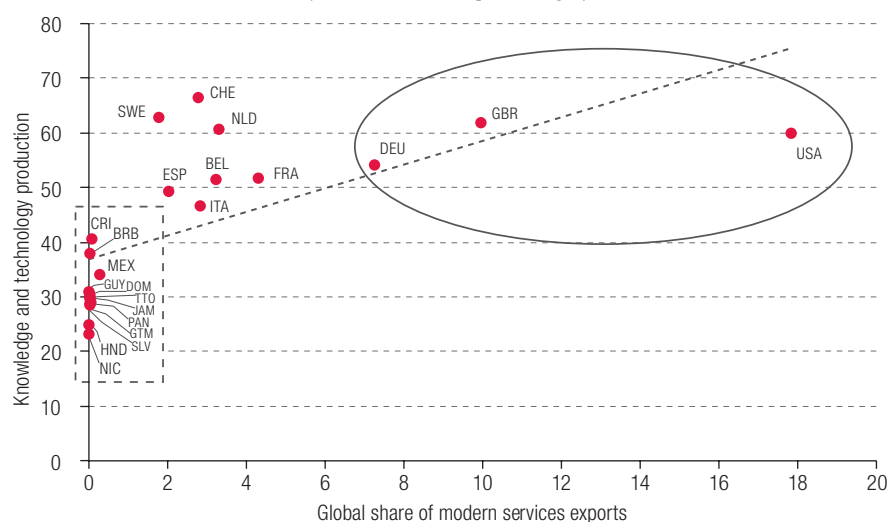
Source: World Bank, Economic Commission for Latin America and the Caribbean (ECLAC) and United Nations Statistical Division.

^a The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. The countries in Latin America and the Caribbean are the Bahamas, Barbados, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.55.

Figure A1.6

Latin America and the Caribbean (15 countries) and developed countries (10 countries):^{a,b}
relationship between knowledge and technology production and global share
of modern services exports, 2013–2020
(Index values and percentages)

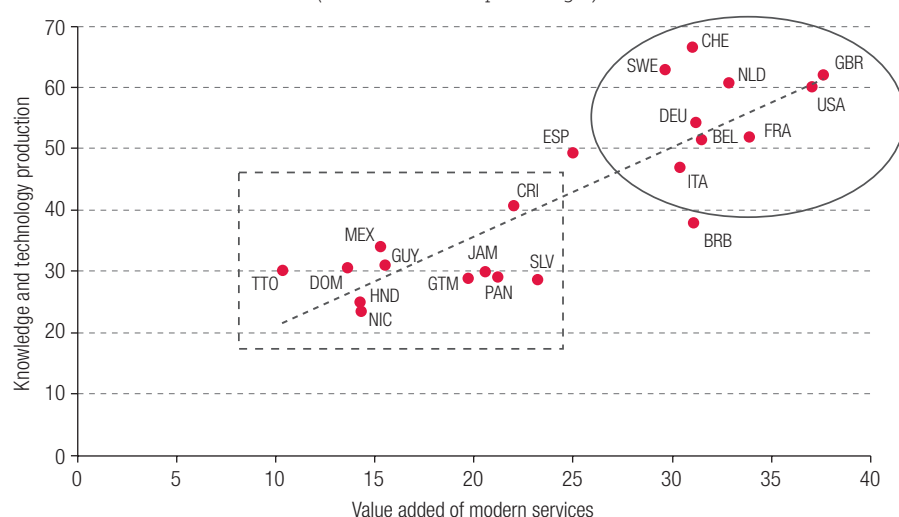


Source: World Intellectual Property Organization (WIPO), Global Innovation Index [online] <https://www.globalinnovationindex.org/Home>; United Nations Conference on Trade and Development (UNCTAD), UNCTADSTAT [online database] <https://unctadstat.unctad.org/EN/>.

^a The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. The countries in Latin America and the Caribbean are the Bahamas, Barbados, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.65.

Figure A1.7
 Latin America and the Caribbean (15 countries) and developed countries (10 countries):^{a,b}
 relationship between knowledge and technology production and value added
 of modern services, 2013–2020
 (Index values and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), United Nations Statistical Division and World Intellectual Property Organization (WIPO), Global Innovation Index [online] <https://www.globalinnovationindex.org/Home>.

^a The developed countries are Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. The countries in Latin America and the Caribbean are the Bahamas, Barbados, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.

^b Sample European countries comprise 80% of European GDP. Pearson correlation coefficient: 0.65.