Industrial policy matters: the co-evolution of economic structure, trade, and FDI in Brazil and Mexico, 2000 - 2015

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Industrial policy matters: the co-evolution of economic structure, trade, and FDI in Brazil and Mexico, 2000–2015

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Abstract

The early work by Kuznets and Chenery originally developed the theme that economic development was not simply a synonym for aggregate GDP growth, but entailed qualitative changes in the structures of production, employment, and consumption. Later work in international business and economics explored the co-evolution between FDI and economic structure. We investigate the co-evolution between FDI, economic structure and export structures in the two largest Latin American economies, Brazil and Mexico, over the period 2000–2015. Both initially followed similar development strategies during the import-substitution era. During the liberalization era they followed somewhat different strategies towards maintaining the competitiveness of domestic actors. In addition to the analysis of key indicators, we discuss the role played by industrial policies—or their absence—within Brazil's and Mexico's development strategies. Industrial policy instruments, such as infant industry protection, subsidies, tax and financial incentives, as well as performance requirements may be crucial to shift the economic structure in the direction of the desired industries. Tracing the co-evolution between FDI and economic structures, even in the absence of statistical rigour to support causal claims, provides interesting insights for industrial policy in the twenty-first century.

Keywords Economic development · Structural change · Export structure · Industrial policy · Brazil · Mexico

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1 Introduction

Since the 1970s, scholars and international organizations have been promoting foreign direct investment (FDI) as a catalyst for economic development. A key assumption is that FDI is a vehicle for knowledge and technology transfer. This is supposed to make the host country more productive, not only directly—that is, through the multinational enterprise (MNE) affiliate's activities—but also indirectly because it is assumed that FDI generate positive spillovers to domestic firms.

Both economics and International Business (IB) has sought to unravel the socio-economic impact of the MNEs (van der Straaten et al., 2023). Much of the work on IB and development has noted that the presence of MNE activity per se is not a *sine qua non* for economic development, and indeed, the net effect can be negative, and may evolve over time due to a variety of factors.

The 'investment development path' (IDP) has been critical in understanding the co-evolution of FDI and economic structures. Influenced by the stages of development literature that emphasised that economic development was not simply a synonym of GDP growth but entailed qualitative changes in the structures of production, employment, and consumption (Chenery, 1960; Kuznets, 1957), the IDP has described how a country's inward and outward FDI position evolved according to its level of development (Dunning, 1981, 1988; Dunning & Narula, 1996; Narula, 1996; Narula & Dunning, 2010).

The literature on IB and development explains that the development effects of a specific investment depended upon a number of factors. The extent to which MNE investments influenced the development of its host location was primarily determined by the characteristics of its affiliates operating in the country (in the form of the MNE's ownership advantages[1]) and the characteristics of the host country, as reflected in its location advantages. Both advantages are not immutable and tend to influence each other—that is, the presence of MNEs may contribute to alter the country's location advantages while the country's characteristics may affect the affiliates' advantages.

The impacts on the host economy also depend on the fundamental motives that led the MNE to engage in that specific investment. Cuervo-Cazurra et al. (2015) list four broad (and non-mutually exclusive) motives that leads a firm to invest abroad: sell more, buy better (reduce costs of inputs), upgrade (increase the pool of assets that compounds the firm's competitive advantages) or escape (from an adverse environment in the home country).[2]

The development effects of any given affiliate within an MNE's network of affiliates are not constant, and indeed change over time. The choice of the activities performed in a country is connected to an MNE's overall strategy. To some extent, affiliates of the same MNE located in different countries may well compete against each

[1] According to the theoretical approach associated with the eclectic paradigm, FDI requires the fulfilment of three preconditions: (a) an investing firm must own some kind of proprietary assets capable to yield extraordinary rents as a means to overcome the cost disadvantages of being an outsider (ownership advantage); (b) there must be an advantage in producing in chosen location, otherwise the firm would produce and export from home country (location advantage); (c) there must be a justification for carrying out the activity within the firm, otherwise a market transaction (such as the licensing of the firm's brand or technology to a third party) would be preferred (internalization advantage).

[2] These motives are similar, but not identical, to Dunning's (1993) better-known classification.

other for tasks and functions within the overall corporate structure. Thus, the role of any given affiliate evolves over time, and may become increasingly specialised and upgraded, or downgraded. Changes in scope, scale and intensity will reflect on its economic impact to the host economy. A subsidiary, a region or a country can remain locked-in to low value adding activities, and may have a negligible multiplier effect, reflecting weak backward and forward linkages by the MNE affiliate.

Although many studies have investigated the impact of FDI on host economies, fewer studies investigate the relationship between FDI and GDP growth [for a review, see Narula and Pineli (2017, 2019)]. There are fewer studies that examine the co-evolution between FDI and economic structure, with Pineli et al. (2021) and Pineli (2022) being two recent attempts to advance the literature on FDI and structural change, but in general such analyses require data that is not usually available.

We seek to bridge this gap by investigating the co-evolution between FDI, economic structure and export structures in the two largest Latin American economies, Brazil and Mexico, over the period 2000–2015. For much of the twentieth century, these countries followed quite similar development strategies, focusing on inward-oriented industrialization as a path to economic prosperity. At the end of the import-substitution era, and accelerated by huge foreign debts, Brazil and Mexico adjusted their strategies, but in differing ways. While Brazil remained largely oriented towards its domestic market, Mexico made a radical shift towards an export-led model. Despite these differences, both countries converged in (at least) one thing: the disappointing results in terms of GDP growth.

In addition to the analysis of the key indicators, we briefly discuss the role played by industrial policies—or their absence—within Brazil's and Mexico's development strategies. We take the view that industrial policy has the objective of changing the structure of an economy in either direction, magnitude, or speed, in a way that market forces alone would not be able to achieve. Our analysis implicitly assumes that what an economy produces and exports matters for its long-term growth trajectory (Hausmann et al., 2006). Industrial policy instruments, such as infant industry protection, subsidies, tax and financial incentives, as well as performance requirements may be crucial to shift the economic structure in the direction of the desired industries. Nonetheless, industrial policy may also be the source of distortions and inefficiencies that, in the end, hamper economic growth. Therefore, industrial policy incentives must be temporary, transparent, and evaluated on measurable performance criteria defined in advance (Moreno-Brid, 2016).

The paper is organized as follows: the next section presents the antecedents of the period under analysis, discussing the role and the effects of FDI during the import-substitution industrialization (ISI) phase and the following period of market-oriented reforms. The period 2000–2015 is analysed in the third section, which is followed by the concluding remarks.

2 A methodological note

As a general rule, identifying causal relations to illustrate socio-economic interactions and their consequences through statistically rigorous means is preferable to the simple detection of co-movements between variables. In the context of this study, that would require the evidence to allow us to assert definitively that one of the key causes of changes in the

output and export structures of Brazil and Mexico was FDI activity. Reaching such a conclusion with the necessary rigour is very difficult because of the characteristics (and even the availability) of data. Longitudinal firm-level data would certainly be the best choice, but such data are not currently available, nor indeed are longitudinal industry-level data. Furthermore, annual FDI flows are too volatile—a problem that is exacerbated at higher levels of disaggregation—making it hard to econometrically detect any relation between them and variables that are less volatile, such as output and exports. Thus, to reduce the undesirable impact of volatility, it is preferable to use period averages, but this implies waiving any causal claim, although, as we show, some associations between FDI and output and export variations are rather clear. Given these considerations, we embrace a less ambitious goal, tracing the co-evolution between FDI and economic structures, which, even without causal claims, provides very interesting insights for industrial policy and investment policy in the twenty-first century.

3 Antecedents: import-substitution industrialization and the market reforms of the 1980s and 1990s

From the 1950s to the 1970s (and even earlier), Brazil and Mexico (like much of Latin America) followed similar strategies in their pursuit of prosperity. In line with the diagnostics outlined by some of the region's most famous economists, such as Raúl Prebisch and Celso Furtado, the political leaders of both countries acknowledged that specialization in primary goods for export was a development trap not only because it made their economies dependent on volatile external markets, but also because it hindered progress, as the development of capabilities was regarded as highly dependent on the patterns of specialization (Porcile, 2021; Prebisch, 1949). Industrialization was considered crucial to escape such a development trap. However, it was also clear that firms from these countries would not be able to compete with the extant dominant manufacturing exporters. Thus, domestic manufacturers targeted the domestic market, which was protected from foreign competitors (Prebisch, 1949; Singer, 1950). The belief was that the exposure to novelty in the form of new products, new processes, new technologies and new knowledge would induce learning and the development of upgraded domestic capabilities (Bruton, 1989).

Although both countries had manufacturing industries in place since the nineteenth Century, it was not until World War II (WWII) that the manufacturing sector reached its glory days in Brazil[3] and Mexico. From WWII until the foreign debt

[3] ISI accelerated in Brazil during Getulio Vargas administration (1930–1945). However, only in the 1950s, when the Targets Plan (*Plano de Metas*) was adopted by president Juscelino Kubitschek, it unequivocally ascended to the central role in the government's development agenda (Suzigan & Furtado, 2006). Indeed, ISI before 1945 was largely a consequence of external events, such as the two world wars and the great depression instead of the result of conscious planning (Fishlow, 1972). Some authors (for example, Hirschman, 1968) refer to the initial phase as the "easy phase" because it involves the substitution of non-durable consumer goods and some simple durable consumer goods. The next phase, in turn, requires a much larger mobilization of resources, as it involves the most capital-intensive intermediate and capital goods industries, besides more sophisticated durable goods industries (such as electronics and automotive). This is usually referred to as "heavy industrialization".

crises of the early 1980s, state-led import substitution industrialization (ISI) was the engine of Brazilian and Mexican growth. Key industries, such as petroleum, electricity and telecommunications were kept under strict State control. FDI was allowed and welcomed—with a dose of suspicion—in non-strategic manufacturing and services industries, although occasionally subject to minority stakes and performance requirements. In Brazil, foreign MNEs became the market leaders in industries like automobiles, pharmaceuticals and electrical equipment (Bonelli, 1980; Morley & Smith, 1971; Nonnenberg, 2003; Willmore, 1987). In Mexico, foreign MNEs dominated industries like automobiles, chemicals and electrical equipment (Newfarmer & Mueller, 1975), but Mexican laws were considerably less permissive than Brazilian laws as they imposed restrictions on wholly-owned MNE subsidiaries, with a preference for joint ventures with national private capital or even with state-owned enterprises (Vidal, 1986).[4] In Mexico, further stimulus for inward FDI was given in the mid-1960s by the introduction of a program aimed at creating export processing industries in states that bordered the US, and were suffering from high unemployment rates, giving rise to the *maquiladora*—or simply *maquila*—system.[5] Similarly, in Brazil inward FDI was encouraged by the implementation of the 2nd National Development Plan (*II Plano Nacional de Desenvolvimento*—II PND) (1975–1979). The first oil shock saw a balance of payments constriction imposed in Brazil, aimed at deepening import substitution of basic materials (steel, cement, cellulose, fertilizers, petrochemicals) and capital goods, among other ambitious targets[6] (Suzigan, 1988).

The results of the ISI are controversial—evaluations were initially favourable but became increasingly negative as the distortions and inefficiencies became clear, although under a heavily protectionist regime, manufacturing shares in GDP rose substantially in both countries.[7] Both economies were able to diversify away from primary products. However, several of the new industries were "artificial",

[4] A decree issued in 1944 limited foreign investment to a minority position (up to 49%), what meant the need of a domestic partner. However, the decree was loosely enforced until the turn of the 1960s. Then, nationalist pressures led to the Mexicanization—that is, the transfer of the controlling stake to domestic investors (Creel Jr., 1968)—of some industries, such as petrochemicals. In addition, the government became more selective, giving priority to import substituting industrial plants (Newfarmer & Mueller, 1975). The Foreign Investment Law introduced in 1973 kept unchanged the 49% cap on foreign investors' participation but gave to the Foreign Investment Commission the power of relaxing such restriction when a particular foreign investment was deemed critical for the country's development. Koslow (1992) argues that, with such flexibility, the attitude of Mexican officials towards FDI swung according to economic and political conditions. Nonetheless, the Law's dispositions created so many bureaucratic obstacles for the majority stakeholder that most FDI were directed to the formation of joint ventures with local entrepreneurs (Maviglia, 1986).

[5] The *maquila* system is further detailed in the next section.

[6] One of the II PND's central objectives was rebalancing the tripod formed by the state-owned, the foreign multinational and the private national enterprise, strengthening the latter's position in the country's economy (Lessa, 1978). Thus, the FDI policy became more selective, prioritizing, for example, industries capable of contributing to diversify the country's export structure (Nonnenberg, 2003).

[7] In Brazil, aside from macroeconomic tools such as multiple exchange rates, the protectionist arsenal included high tariffs, restrictive import licences and prohibition of imports when a similar domestically made good was available (Colistete, 2003).

and unable to either compete with imports or to compete in export markets. The involvement of MNEs also engendered mixed feelings: on the one hand, the close replication of the MNE parent's production techniques potentialized technological catching-up. On the other hand, such capital-intensive techniques curbed job creation (Morley & Smith, 1977).

During the ISI phase, the ultimate motive for FDI was tariff-jumping and this inevitably affected the way the relationship between the MNE affiliates and the headquarters evolved. Moreira (1999) argues that in Brazil most MNEs were operating in capital- and technology-intensive industries, but due to overprotection against imports, the ownership advantages of the MNEs were underutilized by their Brazilian affiliates, as demonstrated by their outdated products and processes.

After the early 1980s debt crises, and the exhaustion of the ISI model, which did not create many internationally competitive manufacturing firms, Brazil and Mexico had to reset their development strategies.[8] Mexico soon embarked in a radical shift, characterized by unilateral trade liberalization, relaxation of FDI restrictions, privatization of state-owned enterprises, deregulation, and reduction of state intervention in the economy, making the country a posterchild of what came to be known as the Washington Consensus. A similar set of reforms were undertaken by Brazil, mostly in the 1990s, although often in a softer version than in Mexico.[9]

In Mexico, the previous inward orientation gave way to an economy in which export production became the main driver of economic growth (Hanson, 2002). Merchandise trade (exports plus imports) increased from 10.6% of GDP, in 1976, to 67.1% in 2015. In addition, there was an impressive change in their composition: crude petroleum, which used to account for a large part of Mexican exports until the early 1980s, now accounted for less than 15%, meaning that Mexico's role in the international division of labour was now related to manufacturing. In addition, the country was able to increase the share of medium and high technology goods in its export basket. Nonetheless, the subtle abandonment of the ISI model caused the dismantling of the linkages within the manufacturing sector and the explosion of imports, which was never reversed. The culmination of the radical shift was the signature of the North American Free Trade Agreement (NAFTA), in force from December 1994, which definitively tied the Mexican economy to its major trade partner, the US.[10]

FDI attraction was given a central role in the new development agenda. In Mexico, it went mostly to the manufacturing sector, particularly to the *maquilas* (Máttar et al., 2003), but privatization was also an important pull factor, especially in

[8] Bielschowsky and Stumpo (1995) consider 1981 as the year the ISI model was abandoned in Brazil, but this is controversial because it was not before the Collor de Mello term (1990–1992) that the impediments to trade were seriously withdrawn. Thus, the incentives to restructuring were largely not in place during the 1980s.

[9] An amendment to the Brazilian Constitution sanctioned in 1994 extinguished legal differentiation between national and foreign enterprises. This not only broadened the scope for MNE activities but also gave them access to industrial policy instruments formerly reserved for national firms (Bielschowsky, 1999). In addition, restrictions to FDI in oil and gas extraction, mining, banking and telecommunications were lifted in 1995 (Nonnenberg, 2003).

[10] The synchronization with US economic cycles is clearly exemplified by the deep Mexican recession of 2009, following the subprime crisis in the US.

the early 1990s (Dussel Peters, 2000). According to Máttar et al. (2003), Mexico's export drive was led by subsidiaries of foreign MNEs. More than this, the reconversion of the Mexican economy from an inward-oriented to an export-led one was largely the result of efficiency-seeking FDI led by US MNEs, because trade growth was essentially intrafirm trade growth.

In Brazil, inward FDI decreased to negligible levels during the turbulent 1980s. Only after the Real Plan (*Plano Real*), the currency stabilization program put in place in 1994, FDI surged, reaching a first peak in the period 1997–2000, when several energy and telecommunications companies were privatized. While two-thirds of FDI to Mexico has historically come from the US, in Brazil the sources of FDI were more diversified. In 1990, for example, half of the FDI stock came from Europe, while the US accounted for roughly a third (Bielschowsky, 1994).

Unlike Mexico, Brazil remained largely an inward-oriented economy, as demonstrated by indicators like merchandise trade/GDP, one of the lowest in the world (13.8% in 1990, and 20.4% in 2015). Despite this, trade liberalization—along with other reforms—radically altered MNE activity in Brazil. Increased competition forced rationalization and restructuring. MNEs were predominant in scale-dependent industries, such as consumer durable goods, although these were often operating at inefficient scales. In the new scenario, location advantages became more important, leading to a correction of the prior excessive degree of verticalization and a greater integration of the Brazilian affiliates into MNE networks. This implied rationalization of production—that is, reduction in product portfolios, as well as an increase in outsourcing and imports from the parent and from other affiliates (Moreira, 1999; Nonnenberg, 2003). Nonetheless, MNE strategies remained largely unaltered, as they continued to target the domestic market, with few exceptions.[11]

Despite the diverging strategies followed since the foreign debt crisis, Brazil and Mexico converged in terms of the disappointing growth performance. Indeed, since the 1980s, Brazil and Mexico have been the typical stop-and-go economies. Growth spurts were promptly followed by recessions and crises—in Brazil, growth episodes are sardonically called "chicken flights" due to their short length (Leahy, 2012). The next section analyses the co-evolution between FDI and output and export structures in the period 2000–2015.

4 2000–2015: the co-evolution of FDI and output and export structures

We start by describing the economies of Brazil and Mexico at the turn of the twenty-first century. Second, we consider sectors and industries that received FDI over the period 2000–2015. Finally, we investigate whether production and export structures

[11] Due to arrangements made within Mercosur, MNEs in the automotive sector integrated their operations in the bloc. Apart from this, only MNE affiliates in natural-resource intensive industries, such as mining, paper and pulp, and wood products, had an unequivocal outward orientation (Sarti & Laplane, 2002).

moved in the direction of the sectors that received the most FDI. With respect to production, the paper extends the analysis beyond the industry directly related to FDI, as a means of searching for additional FDI effects through backward linkages. We also investigate whether FDI may have contributed to diversify export structures, especially towards more sophisticated products.

Three sets of data are employed: FDI statistics, provided by national sources (Central Bank of Brazil and Department of Economy of the Government of Mexico); production (value added) and input–output relations, provided by the Organisation for Economic Co-operation and Development (OECD) and by the Brazilian Statistical Office (IBGE); and export statistics, including revealed comparative advantage (RCA), provided by the OECD's Trade in Value Added (TiVA) database and by the Observatory of Economic Complexity (OEC).

4.1 The Brazilian and Mexican economies in 2000

In 2000, 67.7% of the value added in the Brazilian economy came from the services sector, 15.3% came from manufacturing, 10.1% from utilities and construction, 5.5% from agriculture and 1.4% from the extractive mineral sector. In Mexico, the services sector accounted for 60.5% of value added, the manufacturing sector for 20%, utilities and construction for 9.3%, the extractive sector for 6.7% and agriculture for 3.5%. Therefore, at the turn of the 21st Century, Mexico was considerably more industrialized than Brazil, was more dependent of the extractive sectors, especially the oil sector, while in Brazil a larger share of the value added came from services and from the agricultural sector.

FDI stocks grew substantially during the 1990s in both economies, following processes of liberalization and regional integration (NAFTA and Mercosur), besides large privatizations. Data on FDI stocks with sectoral disaggregation is available for Brazil but not for Mexico. As shown in Table 1,[12] the subtle growth in Brazilian inward FDI stock in the late 1990s was accompanied by an impressive change in its sectoral distribution. The share of manufacturing fell from two-thirds of total FDI stock to one-third. In turn, FDI in energy, telecommunications and banking skyrocketed, following privatization of state-owned enterprises. In 2000, Brazil and Mexico had quite similar inward FDI stocks in relative terms. In Brazil, FDI stock was equivalent to 15.8% of GDP. In Mexico, it was 17.2%.

4.2 Where has FDI been directed to since 2000?

Table 2 shows the sectoral distribution of inward FDI flows to Brazil over the period 2001–2014. We note that, after the period of large privatizations, the manufacturing sector increased its share in FDI flows, while the shares of the energy and, especially, the telecommunications sectors decreased substantially, particularly from 2006 onwards. FDI in extractive sectors, which used to be almost insignificant due

[12] The sectors/industries utilised in these Tables are described in the Appendix.

to severe restrictions to foreign activity (a state monopoly prevailed until 1995), jumped after 2000. Within the manufacturing sector, investments were made in food and beverages, chemical and basic metals. In turn, the relative weight of the car industry declined over the period.

The evolution of sectoral FDI flows to Mexico is displayed in Table 3. The picture in Mexico is quite different from Brazil. Not only is the share of the manufacturing sector in total FDI larger than in Brazil, but it increased over the period, accounting for 56% of FDI in 2010–14. Within the manufacturing sector, it can be noted a substantial growth in the importance of the food and beverages sector and an increase in the share of the car industry. Other significant manufacturing sectors are chemicals and computer and electronics industry, which retained their relevance over the period. The mining sector, which was irrelevant in the beginning of the new century, became a relevant recipient of FDI from the second half of the 2000s. In turn, FDI in services declined over the period, largely due to the large reduction in FDI in the financial sector.

4.3 How have the economic structures evolved since 2000?

The evolution of economic structure (understood to mean changes in the sectoral distribution of output over time) depends on the growth of each sector's physical production, and on changes in relative prices. In this context, the first decade of the twenty-first century was marked by a 'double China effect'. On the one hand, international prices of mineral commodities soared in response to the enormous growth in Chinese demand. On the other hand, the relocation of part of the world's manufacturing capacity to developing Asia, especially China, introduced a deflationary trend in the market for certain types of manufactures, particularly those intensive in semi-skilled labour and in assembling activities.

Like most Latin American economies, Brazil benefited from China's growth, especially in the period 2003–2008, when Chinese demand for raw materials and food boosted prices, raising the country's terms of trade. Such an export boom not only alleviated Brazil's chronic balance of payments problem but also pushed the domestic-oriented sectors through wealth effects.

For Mexico, however, China's rise was not so beneficial. The benefits stemming from the upsurge in oil prices were counterbalanced by increased competition imposed by Chinese exports in US manufactures markets. Hanson (2010) argues that Mexico has the bad luck of exporting goods that China sells, instead of goods that China buys.

4.3.1 Brazil: the co-evolution between FDI and output structure

According to Table 4, the share of the extractive sector in Brazilian economy increased substantially in the period 2000–05. As mentioned, even though production expanded, most of the sector's gain in terms of GDP share was due to price rises. The opposite occurred in the period 2010–15, as declines in prices overrode the increases in production. The oil and gas and mining sectors were not historically

Table 1 Brazil: FDI stocks. Source: Central Bank of Brazil (CBB). Available at: https://www.bcb.gov.br/rex/censoce/port/censo.asp?frame=1

Sector	1995			2000		
	Stock US$ M	Share (% of Total)	% of GDP	Stock US$ M	Share (% of Total)	% of GDP
Agriculture and mining	925	2.22	0.119	2401	2.33	0.368
01–03	246	0.59	0.032	384	0.37	0.059
05–06	72	0.17	0.009	1022	0.99	0.157
07–09	607	1.46	0.078	995	0.97	0.153
Manufacturing	27,907	66.93	3.587	34,726	33.71	5.323
10–12	3543	8.50	0.455	5342	5.19	0.819
13–15	1036	2.49	0.133	874	0.85	0.134
16	29	0.07	0.004	240	0.23	0.037
17–18	1772	4.25	0.228	1764	1.71	0.270
19	0	0.00	0.000	1	0.00	0.000
20–21	5331	12.79	0.685	6043	5.87	0.926
22	1539	3.69	0.198	1782	1.73	0.273
23	854	2.05	0.110	1170	1.14	0.179
24	3005	7.21	0.386	2513	2.44	0.385
25	573	1.37	0.074	593	0.58	0.091
28	2345	5.62	0.301	3324	3.23	0.510
26	1412	3.39	0.181	3186	3.09	0.488
27	1101	2.64	0.141	990	0.96	0.152
29	4838	11.60	0.622	6351	6.17	0.974
30	223	0.53	0.029	356	0.35	0.055
31–33	308	0.74	0.040	195	0.19	0.030
Utilities, construction and services	12,864	30.85	1.653	65,888	63.96	10.100
35–39	4	0.01	0.001	7384	7.17	1.132
41–43	203	0.49	0.026	416	0.40	0.064
45–47	2886	6.92	0.371	10,240	9.94	1.570
49–53	193	0.87	0.047	495	0.48	0.049
55–56	364	0.46	0.025	317	0.31	0.076
61	399	0.96	0.051	18,762	18.21	2.876
62–63	115	5.22	0.280	2543	2.47	1.939
64–66	2178	2.66	0.143	12,652	12.28	0.122
68	1109	0.28	0.015	798	0.77	0.390
69–82	5322	12.76	0.684	11,838	11.49	1.815
85	1	0.00	0.000	6	0.01	0.001
86–88	18	0.04	0.002	70	0.07	0.011
Other services	72	0.17	0.009	369	0.36	0.056
Total	41,696	100.00	5.359	103,015	100.00	15.791

The source of GDP used in this table is UNCTAD (https://unctadstat.unctad.org/EN/)

Author's elaboration

Other services include sectors 90–98

Table 2 Brazil: FDI flows. Source: Central Bank of Brazil (CBB). Available at: https://www.bcb.gov.br/htms/infecon/seriehistfluxoinvdir.asp?frame=1

Sector	2001–2005			Sector	2006–2009			2010–2014		
	Annual Average US$ M	Share (% of Total)	% of GDP		Annual Average US$ M	Share (% of Total)	% of GDP	Annual Average US$ M	Share (% of Total)	% of GDP
Agriculture and mining	1376	7.19	0.215		5971	17.93	0.407	9739	16.86	0.399
01–03	190	0.99	0.030	01–03	500	1.50	0.034	671	1.16	0.027
05–06	683	3.57	0.107	05–06	1331	4.00	0.091	5770	9.99	0.236
07–09	503	2.63	0.079	07–09	4140	12.43	0.282	3298	5.71	0.135
Manufacturing	7265	37.95	1.138		12,359	37.10	0.843	20,491	35.46	0.838
10–12	2053	10.72	0.322	10–12	1375	4.13	0.094	3755	6.50	0.154
13–15	73	0.38	0.011	13–15	215	0.65	0.015	67	0.12	0.003
16	59	0.31	0.009	16	101	0.30	0.007	123	0.21	0.005
17–18	267	1.39	0.042	17–18	892	2.68	0.061	576	1.00	0.024
20–21	1232	6.44	0.193	19	1204	3.61	0.082	1078	1.87	0.044
22	236	1.23	0.037	20–21	1515	4.55	0.103	3990	6.91	0.163
23	108	0.56	0.017	22	455	1.37	0.031	695	1.20	0.028
24	410	2.14	0.064	23	370	1.11	0.025	771	1.33	0.032
25	98	0.51	0.015	24	3787	11.37	0.258	4391	7.60	0.180
26	579	3.03	0.091	25	105	0.31	0.007	315	0.55	0.013
27	259	1.35	0.041	26	247	0.74	0.017	1097	1.90	0.045
28	312	1.63	0.049	27	337	1.01	0.023	610	1.06	0.025
29	1246	6.51	0.195	28	421	1.26	0.029	726	1.26	0.030
Other manuf	334	1.74	0.052	29	1070	3.21	0.073	1593	2.76	0.065
				30	63	0.19	0.004	237	0.41	0.010
				31–33	202	0.61	0.014	466	0.81	0.019

Table 2 (continued)

Sector	2001–2005			Sector	2006–2009			2010–2014		
	Annual Average US$ M	Share (% of Total)	% of GDP		Annual Average US$ M	Share (% of Total)	% of GDP	Annual Average US$ M	Share (% of Total)	% of GDP
Utilities, construction and services	10,504	54.87	1.645		14,980	44.97	1.021	27,551	47.68	1.127
35–39	1314	6.86	0.206	35–39	1353	4.06	0.092	2139	3.70	0.088
41–43	223	1.17	0.035	41–43	1263	3.79	0.086	1566	2.71	0.064
45–47	1617	8.45	0.253	45–47	2364	7.10	0.161	5448	9.43	0.223
49–53	184	0.96	0.029	49–53	676	2.03	0.046	1647	2.85	0.067
55–56	155	0.81	0.024	55–56	246	0.74	0.017	307	0.53	0.013
61	3612	18.87	0.566	58–60	0	0.00	0.000	103	0.18	0.004
62–63	265	1.38	0.041	61	630	1.89	0.043	2587	4.48	0.106
64–66	1645	8.59	0.258	62–63	395	1.19	0.027	747	1.29	0.031
68	203	1.06	0.032	64–66	4519	13.57	0.308	5941	10.28	0.243
69–82	809	4.23	0.127	68	1007	3.02	0.069	2216	3.84	0.091
Other services	478	2.50	0.075	69–82	1598	4.80	0.109	3139	5.43	0.128
				85	80	0.24	0.005	340	0.59	0.014
				Other services	847	2.54	0.058	1372	2.37	0.056
Total	19,145	100.00	2.998	Total	33,310	100.00	2.271	57,782	100.00	2.364

The source of GDP used in this table is UNCTAD (https://unctadstat.unctad.org/EN/)

Author's elaboration

1. The data used in this table refer to equity investment only, that is, do not include intercompany loans, 2. CBB changed the level of disaggregation of FDI flows data from 2006 onwards, 3. For the purpose of this study, all the FDI in the primary sector not included explicitly in mining was considered in sector 01–03, 4. For the period 2001–2005, other manufacturing probably includes all the sectors not explicitly identified, which include sectors 19 and 30–33, 5. For the period 2001–2005, other services probably includes all the sectors not explicitly identified, which include sectors 84 onwards, 6. For the period 2006–2014, other services probably includes all the sectors not explicitly identified, which include sector 84 and 86 onwards

Table 3 Mexico: FDI flows. Source: Government of Mexico, Department of Economy, Open Data. Available at: https://datos.gob.mx/busca/dataset/informacion-estadistica-de-la-inversion-extranjera-directa/resource/06ad9dbb-cbd2-4b17-9586-daf78326308a

Sector	2000–2004			2005–2009			2010–2014		
	Annual average US$ M	Share (% of Total)	% of GDP	Annual Average US$ M	Share (% of Total)	% of GDP	Annual average US$ M	Share (% of Total)	% of GDP
Agriculture and mining	241	1.04	0.032	1744	6.85	0.177	2886	9.41	0.239
01–03	43	0.19	0.006	34	0.13	0.003	158	0.52	0.013
05–06	4	0.02	0.001	6	0.02	0.001	59	0.19	0.005
07–08	186	0.80	0.025	1,658	6.52	0.169	2,568	8.38	0.213
09	7	0.03	0.001	46	0.18	0.005	101	0.33	0.008
Manufacturing	9797	42.33	1.307	10,899	42.85	1.109	17,195	56.08	1.426
10–12	1958	8.46	0.261	1738	6.83	0.177	6,127	19.98	0.508
13–15	398	1.72	0.053	258	1.01	0.026	172	0.56	0.014
16	2	0.01	0.000	4	0.02	0.000	28	0.09	0.002
17–18	288	1.24	0.038	226	0.89	0.023	317	1.03	0.026
19	26	0.11	0.003	– 13	– 0.05	– 0.001	21	0.07	0.002
20–21	1508	6.52	0.201	1631	6.41	0.166	2233	7.28	0.185
22	204	0.88	0.027	539	2.12	0.055	724	2.36	0.060
23	327	1.41	0.044	169	0.66	0.017	129	0.42	0.011
24	227	0.98	0.030	1501	5.90	0.153	670	2.19	0.056
25	177	0.76	0.024	249	0.98	0.025	313	1.02	0.026
26	962	4.16	0.128	1186	4.66	0.121	1128	3.68	0.094
27	674	2.91	0.090	550	2.16	0.056	574	1.87	0.048
28	529	2.29	0.071	351	1.38	0.036	574	1.87	0.048
29	2078	8.98	0.277	2039	8.02	0.207	3489	11.38	0.289
30	82	0.35	0.011	217	0.85	0.022	265	0.87	0.022
Other manuf	357	1.54	0.048	255	1.00	0.026	431	1.41	0.036

Table 3 (continued)

Sector	2000–2004			2005–2009			2010–2014		
	Annual average US$ M	Share (% of Total)	% of GDP	Annual Average US$ M	Share (% of Total)	% of GDP	Annual average US$ M	Share (% of Total)	% of GDP
Utilities, construction and services	13,104	56.63	1.748	12,794	50.30	1.301	10,578	34.50	0.877
35–39	468	2.02	0.062	429	1.69	0.044	853	2.78	0.071
41–43	268	1.16	0.036	1015	3.99	0.103	1116	3.64	0.093
45–47	1796	7.76	0.240	1437	5.65	0.146	2323	7.58	0.193
49–53	221	0.95	0.029	820	3.22	0.083	1161	3.79	0.096
55–56	652	2.82	0.087	1249	4.91	0.127	1166	3.80	0.097
58–60	189	0.82	0.025	– 35	– 0.14	– 0.004	331	1.08	0.027
61	1629	7.04	0.217	872	3.43	0.089	399	1.30	0.033
62–63	35	0.15	0.005	0	0.00	0.000	41	0.13	0.003
64–66	6857	29.63	0.915	4545	17.87	0.462	1446	4.72	0.120
68	516	2.23	0.069	1524	5.99	0.155	738	2.41	0.061
69–82	412	1.78	0.055	774	3.04	0.079	817	2.66	0.068
85	10	0.04	0.001	47	0.19	0.005	10	0.03	0.001
86–88	5	0.02	0.001	11	0.04	0.001	16	0.05	0.001
90–96	11	0.05	0.002	74	0.29	0.008	68	0.22	0.006
Other services	36	0.15	0.005	32	0.12	0.003	95	0.31	0.008
Total	23,142	100.00	3.087	25,436	100.00	2.587	30,659	100.00	2.543

The source of GDP used in this table is UNCTAD (https://unctadstat.unctad.org/EN/)

Author's elaboration

1. Other manufacturing includes undisclosed values due to confidentiality, 2. Other services includes undisclosed values due to confidentiality

Table 4 Brazil: the evolution of economic structure and input–output relations. Source: IBGE, Annual National Accounts and Input–Output Tables. Available at: https://ibge.gov.br

Sector	Sector share in VA (% of Total)				Sector VA real growth (%)			Sector's domestic demand of inputs—real growth (%)		
	2000	2005	2010	2015	2000–05	2005–10	2010–15	2000–05	2005–10	2010–15
01–03	5.52	5.48	4.84	5.02	26.94	17.38	17.82	31.02	– 3.57	30.80
05–06	1.01	2.36	1.92	1.43	38.49	26.89	13.76	139.01	– 8.60	27.66
07–09	0.37	0.79	1.41	0.72	22.23	28.15	10.57	26.73	7.10	0.77
10–12	1.75	2.38	2.38	2.40	20.78	4.88	– 8.01	28.35	3.80	8.93
13–15	1.81	1.34	1.32	1.01	– 5.67	4.66	– 14.44	1.77	– 9.73	– 9.72
16	0.32	0.35	0.26	0.19	8.39	– 16.71	– 2.74	42.62	– 29.17	– 0.73
17–18	1.13	0.89	0.69	0.60	28.00	7.28	– 7.63	15.95	– 8.43	– 7.20
19	1.10	1.50	0.66	0.87	22.85	– 22.23	0.20	– 8.36	68.53	– 0.46
20–21	2.00	2.30	1.52	1.40	12.57	12.84	2.22	9.60	2.02	8.26
22	0.58	0.65	0.65	0.51	4.83	12.07	– 14.85	7.75	24.46	0.69
23	0.58	0.47	0.68	0.54	7.14	20.75	– 4.81	– 10.40	29.89	8.23
24	0.53	1.27	0.73	0.67	16.58	0.02	– 11.68	18.10	4.97	– 8.57
25	0.90	1.13	0.89	0.67	24.91	21.95	– 7.55	– 15.20	28.67	– 18.47
26	0.53	0.62	0.60	0.44	29.72	13.94	31.60	4.17	– 26.69	31.80
27	0.41	0.40	0.44	0.33	22.76	13.47	– 8.52	– 5.99	18.88	– 13.54
28	1.11	1.33	1.45	1.16	18.98	22.81	– 11.41	13.04	21.67	– 14.68
29	1.33	1.58	1.88	0.79	43.46	34.38	– 38.32	53.47	10.24	– 23.24
30	0.35	0.47	0.29	0.23	46.72	55.94	6.28	48.81	25.21	25.97
31–33	0.83	0.67	0.54	0.44	6.03	22.98	– 14.70	– 8.60	98.85	9.05
35–39	3.14	3.37	2.81	2.39	9.16	21.38	5.51	11.92	26.90	46.09
41–43	6.96	4.59	6.27	5.74	1.76	39.03	3.93	– 20.84	87.95	0.96
45–47	8.11	10.76	12.60	13.30	11.60	29.94	0.99	24.26	80.82	22.08
49–53	3.67	3.49	4.29	4.39	11.27	23.18	6.04	25.90	45.78	– 3.22

Table 4 (continued)

Sector	Sector share in VA (% of Total)				Sector VA real growth (%)			Sector's domestic demand of inputs—real growth (%)		
	2000	2005	2010	2015	2000–05	2005–10	2010–15	2000–05	2005–10	2010–15
55–56	2.19	1.60	2.13	2.38	18.08	23.82	6.49	– 15.11	8.81	9.32
58–63	4.28	4.56	3.83	3.41	27.70	24.02	23.57	35.36	35.69	2.90
64–66	6.83	7.14	6.80	7.09	11.64	67.78	7.86	– 8.85	55.96	4.01
68	12.23	9.32	8.31	9.68	22.31	21.54	13.00	28.28	36.20	48.87
69–82	6.15	5.78	6.71	7.02	11.16	29.24	8.02	6.32	71.03	16.57
84	10.10	10.80	10.39	9.88	16.12	15.94	7.77	31.30	– 1.56	1.87
85	5.37	4.59	4.97	6.48	14.00	– 3.51	1.49	25.76	10.44	14.18
86–88	4.04	3.75	3.92	4.90	16.35	23.40	10.18	28.96	5.37	12.30
90–96	3.57	3.06	2.62	2.74	6.93	14.92	8.20	4.22	4.59	– 7.38
97–98	1.17	1.20	1.22	1.20	20.47	8.42	2.24	–	–	–
Total economy	100	100	100	100	15.85	22.72	5.51	–	–	–

Authors' elaboration

Sectoral value added deflators were used to deflate sectoral output

significant recipients of FDI in Brazil, largely due to state monopoly and other restrictions to foreign activity. As shown in Table 1, they accounted for less than 1% (each) of FDI stock in 2000. However, this picture changed in the two decades after. In the period 2006–09, 12.4% of inward FDI went to the mining sector. Likewise, 10% went to oil and gas in the period 2010–14. These flows were not only attracted by the record prices and the removal of restrictions, but also—in the case of oil and gas—by the discovery of large reserves in the pre-salt layer. These sectors, which received disproportionate FDI flows (relatively to the weight in the economy), grew considerably faster than the rest of the economy and—what is particularly important for this study—created demand for upstream industries. For example, as indicated in Table 4, the domestic purchases of the oil and gas sector increased impressive 139% in the period 2000–05 in real terms. Therefore, besides the possible effects on the sectors itself, FDI in oil & gas and mining possibly affected other industries through backward linkages. Nevertheless, the proportion of foreign inputs in total inputs used in these sectors increased over time, despite the minimum local content policy imposed by the Brazilian government to the suppliers of Petrobras and of other oil drilling operators.[13] Given the importance of this policy in the Brazilian context, it is worth analysing it in greater detail.

Regarding employment, the largest multiplier effects of oil and gas production are found in upstream industries (Piquet et al., 2016). For this reason, many oil-rich countries implement domestic content policies as a means of maximizing the benefits of resource abundance (Tordo et al., 2013). In Brazil, these policies have been in place since the 1970s (Florencio, 2016), but they acquired more relevance after the abolition of Petrobras' monopoly in 1995. Since then, all public biddings for new exploration and development blocs have included minimum local content requirements. During the Workers' Party's ruling years (2003–2016), especially after the discovery of the huge oil reserves of the pre-salt layer (2007), these policies became a central pillar of the country's overall industrial policy (Schutte, 2021). In some bidding rounds, local content commitments exceeded 85% (Schutte, 2021). However, the results of such policy are rather controversial. Although it fostered the development of supplier industries, such as shipbuilding, the prices were considerably above the international prices and the quality of goods and services typically lower. Thus, while the policy may have induced FDI in supplier industries (Piquet et al., 2016), it also made oil extraction less attractive to foreign MNEs (Clavijo et al., 2019), thus reducing competition in bids (Tordo et al., 2013). The lack of focus on a selected few industries or products with a greater potential to engender competitive producers has been pointed out as the main fault of a policy that seems to have overestimated the capacity of the domestic industry in meeting its high targets (Florencio, 2016).

Over the period 2000–15, the manufacturing sector's share in FDI flows remained relatively unaltered, slightly above one-third of the total. Within manufacturing, the food and beverage and the chemical industries were prominent over this entire

[13] It must be noted that input–output matrix is not the best tool for evaluating the effects of sectoral minimum domestic content policies because they do not indicate the origin of second-, third-, fourth-tier suppliers.

period, while the car industry stood out in the period 2001–05 and the basic metals industry stood out in subsequent periods. Interestingly, the distribution of FDI was not well mirrored in the relative performances of manufacturing industries. Some of the best performing industries over the period 2000–10, such as metal products and machinery, were not prominent FDI recipients. A stronger connection, however, is likely to exist between FDI flows and the economic performance of the computers, optical and electronic equipment industry, especially in the period 2000–05, when Brazil became an exporter of early mobile phones, a position that it lost completely after the emergence of the smart phone. It must be noted, however, that the linkages of this sector with the rest of the economy are weak (Table 4)—indeed, this industry's growth has been accompanied by an increasing use of imported inputs (Table 5).

The basic metals industry was a prominent recipient of FDI, especially after 2005. However, production did not increase, even during the booming years of the Brazilian economy. Another important FDI recipient, the chemical industry, also underperformed relatively to the overall economy and even to some other manufacturing industries.

Given its substantive potential for creating backward linkages, the automotive industry deserves a detailed analysis, even though it has not been a major recipient of FDI, as revealed by official statistics. Deeply linked to Brazil's industrialization, this industry has been favoured by continuous protectionist policies since its early days and despite some isolated unsuccessful national initiatives, has always remained under the control of the large developed country MNEs. During the 2000s, the Brazilian auto industry benefited from the rise in employment and income propelled by the commodities boom and the expansion of consumer credit. The sector's output grew much faster than the overall economy: annual production started the decade around 1.5 million units, reaching a peak of 3.7 million in 2013. In 2013, Brazil became the fourth largest market in the world. However, the economic crisis that hit Brazil in 2014–16, hit the car market especially hard. Sales plummeted 45% in three years, leaving the industry with a huge idle capacity.

Since the 1990s, Brazil passed through three waves of FDI in the auto industry. In all of them, the new investments—both the volume and the location within Brazil—were strongly influenced by tax and financial incentives offered by subnational governments, which were complemented by tax exemptions and trade protection offered by the federal government. The first wave took place in the second half of the 1990s, following a major rise in import tariffs in response to a surge in imports (De Negri, 1999). Several makers that were not previously present in Brazil built plants to produce locally, including some high-end brands. The expansion in industry's capacity was initially accompanied by fast sales growth, but this movement was suddenly reversed by the 1999 crisis that led to a major devaluation of the real and a substantial decrease in domestic sales. A new cycle of investments started in the mid-2000s—when the idle capacity of the sector was largely suppressed—involving mainly incumbent producers. Backward linkages were strengthened during these boom years—as shown in Table 5, the use of imported inputs decreased, while the use of domestically-sourced ones increased. Finally, the third wave took place in the 2010s, when a new industrial policy, labelled Inovar-Auto, was adopted by the

federal government. For its importance within the country's industrial policy—whose main developments are described in Box 1—this initiative is examined in greater detail.

Inovar-Auto was created in 2012, in response to an upsurge in car imports from China, Mexico, and South Korea. Officially, its purposes were to encourage investments, raise the domestic content in final products and improve the international competitiveness of the industry (Sturgeon et al., 2017). However, since its inception it has been criticized for its heavy protectionist nature, the high fiscal cost, and the lack of ambitious targets. Indeed, Inovar-Auto introduced a tricky mechanism that, in the end, imposed a surcharge of 30% on cars imported by companies that did not have a local production plant, in addition to the high regular import tariff of 35%.[14] To mask the protectionist intention, the program also included a few unambitious targets in respect to R&D expenditure and energy efficiency.

The program did not produce compelling results. Imports were curbed and effectively a new wave of FDI occurred. New producers, including a few in the luxury segment, arrived in the country, helping to expand the industry's capacity to above 5 million vehicles per year. Sturgeon et al. (2017) estimate that half of the new investments were induced by Inovar-Auto. The program, however, deepened the excess capacity problem that already existed, as it encouraged tariff jumping FDI that resulted in small plants chronically unable to operate at efficient scale. The strengthening of the linkages did not take place—both investments and employment in the auto parts industry declined during the program's duration (Messa, 2017; Vargas, 2021). Likewise, exports did not expand, and the Brazilian industry did not increase its participation in the related GVC (Sturgeon et al., 2017). Moreover, R&D efforts did not increase—indeed, they decreased.[15] The program was even condemned by the WTO in 2016.

Electricity and telecommunications were two of the main targets of foreign investors in Brazilian economy during the late 1990s. Most were through acquisitions of formerly state-owned enterprises. However, since these early investments, the acquirers have made new investments in the modernization and expansion of the existing networks, as per the privatization contracts. During the period 2001–05, value-added by the energy sector grew slower than the overall economy. However, the main reason for the unexpected slow growth were the changes in the patterns of energy demand that followed the rationing caused by the 2001 drought. For the telecommunications sector,[16] the connection between output growth and FDI is clearer, particularly in the years that followed privatization, as foreign investors had a large

[14] Formally, the tax levied on industrial goods increased by 30 percentage points, but the program also reduced it by the same amount if at least 80% of the cars sold by the company were produced in the country. The program also introduced a local content requirement that would increase over time (Sturgeon, Chagas & Barnes, 2017).

[15] Even though the industry's R&D expenditure in the period 2009–2011 was 1.57% of net sales, the program imposed a 0.5% target for 2017. In the period 2015–2017, that figure dropped to 1.25% (Vargas, 2021).

[16] Unfortunately, IBGE does not provide separate statistics for the telecommunications sector, only for the broader information services sector, which includes IT services as well as publishing, audiovisual and broadcasting activities.

Table 5 Brazil: decomposition of the output (%). Source: IBGE, Input–Output Tables. Available at: https://ibge.gov.br

Sector	Domestic inputs				Foreign inputs				Gross value added			
	2000	2005	2010	2015	2000	2005	2010	2015	2000	2005	2010	2015
01–03	35.55	41.15	37.90	39.75	1.60	1.36	3.21	5.73	59.77	54.07	58.89	54.52
05–06	40.45	47.37	39.95	45.08	8.60	7.84	9.55	14.07	49.03	42.49	50.50	40.86
07–09	52.12	52.02	30.95	45.26	2.66	2.74	6.42	9.89	42.37	42.28	62.63	44.86
10–12	73.61	74.39	59.35	57.15	3.82	2.58	2.65	3.13	19.42	19.83	38.00	39.73
13–15	53.23	55.07	37.72	35.58	6.09	5.05	6.57	7.11	37.99	36.78	55.71	57.31
16	49.10	57.92	47.34	47.61	1.78	1.75	2.80	4.68	46.68	37.25	49.86	47.71
17–18	50.47	53.55	52.14	47.00	6.27	6.56	6.89	9.66	40.82	37.05	40.97	43.34
19	66.33	65.04	53.84	54.57	14.15	15.72	9.24	7.56	12.58	13.04	36.92	37.88
20–21	55.48	55.94	43.93	43.08	14.26	15.14	15.64	19.03	28.38	26.36	40.44	37.90
22	61.41	60.00	52.44	51.34	10.19	9.16	11.99	16.90	25.36	28.05	35.57	31.76
23	57.68	56.46	51.23	51.48	3.77	4.61	5.46	6.34	37.18	36.81	43.31	42.18
24	55.16	56.01	67.05	66.17	11.05	12.45	12.89	15.16	31.15	28.69	20.07	18.67
25	52.66	51.60	45.73	43.35	6.18	3.64	6.51	7.72	38.32	42.19	47.76	48.93
26	46.27	49.00	30.09	31.18	25.52	26.58	28.92	33.49	24.76	20.13	40.99	35.33
27	57.07	57.28	48.54	45.64	12.48	9.20	11.91	13.91	27.51	30.73	39.55	40.45
28	55.59	60.00	46.97	44.67	7.15	8.30	13.54	17.45	33.88	28.38	39.49	37.88
29	58.99	68.98	54.92	53.46	15.88	12.11	9.80	16.09	20.81	15.16	35.28	30.45
30	36.26	58.05	44.49	47.18	32.29	15.72	15.82	21.50	27.62	22.73	39.68	31.33
31–33	49.65	48.70	32.41	30.93	4.97	5.02	8.13	11.05	42.11	42.22	59.46	58.03
35–39	41.47	41.27	40.76	47.05	5.11	4.16	4.73	7.75	52.06	53.05	54.52	45.20
41–43	41.72	36.84	50.48	49.43	2.63	2.79	4.47	5.77	50.02	53.81	45.05	44.80
45–47	25.05	25.19	36.65	37.89	1.18	1.47	2.63	4.06	70.10	69.88	60.72	58.05
49–53	40.79	44.40	49.64	49.70	3.64	1.46	5.87	6.62	53.92	50.56	44.48	43.67
55–56	49.05	49.11	46.14	46.37	0.57	0.69	5.16	5.95	42.36	43.02	48.70	47.68
58–63	41.43	40.89	39.31	37.63	3.97	4.41	4.22	6.71	52.26	52.20	56.47	55.66
64–66	39.86	29.49	32.79	31.71	2.02	2.10	1.92	1.92	54.74	65.19	65.29	66.37
68	4.27	5.21	6.58	7.70	0.18	0.21	0.30	0.48	95.13	94.13	93.12	91.83
69–82	34.46	30.71	29.95	29.07	2.17	2.20	2.54	3.33	59.75	62.11	67.51	67.59
84	31.92	32.72	29.88	29.36	0.95	0.88	1.81	2.57	64.05	62.31	68.31	68.07
85	21.67	24.24	25.32	20.19	0.52	0.63	1.58	2.42	75.20	71.61	73.09	77.39
86–88	35.95	39.59	39.84	35.90	2.80	3.53	5.25	5.22	57.59	52.56	54.92	58.88
90–96	33.10	31.37	42.32	41.08	1.17	1.80	6.84	7.37	60.57	61.29	50.84	51.54
97–98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00

Authors' elaboration

For 2000 and 2005, the difference between output and the components is comprised by taxes, subsidies, trade margins and transport margins

pool of unserved consumers to be exploited. When the Telebras system was privatized in 1998, Brazil had approximately 4 million mobile lines. In 2005, there were 86 million and, by 2010, the number reached 203 million lines, more than a line per

capita. The expansion of information services created demand for domestic inputs, as shown in Table 5.

The financial sector was an important recipient of FDI over this period. However, it is hard to relate these flows to the sector's performance because the Brazilian banking market is largely dominated by domestic actors, with the largest foreign player (Santander) as only the fifth largest commercial bank. The sector's spectacular growth in the period 2005–10 (Table 4), was primarily driven by the expansion of the balance sheets of state banks, notably BNDES, the federal development bank.

Finally, another sector that received substantial FDI flows in Brazil is wholesale and retail trade. Indeed, some of the world biggest supermarket chains, such as Wal-Mart, Carrefour and Cassino accelerated expansion in the country through acquisitions and the opening of new stores. Nonetheless, it is not easy to trace a relation between FDI and growth in value added because this sector's margins are very sensitive to the business cycle.

Box 1: industrial policy in Brazil since the end of the ISI era

Over the 1980s, the instruments used by industrial policy in Brazil remained largely the same employed in previous decades, although a greater relevance was given to export incentives after the foreign debt crisis. Nonetheless, industrial development had lost its outstanding place among the country's leaders' priorities. Indeed, during the 1980s and the 1990s, Brazilian government's efforts were mostly directed to macroeconomic stabilization. Thus, with the State facing growing fiscal constraints, existing public programs were underfunded, and several sectoral programs were simply abandoned.

A radical shift occurred when Fernando Collor de Mello (1990–1992) assumed the country's presidency. The new leadership viewed developmentalism and economic planning as outdated. Furthermore, the image of sectoral policies had been severely harmed by the 1980s IT industry policy that prevented price cuts and delayed the dissemination of efficiency-enhancing devices within the whole economy. Collor de Mello's new trade and industrial policy, announced in 1990, represented a rupture with the logic that governed Brazil's industrial policy as it shifted the concerns from the expansion of manufacturing capacity to the promotion of efficiency and competitiveness (Guimarães, 1996). Deregulation and trade liberalization formed its key elements, but they were complemented by instruments to foster efficiency, such as the Brazilian Program for Quality and Competitiveness. Incentives for investing and exporting were reconsidered, and several sectoral programs were dismantled.

However, aversion to industrial policy had not yet reached its height. During Fernando Henrique Cardoso's (1995–2002) presidency, the Ministry of Economy, led by Pedro Malan, obstructed any discussion about industrial policy—Malan's assertion that "the best industrial policy is not having an industrial policy" became notorious (Suzigan & Furtado, 2006). In 1998, Cardoso launched a new industrial policy, but, to a large extent, it was simply a deepening of Collor de Mello's approach, which views no role for State intervention beyond the

promotion of competition and investment in infrastructure and in human capital formation. Pushed by Brazilian entrepreneurs, which were struggling to survive in an economic environment characterized by very high real interest rates and overvalued currency, Cardoso took some initiatives to compensate domestic firms, such as a simplified tax system for small firms and export credit but no industry-specific program was implemented until the creation of the sectoral funds, near the ending of his second term (Arbix, 2010). In addition, BNDES—the Brazilian development bank that played an important role during the II PND—was virtually transformed into an investment bank, following a strict financial logic, instead of operating as a traditional development bank. In such a context, the financial and fiscal incentives provided by State and municipal governments to attract investments, especially FDI, increasingly substituted for the (absent) industrial policy at the national level.

Industrial policy underwent a revival in the twenty-first Century, during the Workers' Party's ruling years. In 2004, during Luiz Inácio Lula da Silva's first term (2003–2006), a first attempt to restore State capacity in the formulation, coordination and implementation industrial policy was launched: the Trade, Technology and Industrial Policy (*Política Industrial, Tecnológica e de Comércio Exterior*—PITCE). As stated by Suzigan et al. (2020), its main challenge was to roll back the existing anti-industrial policy bias. Compared to the plans that followed, PITCE had a modest scope. Focusing on fostering a favourable environment for innovation and technological development (Stein & Herrlein Júnior, 2016), it attacked on three fronts: horizontal measures (innovation, exports, small and medium enterprises); promotion of strategic sectors (capital goods, IT, semiconductors and pharma), in which the country was presenting large and increasing trade deficits (Kupfer et al., 2013); and development of the industries of the future (biomass, biotechnology, nanotechnology and renewable energy). The PITCE was complemented by other initiatives, such as the Innovation Law (2004) and the Law of Goodness (*Lei do Bem*) (2005), which introduced several instruments to incentivize innovative activities within firms.

In 2008, during Lula da Silva's second term (2007–2010), the Productive Development Policy (*Política de Desenvolvimento Produtivo*—PDP) was launched. Embedded in a more favourable economic context, the government was committed to creating mechanisms to raise investment rates and accelerate GDP growth (Suzigan et al., 2020). Previous focus on a few strategic industries was abandoned as the number of industries "prioritized" jumped to 25—ranging from industries in which the country already had comparative advantage, such as paper and pulp, animal protein, mining, and steel, to industries vulnerable to international competition, such as textiles, automotive, shipbuilding and capital goods (Guimarães, 2021). An unspoken policy for fostering leading companies at the global stage—or national champions—was carried out, but the beneficiaries were firms of low and mid tech industries. Subsidized BNDES' loans became the main industrial policy instrument, but the government increasingly used its purchase power, coupled with national content requirements, to promote specific industries such as capital goods and shipbuilding. The role of innovation as the key

driver of industrial policy was neglected as PDP increasingly worked as a countercyclical policy, following the global financial crisis of 2008–2009. As such, targets and requirements were overlooked—thus echoing a key flaw of the ISI era—while subsidies and trade protectionism were increasingly revived (Suzigan et al., 2020).

The Greater Brazil Plan (*Plano Brasil Maior*—PBM) was launched in 2011, the first year of Dilma Rousseff's first term (2011–2014). In broad terms, it did not differ significantly from its predecessor, but since it was adopted in a less favourable domestic economic and political environment, in practice it had a strong defensive nature (Guimarães, 2021). Antidumping was revived as an important protectionist tool, payroll taxes were curtailed to reduce costs and improve competitiveness, public procurement was given a greater role in industrial policy (Stein & Herrlein Júnior, 2016; Suzigan et al., 2020). Pressed by growing domestic political instability, the implementation of the PBM lacked coherence and was too responsive to short-sights pressures, as exemplified by the botched cuts in energy prices in 2013. Increasing interventionism affected resource allocation, with likely negative effects on GDP growth.

4.3.2 Brazil: the co-evolution between FDI and export structure

Table 6 shows the evolution of Brazil's exports with a growing dominance of the primary sector. In addition, the share of manufactures declined over time, particularly of metals, machines, transportation, wood products and footwear. Exports became more concentrated, as expressed by the decreasing number of products (at the HS4 6-digit level) for which Brazil possess revealed comparative advantage (RCA).[17]

A similar pattern is revealed by Table 7, which gives sectoral RCA indexes based on value added, instead of gross exports. Again, the primarization is evident, as the only manufacturing segment that grew rapidly was the natural resource-intensive pulp and paper industry.

Investments in the manufacturing sector do not seem to have contributed to change Brazil's export structure toward technologically advanced manufactured goods. Indeed, FDI in this area is predominantly domestic market-seeking. Resource-seeking FDI is restricted to a few manufacturing segments strongly dependent on natural resources, such as basic metals, paper products, sugar, and soybean meal. In the early 2000s, Brazil expanded car sales to Latin American countries and was even able to export to Germany a model created in the country by Volkswagen. This movement, however, was already largely reversed by the late 2000s, and Argentina remained the sole relevant export market for vehicles and auto parts made in Brazil.

[17] The RCA index for a given industry is obtained by dividing the country's share in the world's exports of that industry by the country's share in world's total exports. It is assumed that the country's comparative advantage in a given industry is "revealed" by the RCA index when it exceeds 1 (Balassa, 1965).

Table 6 Brazil: The evolution of export structure and RCA. Source: The Observatory of Economic Complexity. Available at: https://oec.world/en

Section		Number of HS4 (6-digit) with RCA > 1				Share in total exports (%)—HS4 (6-digit) with RCA > 1				Share in total exports (%)—HS4 (6-digit) with RCA ≤ 1			
		1999	2005	2010	2015	1999	2005	2010	2015	1999	2005	2010	2015
1.	Animal products	13	16	16	18	3.30	6.31	6.40	7.39	0.32	0.31	0.19	0.16
	Frozen bovine meat					0.64	1.48	1.63	2.04	–	–	–	–
	Poultry meat					1.87	2.88	2.88	3.31	–	–	–	–
2.	Vegetable Products	16	21	16	15	8.74	7.40	9.54	17.23	0.43	0.31	0.47	0.61
	Coffee					4.58	2.11	2.55	2.95	–	–	–	–
	Corn					–	0.22	1.12	2.65	0.07	–	–	–
	Soybeans					3.24	4.38	5.37	10.78	–	–	–	–
3.	Animal and vegetable bi-products	6	10	5	5	1.67	1.25	0.74	0.75	0.09	0.05	0.10	0.14
4.	Foodstuffs	21	18	18	19	14.31	10.73	13.11	11.85	0.67	0.49	0.56	0.49
	Fruit juice					3.07	1.07	1.11	1.31	–	–	–	–
	Raw sugar					3.98	3.49	6.38	4.25	–	–	–	–
	Soybean meal					3.09	2.45	2.39	3.09	–	–	–	–
5.	Mineral Products	16	13	14	19	6.55	7.04	23.65	15.25	0.96	6.09	1.82	1.06
	Iron ore					5.57	6.14	14.47	7.42	–	–	–	–
	Crude petroleum					–	–	7.96	6.08	0.05	3.47	–	–
6.	Chemical products	40	37	28	30	3.59	2.67	2.90	2.95	2.26	2.13	2.34	2.53
7.	Plastics and rubbers	6	8	6	8	1.78	1.63	1.43	1.77	1.14	1.25	1.24	0.93
8.	Animal hides	6	7	8	5	1.33	1.26	0.89	1.19	0.07	0.05	0.02	0.04
9.	Wood products	13	13	7	11	2.76	2.49	0.85	1.13	0.08	0.07	0.10	0.08
10.	Paper goods	9	8	8	12	3.91	2.59	3.47	4.15	0.73	0.55	0.27	0.21
	Sulfate chemical woodpulp					2.53	1.79	2.45	2.99	–	–	–	–
11.	Textiles	22	12	14	9	1.15	1.00	0.65	0.77	1.01	0.88	0.49	0.48
12.	Footwear and headwear	6	6	4	1	2.67	1.62	0.76	0.08	0.03	0.02	0.05	0.51

Table 6 (continued)

Section		Number of HS4 (6-digit) with RCA > 1				Share in total exports (%)—HS4 (6-digit) with RCA > 1				Share in total exports (%)—HS4 (6-digit) with RCA ≤ 1			
		1999	2005	2010	2015	1999	2005	2010	2015	1999	2005	2010	2015
13	Stone and glass	15	13	7	8	1.08	1.12	0.59	0.78	0.40	0.30	0.26	0.24
14	Precious metals	4	3	3	1	1.56	0.12	0.11	0.09	0.17	0.74	1.12	1.45
15	Metals	41	43	23	28	9.95	10.05	5.11	5.37	1.72	1.71	2.45	2.43
	Raw aluminium					2.48	1.46	0.71	0.33	–	–	–	–
	Semi-finished iron					2.16	1.62	1.19	1.35	–	–	–	–
16.	Machines	21	24	15	11	6.17	8.63	3.25	3.36	6.04	4.43	4.86	4.56
17.	Transportation	32	12	10	8	8.15	6.99	4.68	5.31	3.05	6.08	4.39	3.38
	Cars					–	–	–	–	2.28	3.70	2.25	1.73
	Planes, helicopters and spacecraft					3.68	2.82	2.43	2.29	–	–	–	–
	Vehicle parts					2.47	–	–	–	–	2.03	1.66	1.18
18.	Instruments	2	1	1	0	0.35	0.04	0.04	0.00	0.58	0.43	0.38	0.47
19.	Weapons	2	3	3	4	0.14	0.14	0.18	0.29	0.05	0.00	0.01	0.00
20.	Miscellaneous	3	3	1	1	0.75	0.70	0.03	0.05	0.30	0.33	0.51	0.48

Authors' elaboration

Table 7 Brazil: RCA index based on value added. Source: OECD's Trade in Value Added Database. Available at: https://stats.oecd.org

Sector	1999	2005	2010	2015
01–03	2.60	3.36	3.18	3.93
05–09	0.59	0.82	1.18	0.91
05–06	–	0.55	0.60	0.56
07–08	–	2.74	3.98	2.67
09	–	0.23	0.46	0.56
10–33	0.93	1.07	0.82	0.74
10–12	2.33	2.15	2.28	1.88
13–15	1.16	1.05	0.61	0.47
16	2.84	2.05	1.35	1.31
17–18	1.10	1.40	1.69	1.89
19	1.61	1.92	0.89	1.06
20–21	0.92	1.08	0.67	0.68
22	0.71	0.93	0.92	0.74
23	1.06	0.93	1.01	0.92
24	1.50	1.66	0.98	1.25
25	0.79	0.83	0.69	0.59
26	0.22	0.29	0.11	0.06
27	0.67	0.56	0.38	0.31
28	0.63	0.71	0.58	0.52
29	0.47	1.14	1.04	0.56
30	0.88	1.20	0.61	0.66
31–33	1.01	0.78	1.02	0.89

Authors' elaboration

RCA indexes were calculated using TiVA's indicator on Domestic Value Added Embodied in Foreign Final Demand

The inability of the country to expand exports of more sophisticated products is evident in Fig. 1, which shows how Brazil have navigated within the product space[18] between 1999 and 2015. The products in which Brazil has a comparative advantage are displayed in coloured balls (the size of the ball reflects the importance of the product in the country's export structure, while the colour relates to the type of the product). It is rather clear that the main products exported by Brazil are in the periphery of the product space. They are

[18] The product space is an interesting framework put forward by Hidalgo et al. (2007). Based on network techniques, it displays the relatedness between products in international trade. Related products are those that tend to be exported (with RCA) by the same group of countries. In theory, if a country exports a product *i* it is more likely to export a related product *j*—which is close to *i* within the product space – than a non-related product *k* – which is distant from *i*. Although their method is agnostic in relation to causes, we acknowledge that relatedness is likely to be associated to factor endowments as well as institutional factors.

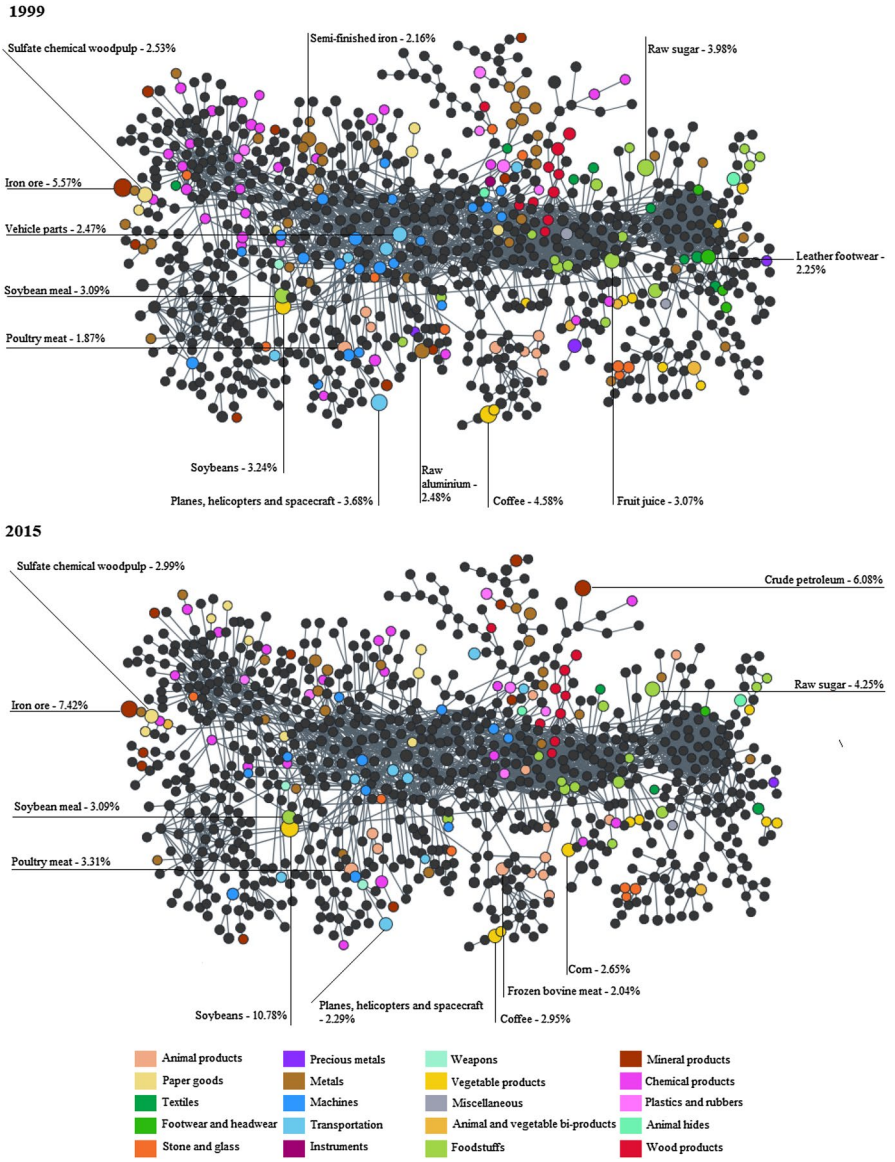

Fig. 1 Brazil: The evolution of exports within the product space. Source: The Observatory of Economic Complexity. Available at: https://oec.world/en. Author's elaboration

weakly connected with other products, what means that being specialized in these products creates few opportunities to competitively produce other goods, as the capabilities required to produce primary goods are quite different from the capabilities required to produce most manufactured goods, particularly the

Table 8 Mexico: the evolution of economic structure and input–output relations. Source: OECDStat, National Accounts and Input–Output Tables (IOTs 2018). Available at: https://stats.oecd.org/

Sector	Sector share in VA (% of Total)				Sector VA real growth (%)			Sector's domestic demand of inputs—real growth (%)	
	2000	2005	2010	2015	2000–2005	2005–10	2010–15	2005–10	2010–15
01–03	3.49	3.21	3.36	3.39	6.91	11.08	10.86	– 10.12	7.87
05–06	5.86	6.61	5.94	2.66	8.63	– 18.22	– 11.21	– 15.93	– 5.82
07–08	0.53	0.69	0.94	0.99	19.04	9.88	35.38	– 23.84	5.88
9	0.30	0.44	0.62	0.54	36.87	50.63	– 2.85	17.08	– 5.54
10–12	4.24	4.41	4.56	4.73	13.11	7.23	10.42	7.36	10.54
13–15	1.47	0.97	0.81	0.80	– 20.88	– 5.06	3.49	– 21.87	– 14.79
16	0.26	0.18	0.15	0.16	– 21.98	– 7.49	16.00	– 19.76	4.58
17–18	0.46	0.41	0.42	0.42	0.65	14.32	9.47	0.84	– 5.21
19	0.66	0.19	0.63	0.72	5.46	– 8.68	– 10.69	– 9.42	– 17.51
20–21	1.75	1.70	1.76	1.54	6.89	2.76	– 4.99	– 34.52	– 6.36
22	0.55	0.48	0.46	0.54	2.41	6.37	14.52	– 6.79	5.35
23	0.75	0.60	0.48	0.48	2.67	– 6.79	10.24	– 27.74	1.06
24	1.01	1.23	1.26	1.04	5.91	– 15.95	3.64	– 4.18	– 4.12
25	0.61	0.57	0.57	0.64	0.51	6.24	6.86	– 5.28	3.99
26	3.63	1.83	1.21	1.65	– 33.16	– 16.81	37.41	– 12.32	– 33.68
27	0.71	0.59	0.56	0.60	– 7.53	– 10.19	7.89	– 12.58	– 20.53
28	0.60	0.62	0.68	0.77	20.04	7.40	6.09	3.07	1.76
29	2.35	1.89	2.07	3.30	– 0.40	21.65	56.33	8.60	35.82
30	0.15	0.15	0.12	0.31	10.58	– 9.62	174.38	– 22.38	134.72
31–33	0.86	0.69	0.58	0.61	0.54	– 0.76	10.57	– 17.89	11.18
35–39	1.72	2.02	1.92	1.69	29.97	25.53	19.03	– 25.15	– 14.21
41–43	7.56	7.99	8.00	7.63	3.07	10.12	9.56	– 4.71	– 15.94
45–47	17.49	16.77	16.68	19.18	11.60	6.67	23.29	– 2.41	20.20
49–53	6.67	6.34	6.49	6.79	5.16	8.00	19.66	– 48.44	– 4.65
55–56	2.98	2.72	2.21	2.37	– 4.26	– 5.43	17.50	– 18.15	15.76
58–60	0.35	0.37	0.40	0.42	– 1.51	16.61	24.21	8.96	9.81
61	1.33	1.78	2.02	1.47	99.73	62.36	63.82	15.33	11.01
62–63	0.12	0.13	0.11	0.10	1.25	12.54	4.17	1.87	3.84
64–66	1.90	3.18	3.54	3.69	30.35	90.42	69.58	44.40	36.49
68	12.03	12.14	12.05	11.15	16.78	15.75	11.04	14.10	4.55
69–82	6.51	6.97	6.53	6.63	9.46	6.62	16.37	– 4.84	9.09
84	3.54	3.81	4.36	4.27	– 4.74	12.21	8.29	10.36	14.72
85	3.45	4.04	4.17	4.34	8.56	3.43	3.99	– 0.92	11.10
86–88	1.86	2.09	2.26	2.42	– 1.81	13.74	4.08	3.20	24.13
90–96	1.78	1.70	1.59	1.46	2.36	4.96	6.75	– 6.96	3.75
97–98	0.48	0.48	0.49	0.50	10.05	12.91	18.23	–	–
Total economy	100	100	100	100	7.26	7.53	15.52	–	–

Table 8 (continued)

Authors' elaboration

Sectoral value added deflators were used to deflate sectoral output

more technologically sophisticated ones. This is typical of countries that are specialized in the production of primary products, which usually takes part of the initial stages of GVCs. It is important to note that the backbone of the product space, populated by the highly connected products, is scarcely populated by coloured balls. Worse, the number of such balls diminishes over time, and their sizes reduce. This means that Brazil not only lost the opportunity of using existing capabilities to expand production and exports to nearby products (in the product space) but indeed witnessed RCA vanishing in products such as vehicle parts. The isolationist trade policy followed by Brazil over this period certainly contributed to keep the country off the GVCs, except for its role as supplier of natural resource intensive goods.

4.3.3 Mexico: the co-evolution between FDI and production structure

The Mexican economy has historically been more dependent upon the mineral extractive sector than the Brazilian economy. As shown in Table 8, in 2000 the oil and gas extractive industry accounted for almost 6% of value added in Mexico, whilst in Brazil its contribution was a mere 1%. However, contrary to Brazil, Mexico witnessed a substantial reduction in this sector's weight in the country's economy. During the boom years of the commodities super cycle, the oil and gas share in value added went up, despite the substantial reduction in this sector's output in the period 2005–2010. Such descending trend continued in the following five years, but this time it was accompanied by plummeting prices. As a result, the sector's share in value added dropped to less than half of the 2010 figure.

For several decades, a Mexican state-owned company had a monopoly in the exploitation and production of hydrocarbons. However, differently from Brazil, where monopoly was withdrawn before the discovery of overwhelming new reserves, the monopoly was broken as late as 2014, long after Mexico's peak in production and proven reserves. Thus, even considering that FDI directed to the Mexican oil sector soared from 2015 onwards (from very low levels) the impact on the domestic economy tends to be less relevant than in Brazil, where the attractiveness of the sector increased substantially after the discovery of the large reserves in the pre-salt layer.

Mexico underwent a period of deindustrialization, though less pronounced than in Brazil. The performance of manufacturing subsectors, however, were quite disparate. Labour-intensive activities suffered the most in the period 2000–2010, when the world was flooded by low-cost goods made in China. Even the car industry, one of the champions of the NAFTA-driven *maquila* fever, declined in the first half of the 2000s. Nonetheless, a different scenario emerged in the period 2010–2015. The manufacturing sector regained part of its previous share in GDP,

with some industries, such as computers, electronics and optical products as well as automobiles and auto components presenting impressive output growth. These industries were among the largest recipients of FDI in Mexico's manufacturing sector in the period under analysis. However, the development impact of those industries, in terms of the linkages with the rest of the domestic economy, seems to have been quite different. As shown in Tables 8 and 9, the computer, electronics and optical products industry may be called the quintessential *maquila* because even when output grew substantially (2010–2015),[19] demand for domestic inputs dropped, while the use of imported inputs went up—the ratio of imported inputs to domestic inputs jumped from 0.81 to 1.77 between 2005 and 2015. In the car industry (Table 8), purchases from the domestic producers expanded, but the purchase of inputs did not keep the pace of the industry itself. As a result, the share of imported inputs rose, particularly in the period 2010–2015.

Infrastructure sectors grew considerably faster than the rest of the Mexican economy, but such improved performance was not mirrored in their share in the country's total value added due to declining relative prices. However, unlike Brazil, where the presence of foreign MNEs in both energy and telecommunications was pervasive, FDI was not a key driver of output growth in Mexico.

On the other hand, FDI in the financial sector was quite important in Mexico, in contrast to Brazil. After the 1994 Tequila crisis, which spread to other Latin American economies, both countries heartly welcomed foreign banks, which acquired several bankrupt domestic banks. However, the result came to be rather different. In Brazil, HSBC and Citigroup left the retail banking market after some years struggling to compete with the largest domestic banks. In contrast, the three largest banks in Mexico by the end of 2015 were BBVA, Santander, and Banamex, a subsidiary of Citigroup. The fifth and the sixth largest were HSBC and the Scotiabank, also foreign controlled. From 2001 to 2015, credit to the private sector (as a share of GDP) grew from 12.9 to 31.9%, a movement reflected in the financial sector's share in the economy's total value added. Nonetheless, despite such growth, credit depth remained very low in Mexico—in Brazil that ratio reached 66.8% in 2015. The overwhelming presence of foreign actors in such a vital sector of a modern capitalist economy was widely criticised. Serrano (2016), for example, argued that foreign

[19] During the 1980s, Brazil and Mexico adopted rather similar policies in respect to the ICT industry. Both protected domestic producers against foreign competition and imposed minimum local content requirements. Protectionism was abandoned in the 1990s, but the countries followed quite different approaches since then. Brazil prioritized the domestic market, gave no attention to integration to GVCs and maintained active industrial policy for the industry. Not surprisingly, therefore, Brazil was able to retain in the country a larger share of input purchases. Mexico, in turn, invested in greater openness and export orientation of the industry. Vertical industrial policy was practically abolished since the signing of NAFTA, even though the ICT industry has disproportionately benefited from horizontal policies aimed at fostering innovation and R&D in the whole economy. It must be noted, however, that State-level incentives to attract FDI remained in place. The State of Jalisco, for example, was able to attract major MNE plants focused on electronics export markets. According to Schatan and Enríquez (2015), over time, production in Jalisco evolved from large volumes and low value added to smaller-scale production with higher value added locally – what can be interpreted as an upgrading from pure *maquila* to a more knowledge and technology intensive stage.

Table 9 Mexico: decomposition of the output (%). Source: OECD's Input Output Tables (IOTs). Available at: https://stats.oecd.org/

Sector	Domestic inputs			Foreign inputs			Value added		
	2005	2010	2015	2005	2010	2015	2005	2010	2015
01–03	29.82	29.81	29.67	5.26	5.92	6.73	64.41	63.75	63.00
05–06	9.16	9.21	15.45	0.98	0.98	2.61	89.67	89.62	81.51
07–08	33.85	27.60	25.98	6.34	5.75	7.59	58.89	65.75	65.29
9	41.77	40.63	38.47	4.76	4.62	7.32	52.46	53.78	52.90
10–12	53.68	53.69	52.86	7.61	8.07	8.55	38.36	38.03	38.23
13–15	45.88	44.26	38.30	19.92	18.78	21.26	32.96	35.92	38.62
16	52.22	51.49	47.70	10.90	10.87	12.44	36.45	37.14	39.25
17–18	58.10	56.38	52.32	16.05	17.31	19.06	25.31	25.75	27.83
19	89.29	78.02	66.44	3.88	7.99	11.32	4.46	11.20	18.51
20–21	59.83	52.62	49.85	15.54	17.65	20.83	23.57	28.58	27.89
22	53.15	50.74	45.11	19.43	22.08	25.24	26.80	26.54	28.72
23	59.86	58.50	55.25	9.79	12.21	14.52	29.45	28.11	28.81
24	52.22	53.86	52.57	13.50	14.34	15.98	33.43	30.84	30.22
25	53.29	52.29	46.97	17.93	19.72	24.20	28.03	27.19	27.69
26	43.66	38.09	27.04	35.34	45.63	47.79	19.67	14.51	22.50
27	48.36	44.80	34.74	28.21	32.04	38.00	22.40	21.93	25.32
28	41.60	40.36	33.59	21.61	22.40	28.91	36.00	36.40	36.18
29	47.84	46.64	39.23	28.16	29.15	33.19	22.59	22.71	23.81
30	45.58	45.43	39.34	18.71	20.50	26.35	34.83	33.07	32.77
31–33	49.68	48.64	45.52	16.78	17.92	21.88	32.79	32.62	31.34
35–39	37.90	35.67	30.29	3.95	5.45	7.31	57.12	57.74	61.01
41–43	35.07	34.73	29.50	8.44	9.24	11.39	55.91	55.34	58.20
45–47	17.84	17.55	16.68	2.23	2.38	2.13	79.55	79.70	80.73
49–53	32.31	30.44	28.91	6.07	7.73	9.25	59.87	59.86	59.19
55–56	30.64	30.10	28.86	2.92	3.24	3.82	65.67	66.02	66.40
58–60	49.99	48.38	46.35	7.25	7.40	7.54	42.33	43.77	45.47
61	27.61	25.21	27.10	6.39	5.88	7.71	65.59	68.52	64.49
62–63	45.29	44.93	43.03	7.11	8.75	9.73	47.01	45.69	46.33
64–66	31.21	32.31	32.43	2.60	2.65	3.20	65.98	64.78	63.97
68	9.66	9.54	8.71	0.66	0.76	1.17	89.61	89.61	90.00
69–82	20.95	20.42	19.51	2.17	2.38	2.67	76.68	76.97	77.51
84	24.02	24.05	24.22	3.56	4.45	6.80	71.97	70.95	68.09
85	10.08	9.52	8.97	1.09	1.34	1.75	88.71	89.01	89.08
86–88	29.12	27.55	27.99	4.68	5.05	6.72	65.79	66.97	64.64
90–96	23.71	23.46	23.05	3.61	3.86	4.67	72.32	72.30	71.73
97–98	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00

Authors' elaboration

The difference between output and the components above is comprised by taxes and subsidies

banks in Mexico were excessively risk-averse, as demonstrated by the low level of non-performing loans. Vidal et al. (2011), assign Mexico's slow recovery from the 2008 global financial crisis to the dominance of foreign banks and the minimal presence of state-owned banks that could have carried out counter-cyclical policies.

A few studies have investigated the relationship between FDI and manufacturing performance in Mexico, with a special focus on the effects of NAFTA. In this respect, Grumiller (2014) identifies a considerable gap between the *ex-ante* projections and the *ex-post* evaluations of the effects of NAFTA on Mexican economy. Computable general equilibrium simulations that assumed substantial increases in greenfield FDI flows—and the correspondent rise in capital stock –have overestimated employment and wage gains in Mexico. Using highly disaggregated (4-digit) manufacturing data, Nunnenkamp and Bremont (2007) found a small positive impact of FDI on manufacturing employment in Mexico over the period 1994–2003. According to their estimates, the employment impact of FDI diminishes (or becomes more negative) the more skill-intensive the industry becomes, a result driven by blue-collar employment. White-collar employment tends to grow in response to FDI as an industry becomes more skill-intensive. Using industry-level data, Waldkirch (2010) finds a positive relationship between FDI and total factor productivity (TFP) after NAFTA, but the effect on workers' compensation was zero (or even negative). More important, the positive effect is restricted to non-*maquila* FDI—increases in *maquila* FDI does not seem to increase TFP.

4.3.4 Mexico: the co-evolution between FDI and export structure

Unlike Brazil, where key export products are produced primarily by domestic firms, in Mexico exporting is associated with MNE activity, which, in turn, is associated with the *Maquila* System, which accounts for a substantial part of the country's manufacture exports, especially for the US market.[20]

Mexico's export processing firms –*maquiladoras* or *maquilas*—form one of the oldest international production networks in the world[21] (Hansen, 2003). These

[20] Until 2006, Mexico's National Institute of Statistics (INEGI) used to collect and publish data of the *Maquila* System separately from the rest of the manufacturing sector. In that year, the *Maquila* program was merged with another program that concede benefits to exporters (PITEX), and from that date it became impossible to distinguish the *maquilas* from other export plants in published statistics. According to Koopman et al. (2013), in 2006 there were 2795 plants under the *maquila* regime and 3620 under the PITEX. Together, these plants were responsible for 85.4% of the country's total exports and 52.7% of total imports. *Maquilas* were predominant in computer and electronics (84.9% of the exports), while PITEX were predominant in transport equipment (62.5% of the exports).

[21] The origins of the *maquilas* date back to the late 1960s, when Mexican government instituted the (Northern) Border Industrialization Program (Hansen, 2003). The introduction of assembly plants was viewed as a way of fighting the high unemployment rates that prevailed in border cities. The program was inspired by the export processing zones that were been erected in Asia and allowed the import of raw materials, components, and capital goods duty free if the production was totally exported. Originally the companies involved in *maquila* scheme could not be controlled by foreign investors, but this restriction was lifted in 1973. With the program, US FDI in Mexico shifted from oil sector to these assembling industrial plants. Nonetheless, the *maquila* sector only took off after the 1982 foreign debt crisis. Besides the competitiveness brought by currency devaluation, the government lifted many of the restrictions that hampered the attractiveness of the *maquilas*.

firms import parts and components, which are assembled into final products that are later exported, mainly to the US market, which is also the main source of inputs. They are more active in electronics, automotive and garment industries (Hanson, 2002). Until 1994, when NAFTA was put in place, the *maquilas* benefited from the US offshore assembly program, which permitted the duty-free return of domestically manufactured components that had been processed in another country—importers had to pay import tariffs only on the value added abroad (Hanson, 2002). This program, on the one hand, reduced the cost of moving assembly activities abroad for US MNEs, but, on the other hand, prevented the creation of linkages within Mexico's domestic economy as the inputs sourced locally had to pay import duties. Such distortion was eliminated by NAFTA.

Before its implementation, there was an expectation that NAFTA would curb the *maquilas* advantages, but they were able of remaining competitive because of wage differentials. Output and employment within *maquila* sector expanded fast during the 1990s, especially in the electronics and automotive industries. NAFTA strengthened the regional value chains because it imposed an advantage for regionally sourced inputs, *vis-à-vis* non-NAFTA inputs, which had to pay import tariffs. NAFTA's rules of origin also created an incentive for higher value adding in Mexico in order to export to the US market without tariffs. This incentive was reflected on domestic content of exports which, between 1995 and 2001, rose from 11 to 18% in the electronics, and from 15 to 24%, in the automotive *maquilas* (Castillo & De Vries, 2018).

Nonetheless, the scenario changed after China's accession to WTO (Gallagher & Porzecanski, 2007). Besides being the main destinations of US MNE manufacturing offshoring, China's and Mexico's export baskets to the US were quite similar, with the predominance of products made in export processing zones using inputs imported from elsewhere. With China's emergence, Mexico lost one of its sources of competitive advantage—low labour costs. Nearly a quarter of the jobs in the electronics *maquilas* were lost between 2000 and 2005, while in auto parts there was a small growth in employment (Sargent & Matthews, 2008). Sargent and Matthews (2004) argue that this was partly due to relocation of export processing plants to China in the case of goods in which proximity to the US market was not a key competitive advantage.[22] In a study using plant level data for the period 1990–2006, Utar and Ruiz (2013) find that a higher penetration of Chinese products in the US market is associated with a decrease in employment and in sales at Mexican *maquilas*. Plant growth and survival are also negatively affected by Chinese competition. Even considering that Mexico's exports to US did not fall in absolute terms, the country lost market share in favour of China in products like consumer electronics and appliances and computers. With China's

[22] According to their definition, non-proximity dependent products are typically high volume, highly standardized, not part of just-in-time processes, with low transportation costs relative to total costs (Sargent & Matthews, 2004, 2008).

Table 10 Mexico: the evolution of export structure and RCA—1999/2015. Source: The Observatory of Economic Complexity. Available at: https://oec.world/en

Section		Number of HS4 (6-digit) with RCA > 1				Share in total exports (%)—HS4 (6-digit) with RCA > 1				Share in total exports (%)- HS4 (6-digit) with RCA ≤ 1			
		1999	2005	2010	2015	1999	2005	2010	2015	1999	2005	2010	2015
1.	Animal products	4	3	3	4	0.58	0.43	0.22	0.46	0.30	0.30	0.47	0.44
2.	Vegetable products	19	22	20	19	2.44	2.19	2.32	2.71	0.42	0.31	0.48	0.60
3.	Animal and vegetable bi-products	1	1	1	0	0.00	0.00	0.00	0.00	0.05	0.04	0.05	0.05
4.	Foodstuffs	8	11	13	12	1.12	1.61	2.15	2.14	0.87	0.72	0.58	0.73
5.	Mineral products	13	8	9	12	6.88	13.91	12.05	6.07	0.75	1.82	2.15	1.03
	Crude petroleum					6.45	13.45	11.58	4.99	–	–	–	–
6.	Chemical products	20	23	22	19	1.03	1.04	1.18	0.91	2.18	1.99	2.01	1.98
7.	Plastics and rubbers	6	8	8	11	1.07	1.26	0.73	1.54	1.18	1.28	1.75	1.24
8.	Animal hides	6	5	3	4	0.06	0.06	0.03	0.03	0.28	0.12	0.12	0.14
9.	Wood products	3	2	0	1	0.20	0.07	0.00	0.01	0.19	0.11	0.10	0.10
10.	Paper goods	6	5	5	5	0.36	0.37	0.26	0.36	0.45	0.47	0.41	0.32
11.	Textiles	37	28	15	8	6.09	3.06	1.12	0.66	1.36	1.35	1.00	1.11
12.	Footwear and headwear	4	2	2	2	0.05	0.01	0.01	0.01	0.32	0.16	0.15	0.18
13.	Stone and glass	16	20	15	12	0.92	1.04	0.80	0.71	0.40	0.16	0.16	0.28
14.	Precious metals	3	2	3	2	0.35	0.34	2.80	0.49	0.30	0.46	0.27	1.22
15.	Metals	31	32	28	23	2.39	3.55	2.40	1.87	2.12	1.63	2.25	1.99
16.	Machines	41	45	47	44	33.15	32.30	33.00	32.30	7.29	4.85	4.16	4.68
	Computers					4.74	4.07	3.60	5.15	–	–	–	–
	Electrical transformers					1.65	0.92	0.73	0.73	–	–	–	–
	Insulated wire					4.51	3.46	2.30	3.01	–	–	–	–
	Integrated circuits					–	–	–	–	1.17	0.52	0.34	0.46
	Low-voltage protection equipment					1.73	1.43	1.03	0.91	–	–	–	–

Table 10 (continued)

Section		Number of HS4 (6-digit) with RCA > 1				Share in total exports (%)—HS4 (6-digit) with RCA > 1				Share in total exports (%)- HS4 (6-digit) with RCA ≤ 1			
		1999	2005	2010	2015	1999	2005	2010	2015	1999	2005	2010	2015
	Office machine parts					–	–	–	–	2.26	1.07	0.21	0.24
	Telephones					1.40	1.51	3.06	3.90	–	–	–	–
	Video displays					3.84	4.95	6.65	4.17	–	–	–	–
17.	Transportation	12	7	9	8	17.94	15.30	17.90	24.90	0.45	0.35	0.44	0.50
	Cars					9.28	6.36	7.93	8.90	–	–	–	–
	Delivery trucks					3.21	3.49	3.81	5.82	–	–	–	–
	Vehicle parts					3.51	4.49	4.64	6.59	–	–	–	–
18.	Instruments	12	14	13	13	2.30	3.28	3.21	4.23	0.81	0.64	0.70	0.63
	Medical instruments					0.65	1.57	1.76	2.13	–	–	–	–
19.	Weapons	0	0	0	0	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
20.	Miscellaneous	11	11	9	10	2.37	2.70	1.90	2.82	0.97	0.70	0.68	0.56

Authors' elaboration

entry in the WTO, proximity to US remained the main, if not the only, competitive advantage of Mexican *maquilas* (Sargent & Matthews, 2008).

Despite its importance for balance of payments and job creation, the *maquila* system has been, since its inception, questioned as a strategy of economic development. Linkages between the export processing plants and the domestic firms remained very limited—the domestic value added in *maquilas*' exports fell from 27% in 1981 to 13% in 2006 (Castillo and De Vries (2018). According to Koopman et al. (2013), in 2003 maquilas accounted for 85% of Mexico's exports of computers and electronics, but domestic value added was mere 14% (8.5% in the case of computers). Thus, differently from some Asian economies whose development strategies also relied upon export processing zones—Taiwan, South Korea and, more recently, China—Mexico has not been able to upgrade significantly within GVCs.

Table 10 lists the products exported by Mexico in which it has a revealed comparative advantage. The contrast with Brazil is evident. Except for crude petroleum, which was impacted by the booming prices of the commodities super cycle, natural resource-based goods are almost irrelevant within Mexico's export basket over the whole period analysed. Mexico's comparative advantages are not only localized in manufacturing but are concentrated in two specific areas: electronics and transport equipment. The latter is usually classified as a medium technology industry while the former is commonly classified as high tech.

Over the period 1999–2015, Mexico's comparative advantages seem to have been concentrated in a decreasing number of products. From Table 10, it is clear that Mexico almost completely lost its former competitiveness in textiles. Indeed, the number of 6-digit categories in which the country has revealed advantage decreased from 37 to 8 between 1999 and 2015 (see also Fig. 2, which displays the evolution of country's exports within the product space). In turn, transport equipment became more relevant within the country's export basket, especially auto parts and trucks. Over the whole period, electro-electronic goods remained as the main category within Mexico's export basket, but significant shifts have taken place. Computers increased in importance, while components such as integrated circuits or office machine parts have reduced in importance. An inverted-U shaped trend can be noted in video displays, a product that became very important in Mexico's export basket *circa* 2010, having lost prominence since then. In turn, telephones, which were not so important in 1999, augmented its relevance over time, becoming one of the leading export products in 2015. To conclude, it is noteworthy the increase in importance of medical instruments over the period.

Nonetheless, given the widely known high import content of Mexico's exports, analysis of RCA based on gross exports can be misleading. Thus, it is important to resort to RCA based on value added in order to have a more trustworthy picture of the country's place in the world's international division of labour. Table 11 confirms Mexico's RCA in computers, electronics, and automotive products, suggesting that such advantages have been increasing over time. According to these numbers, in 2015 the greatest specialization of the country was in transport

equipment, followed by electronics (computers), an industry in which the country did not present RCA in 1999.

As shown in Fig. 2, Mexico specialized in highly connected goods. According to the Economic Complexity literature, this means that there is a considerable potential for expanding exports to 'nearby' products (within the product space) as they are likely to require the same capabilities as those that Mexican firms already produce. This is the path that economies like South Korea and Taiwan followed since the 1960s, moving within the product space while also upgrading to higher value-added products. This has not yet been the case for Mexico.

In sum, Mexico's post-1982 development strategy has given manufacturing exports a central role. It was expected that liberal reforms would improve efficiency and help the country to attain higher GDP growth rates. While gross exports increased substantially, we have not seen a commensurate increase in GDP growth. The high use of imported inputs coupled with low integration of the *maquilas* with domestic producers has limited the multiplier effects coming from foreign demand. Linkages between the export-oriented plants and the domestic-oriented economy also remain scarce. For this reason, the export-oriented manufacturing sector is unable to work—borrowing from Kaldor's (1967) terminology—as a growth engine for the rest of the economy.

The emergence of China has been a great challenge to Mexico because of their similar specializations. China's share in US imports of manufactures rose sharply in the 2000s, while Mexico's share, after a surge in the 1990s, declined. The inflection point for both countries occurred in 2001, the year China joined the WTO (Hanson, 2010). Following WTO accession and the end of the Multi-Fibre agreement in 2005, China quickly displaced Mexico and other Latin American countries from the US apparel market. Mexico also lost comparative advantage *vis-à-vis* China in computers and electronics but maintained it in automobiles and auto parts (Chiquiar & Ramos-Francia, 2009).

The emulation of East Asian style of export-led industrialization by Mexico has not led to similar outcomes. Taiwan also started its industrialization following a model quite similar to the *maquila* system, but its firms were able to graduate and develop own-brand production. Mexico has not made such a transition, remaining locked-in to labour-intensive processing of imported inputs, and have augmented the country's exposure to Chinese competition (Hanson, 2010). Among the possible explanations for Mexico's inability to upgrade in the electronics industry is the physical distance separating the *maquilas* from the country's major industrial and technological hubs, such as Mexico City and Guadalajara, what may have prevented the development of backward linkages (Lowe & Kenney, 1999). In turn, agglomeration near the US border was not sufficient to engender the positive externalities usually associated with industrial clusters.

Another possible reason for Mexico's failure to upgrade may be its passive approach to industrial policy. Unlike Brazil, which despite the abandonment of ISI model, maintained and strengthened specific industrial policies, Mexico

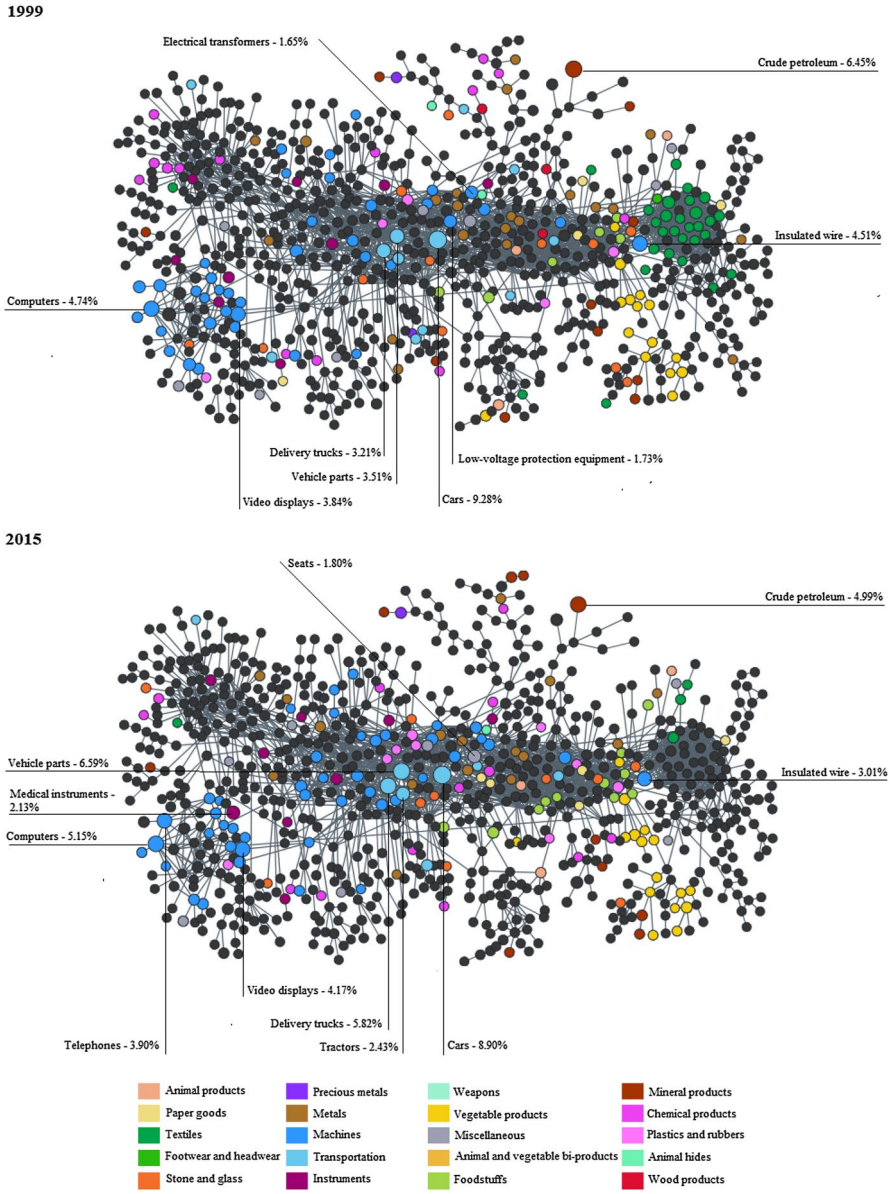

Fig. 2 Mexico: The evolution of exports within the product space

progressively forsook active industrial policy, culminating in its virtual disappearance after signing NAFTA.[23] Since then, industrialization has been promoted

[23] According to Calderón and Sánchez (2012), a few programs were created or maintained in the 1980s but were underfunded and hampered by the liberal macroeconomic policy.

Table 11 Mexico: RCA index based on value added. Source: OECD's Trade in Value Added Database. Available at: https://stats.oecd.org

Sector	1999	2005	2010	2015
01–03	1.01	0.77	0.81	0.96
05–09	1.86	1.90	1.57	1.04
05–06	–	2.12	1.73	0.92
07–08	–	0.83	0.95	1.51
09	–	1.20	1.25	1.28
10–33	0.61	0.81	0.88	1.10
10–12	0.63	0.69	0.88	0.95
13–15	1.87	0.92	0.58	0.58
16	1.22	0.41	0.41	0.55
17–18	0.77	0.32	0.44	0.50
19	0.49	0.30	0.60	0.58
20–21	1.98	0.47	0.50	0.43
22	1.19	0.59	0.67	0.91
23	1.41	0.81	0.70	0.81
24	1.41	1.14	1.53	1.30
25	0.41	0.55	0.61	0.72
26	0.64	1.18	1.13	1.53
27	3.46	1.23	1.19	1.41
28	1.21	0.47	0.52	0.66
29	1.46	1.62	2.24	3.41
30	0.12	0.21	0.14	0.41
31–33	2.60	0.86	0.77	0.81

Authors' elaboration

RCA indexes were calculated using TiVA's indicator on Domestic Value Added Embodied in Foreign Final Demand

via trade openness, trade deals and horizontal policies aimed at improving the business environment (Calderón & Sánchez, 2012).[24] Indeed, despite the habitual rhetoric supporting industrial policy, successive governments have taken the view that it must not distort markets, limiting interventions to correct market failures (Moreno-Brid, 2016). With this narrow approach, the government has missed the opportunity of putting in place policies aimed at upgrading within industries in which Mexico already has a comparative advantage (Moreno-Brid, 2016).

[24] It must be recognized, however, that despite the inexistence of comprehensive industrial policies, specific industries and firms, particularly foreign MNEs, benefit from incentives offered by governments, especially at the subnational level (Calderón & Sánchez, 2012). According to Moreno-Brid et al. (2020), industrial policies at subnational level have been crucial for the creation of new high-tech export oriented industrial complexes such as in the State of Jalisco.

5 Concluding remarks

As we have emphasised earlier, there are methodological challenges in comparing the experiences of two very different economies, with heterogeneous endowments, histories and political economies, as our analyses and discussion illustrates. We have opted to conduct a temporal description of the evolution of exports, FDI and economic structure over time, from which certain parallels can be highlighted. Identifying causal relations through more rigorous statistical means would have been preferable to the simple detection of co-movements between variables, as indeed would a comparison of data across a larger set of countries. Nonetheless, we feel that our analysis is indicative of important trends that are implied through the observation of contemporaneous movements in these key variables and offer important insights for policy makers.

Industrialization through import substitution in Latin America has a long and complex history, which has received considerable attention in a wide literature, in many cases contrasting it with the East Asian experiences (see Cárdenas et al., 2000; Gereffi & Wyman, 1990; Lall, 1996; Fishwick, 2019). Both groups of countries have fundamentally different structures, varying comparative advantages, different political economies, and positioned differently within twenty-first century geopolitics. Both groups of countries followed different development paths within ISI, and within that, the role of the MNE was also fundamentally different.

Where social movements and the political will of workers and unions was stronger, ISI was primarily a means to promote development, and MNE engagement was a means to that end, with a view to reduce imports, and protect domestic incumbents in existing sectors. Where states did not rely on grassroots support, they did not always share surpluses from early industrialization with the workers, but with domestic industrialists, and were able to prioritise longer term goals, such as the competitiveness of nascent and newer sectors through export performance requirements. Whether autocratic or democratic, states have obligations to one of two domestic groups to maintain political power: Surpluses from ISI programmes had to enhance either the welfare of the elites (industrialists, landowners, military), or that of the working classes (represented in some cases by unions). States decide to enforce an industrial policy to build up specific industries, and the degree to which ISI co-opted or excluded domestic industrialists.

The devil is in the detail: at a superficial level, Brazil and Mexico followed similar trajectories in terms of policy, not just during the ISI era, but also during the liberalization era. What our analysis highlights is that these two countries picked very different strategies moving forward. The imperatives of the two varied considerably, in part reflecting the relationship of Mexico to the US, both in terms of physical proximity and political dependence, which combined made the US Mexico's largest trading and investment partner. Brazil, while still within the US' sphere of influence, had considerably more flexibility and independence in its economic policies.

The differentiation is also obvious in the liberalization of the world economy that followed in the wake of the Washington Consensus in the 1990s, with Mexico following a more orthodox path (i.e., closer to the Washington Consensus) than Brazil.

Associated restrictions introduced within the WTO agreements saw a greater dismantling of ISI policies in Mexico, and a deepening of the Mexico-US economic dependency. Both Brazil and Mexico downplayed selective industrial policies and focused on horizontal incentives, weakening infant industries that had been in nascent development, such as the computer and consumer electronics industries.

With liberalization, domestic actors were easily acquired by foreign MNEs, and as globalization proceeded at pace during the new century, MNEs rationalized their international operations by closing down and merging activities within regions to create greater intra-MNE efficiency and costs. For the host countries, local demand was met through imports which also saw the demise of many local supply chains. This contributed to a rapid shrinking in the manufacturing sector in both countries, with direct unemployment effects, as well as a reduction in the quality of jobs as most MNEs tended to concentrate their more knowledge intensive activities in appropriately endowed locations.

Despite the rhetoric discounting ISI as a wasteful exercise, ISI was instrumental in transforming the economic structures of a number of Latin American economies away from the primary sector and commodity overdependence and put into place the resources and capabilities from which more knowledge-intensive sectors might grow. This is especially so for the two largest economies of the region whose economic structures shifted inexorably away from a reliance on the primary sector.

As might be expected, Mexico's close interdependence upon the US (and to a lesser degree, Canada) has seen a dismantling of its investment in knowledge infrastructure and on sectoral interventions, and this is reflected in how its economic structure has evolved away from the (truly) dynamic sectors, becoming increasingly, in a Lewisian sense, the US' hinterland, offering an (almost) infinite supply of low cost inputs, locking Mexico into an economic structure that reflects this symbiotic relationship. The expansion of GVCs has seen greater exports of knowledge-intensive goods, but this is something of a mirage, given the high degree of re-exports.

Brazil, on the other hand, has neither regressed back to an overdependence on the primary sector, as other countries in the region have done, nor has it expanded its competitive strengths in manufacturing. Indeed, in many sectors of former strength, it has lost ground (with some notable exceptions). Nonetheless, successive governments have sought to reinforce key sectors, and prioritise new ones, albeit against a somewhat turbulent political background. These changes also reflect domestic political economy tensions that reflect powerful actions by interest groups (industrial and land-owning capitalists, as well as the working classes), and the (sometimes) conflicting interests of these groups. Perhaps most significant (and ominous) development is the growing underinvestment (and policy emphasis) on innovation.

From a conceptual point of view, this is perhaps the first study that tracks the complex intertwining of policies, economic structure, and the intricate patterns of trade and investment flows, in an extended longitudinal perspective. Earlier studies have tried to determine whether changes in domestic economic structures shape the patterns of FDI and trade or vice-versa. This, we have concluded in earlier studies (Pineli et al., 2021; Pineli, 2022), is largely a futile exercise because it tends to overlook the dynamics and the feedback effects among these variables. What the comparison of Mexico and Brazil offers is illustrative of how relatively simple changes

in horizontal policy frameworks towards trade and MNE investment can play a significant role in reshaping the economic structure, as they change the signs and incentives that the economic agents face. It also illustrates that industrial policy—that is vertical selective policy interventions—can matter in fostering domestic linkages and in changing national competitiveness.

Appendix

Sectors
01–03: Agriculture, forestry and fishing
05–06: Mining and extraction of energy producing products
07–08: Mining and quarrying of non-energy producing products
09: Mining support service activities
10–12: Food products, beverages and tobacco
13–15: Textiles, wearing apparel, leather and related products
16: Wood and products of wood and cork
17–18: Paper products and printing
19: Coke and refined petroleum products
20–21: Chemicals and pharmaceutical products
22: Rubber and plastic products
23: Other non-metallic mineral products
24: Basic metals
25: Fabricated metal products
26: Computer, electronic and optical products
27: Electrical equipment
28: Machinery and equipment, nec
29: Motor vehicles, trailers and semi-trailers
30: Other transport equipment
31–33: Other manufacturing; repair and installation of machinery and equipment
35–39: Electricity, gas, water supply, sewerage, waste and remediation services
41–43: Construction
45–47: Wholesale and retail trade; repair of motor vehicles
49–53: Transportation and storage
55–56: Accomodation and food services
58–60: Publishing, audiovisual and broadcasting activities
61: Telecommunications
62–63: IT and other information services
64–66: Financial and insurance activities
68: Real estate activities
69–82: Other business sector services
84: Public admin. and defence; compulsory social security
85: Education
86–88: Human health and social work

Sectors
90–96: Arts, entertainment, recreation and other service activities
97–98: Private households with employed persons

Data availability The data used in this paper are available from the authors upon request.

References

Arbix, G. (2010). Caminhos cruzados: Rumo a uma estratégia de desenvolvimento baseada na inovação. *Novos Estudos CEBRAP, 87*, 13–33.

Balassa, B. (1965). Trade liberalisation and 'revealed comparative advantage.' *The Manchester School, 33*, 99–123.

Bielschowsky, R. (1994). *Two studies on transnational corporations in the Brazilian manufacturing sector: the 1980s and early 1990s*. Cepal/Eclac. Desarollo Productivo n. 18.

Bielschowsky, R. (1999). *Investimentos na indústria brasileira depois da abertura e do real: o mini-ciclo de modernizações, 1995–1997*. Cepal. Serie Reformas Económicas n. 44.

Bielschowsky, R., & Stumpo, G. (1995). Empresas transnacionales y cambios estructurales en la industria de Argentina, Brasil, Chile y México. *Revista De La Cepal, 55*, 139–163.

Bonelli, R. (1980). Concentração industrial no Brasil: Indicadores da evolução recente. *Pesquisa e Planejamento Econômico, 10*(3), 851–884.

Bruton, H. (1989). Import substitution. In H. Chenery & T. Srinivasan (Eds.), *Handbook of development economics* (pp. 1601–1644). Elsevier.

Calderón, C., & Sánchez, I. (2012). Crecimiento económico y política industrial em México. *Problemas Del Desarollo, 170*(43), 125–154.

Cárdenas, E., Ocampo, J., & Thorp, R. (2000). *An economic history of twentieth-century Latin America, volume 3: Industrialization and the State in Latin America: The postwar years*. Palgrave.

Castillo, J., & De Vries, G. (2018). The domestic content of Mexico's maquiladora exports: A long-run perspective. *The Journal of International Trade & Economic Development, 27*(2), 200–219.

Chenery, H. (1960). Patterns of industrial growth. *American Economic Review, 50*(4), 624–654.

Chiquiar, D., & Ramos-Francia, M. (2009) *Competitiveness and growth of the Mexican economy.* Mexico City: Banco de México (Documento de Investigación n. 2009–11).

Clavijo, W., Almeida, E., Losekann, L., & Rodrigues, N. (2019). Impacts of the review of the Brazilian local contente policy on the attractiveness of the oil and gas projects. *Journal of World Energy Law and Business, 12*(5), 449–463.

Colistete, R. (2003). Was import-substituting industrialisation in Brazil a failure? Evidence from the technological structure of exports, 1945–1973. In: Paper presented at the 5th Brazilian Conference on Economic History (V Congresso Brasileiro de História Econômica).

Creel, L., Jr. (1968). "Mexicanization": A case of creeping expropriation. *SMU Law Review, 22*(2), 281–299.

Cuervo-Cazurra, A., Narula, R., & Un, C. (2015). Internationalization motives: Sell more, buy better, upgrade and escape. *Multinational Business Review, 23*(1), 25–35.
De Negri, J. (1999). O custo de bem-estar do regime automotivo brasileiro. *Pesquisa e Planejamento Econômico, 29*(2), 215–242.
Dunning, J. (1981). Explaining the international direct investment position of countries: Towards a dynamic or developmental approach. *Weltwirtschaftliches Archiv, 177*, 30–64.
Dunning, J. (1988). *Explaining international production*. Unwin Hyman.
Dunning, J. (1993). *Multinational enterprises and the global economy*. Addison-Wesley.
Dunning, J., & Narula, R. (1996). The investment development path revisited: some emerging issues. In J. Dunning & R. Narula (Eds.), *Foreign direct investment and governments: Catalysts for economic restructuring*. Edward Elgar.
Dussel Peters, E. (2000). *La inversión extranjera em México*. CEPAL/ECLAC.
Fishlow, A. (1972). Origins and consequences of import substitution in Brazil. In E. Di Marco (Ed.), *International economics and development: Essays in honor of Raúl Prebisch.* Academic Press.
Fishwick, A. (2019). Labour control and developmental State theory: A new perspective on import-substitution industrialization in Latin America. *Development and Change, 50*(3), 655–678.
Florencio, P. (2016). Technology and innovation in the Brazilian oil sector: Ticket to the future or passage to the past? *Journal of World Energy Law and Business, 9*(4), 237–253.
Gallagher, K., & Porzecanski, R. (2007). What a difference a few years makes: China and the competitiveness of Mexican exports. *Oxford Development Studies, 35*(2), 219–223.
Gereffi, G., & Wyman, D. (1990). *Manufacturing miracles: Paths of industrialization in Latin America and East Asia*. Princeton University Press.
Grumiller, J. (2014). *Ex-ante versus ex-post assessments of the economic benefits of Free Trade Agreements: Lessons from the North American Free Trade Agreement (NAFTA)*. Austrian Foundation for Development Research (ÖFSE). Briefing Paper n. 10.
Guimarães, A. (2021). The political economy of Brazilian industrial policy (2003–2014): Main vectors, shortcomings and directions. *Dados, 64*(2), 1–33.
Guimarães, E. (1996). *A experiência recente da política industrial no Brasil: uma avaliação*. Ipea. Texto para Discussão n. 409.
Hansen, L. (2003). The origins of the maquila industry in Mexico. *Comercio Exterior, 53*(11), 1–16.
Hanson, G. (2002). *The role of maquiladoras in Mexico's export boom*. University of California.
Hanson, G. (2010). Why isn't Mexico rich? *Journal of Economic Literature, 48*(4), 987–1004.
Hausmann, R., Huang, J., & Rodrik, D. (2006). What you export matters. *Journal of Economic Growth, 12*, 1–25.
Hidalgo, C., Klinger, B., Barabási, A., & Hausmann, R. (2007). The product space conditions the development of nations. *Science, 317*(5837), 482–487.
Hirschman, A. (1968). The political economy of import-substituting industrialization in Latin America. *The Quarterly Journal of Economics, 82*(1), 1–32.
Kaldor, N. (1967). *Strategic factors in economic development*. Cornell University Press.
Koopman, R., Wang, Z., & Wei, S. (2013). Estimating foreign value-added in Mexico's manufacturing exports. In Y. Cheung & F. Westermann (Eds.), *Global interdependence, decoupling, and recoupling*. MIT Press.
Koslow, L. (1992). Mexican foreign investment laws: An overview. *William Mitchell Law Review, 18*(2), 441–460.
Kupfer, D., Ferraz, J., & Marques, F. (2013). The return of industrial policy in Brazil. In J. Stiglitz & J. Lin (Eds.), *The industrial policy revolution I* (pp. 327–339). Springer.
Kuznets, S. (1957). Quantitative aspects of the economic growth of nations: II. Industrial distribution of national product and labor force. *Economic Development and Cultural Change, 5*(4-Supplement), 1–111.
Lall, S. (1996). *Learning from the Asian tigers: Studies in technology and industrial policy*. Springer.
Leahy, J. (2012) Brazil's "chicken flight" growth. *Financial Times*. https://www.ft.com/content/3493b84f-9e10-34f4-96b8-610b3d085310
Lessa, C. (1978). *Estratégia de desenvolvimento, 1974-1976: sonho e fracasso*. Unicamp.
Lowe, N., & Kenney, M. (1999). Foreign investment and the global geography of production: Why the Mexican consumer electronics industry failed. *World Development, 27*(8), 1427–1443.
Máttar, J., Moreno-Brid, J., & Peres, W. (2003). Foreign investment in Mexico after economic reform. In K. Middlebrook & E. Zepeda (Eds.), *Confronting development: Assessing Mexico's economic and social policy challenges* (pp. 123–160). Stanford University Press.

Maviglia, S. (1986). Mexico's guidelines for foreign investment: The selective promotion of necessary industries. *The American Journal of International Law, 80*(2), 281–304.

Messa, A. (2017). Impacto de políticas de exigência de conteúdo local: o caso do programa Inovar-Auto. In A. Messa & I. Oliveira (Eds.), *A política comercial brasileira em análise* (pp. 355–373). Ipea.

Moreira, M. (1999). *Estrangeiros em uma economia aberta: impactos recentes sobre produtividade, concentração e comércio exterior*. BNDES. Texto para Discussão n. 67.

Moreno-Brid, J. (2016). A political and industrial framework for structural change and growth: the big question for the Mexican economy. *Problemas Del Desarollo, 47*(185), 57–78.

Moreno-Brid, J., Gómez, J., & Garry, S. (2020). The syncopated dance of Mexico's industrial policy. In H. Veltmeyer & E. Lau (Eds.), *Buen vivir and the challenges to capitalism in Latin America.* Routledge.

Morley, S., & Smith, G. (1971). Import substitution and foreign investment in Brazil. *Oxford Economic Papers, 23*(1), 120–135.

Morley, S., & Smith, G. (1977). The choice of technology: Multinational firms in Brazil. *Economic Development and Cultural Change, 25*(2), 239–264.

Narula, R. (1996). *Multinational investment and economic structure: Globalisation and competitiveness*. Routledge.

Narula, R., & Dunning, J. (2010). Multinational enterprises, development and globalization: Some clarifications and a research agenda. *Oxford Development Studies, 38*(3), 263–287.

Narula, R., & Pineli, A. (2017). Multinational enterprises and economic development in host countries: What we know and what we don't know. In G. Giorgioni (Ed.), *Development finance: Challenges and opportunities.* Palgrave.

Narula, R., & Pineli, A. (2019). Improving the developmental impact of multinational enterprises: Policy and research challenges. *Economia e Politica Industriale, 46*, 1–24.

Newfarmer, R., & Mueller, W. (1975). *Multinational corporations in Brazil and Mexico: structural sources of economic and noneconomic power.* Report to the Subcommittee on Multinational Corporations of the Committee on Foreign Relations—United States Senate. Washington, DC: U.S. Government Printing Office.

Nonnenberg, M. (2003). *Determinantes dos investimentos externos e impactos das empresas multinacionais no Brasil: As décadas de 1970 e 1990.* Ipea. Texto para Discussão n. 969.

Nunnenkamp, P., & Bremont, J. (2007). *FDI in Mexico: an empirical assessment of employment effects*. Kiel Institute for the World Economy (IfW). Working Paper n. 1328.

Pineli, A. (2022). FDI, productivity growth and structural change in European post-communist countries: an industry-level analysis. *Revista Tempo Do Mundo, 29*, 335–386.

Pineli, A., Narula, R., & Belderbos, R. (2021). FDI, multinationals and structural change in developing countries. In L. Alcorta, N. Foster-Mcgregor, B. Verspagen, & A. Szirmai (Eds.), *New perspectives on structural change: causes and consequences of structural change in the global economy.* Oxford University Press.

Piquet, R., Hasenclever, L., & Shimoda, E. (2016). O desenvolvimento e a política de conteúdo local na indústria petrolífera: Visões divergentes. *Revista Tecnologia e Sociedade, 12*(24), 45–48.

Porcile, G. (2021). Latin American structuralism. In L. Alcorta, N. Foster-Mcgregor, B. Verspagen, & A. Szirmai (Eds.), *New perspectives on structural change: causes and consequences of structural change in the global economy.* Oxford University Press.

Prebisch, R. (1949). O desenvolvimento econômico da América Latina e seus principais problemas. *Revista Brasileira De Economia, 3*(3), 47–111.

Sargent, J., & Matthews, L. (2004). What happens when relative costs increase in export processing zones? Technology, regional production networks, and Mexico's maquiladoras. *World Development, 32*(12), 2015–2030.

Sargent, J., & Matthews, L. (2008). Capital intensity, technology intensity, and skill development in post China/WTO maquiladoras. *World Development, 36*(4), 541–559.

Sarti, F., & Laplane, M. (2002). O investimento direto estrangeiro e a internacionalização da economia brasileira nos anos 1990. *Economia e Sociedade, 11*(1), 63–94.

Schatan, C., & Enríquez, L. (2015). Mexico: Industrial policies and the production of information and communication technology goods and services. *Cepal Review, 117*, 147–163.

Schutte, G. (2021). A economia política do conteúdo local no setor petrolífero de Lula a Temer. *Economia e Sociedade, 30*(1), 115–140.

Serrano, A. (2016). Foreign banks and credit in Mexico. *Global Finance Journal, 30*, 77–93.

Singer, H. (1950). The distribution of gains between investing and borrowing countries. *American Economic Review, 40*(2), 473–485.

Stein, G., & Herrlein Júnior, R. (2016). Política industrial no Brasil: Uma análise das estratégias propostas na experiência recente (2003–2014). *Planejamento e Políticas Públicas, 47*, 251–287.

Sturgeon, T., Chagas, L., & Barnes, J. (2017). *Inovar-Auto: Evaluating Brazil's automotive industrial policy to meet the challenges of global value chains*. World Bank.

Suzigan, W. (1988). Estado e industrialização no Brasil. *Revista De Economia Política, 8*(4), 5–16.

Suzigan, W., & Furtado, J. (2006). Política industrial e desenvolvimento. *Revista De Economia Política, 26*(2), 163–185.

Suzigan, W., Garcia, R., & Feitosa, P. (2020). Institutions and industrial policy in Brazil after two decades: Have we built the needed institutions? *Economics of Innovation and New Technology, 29*(7), 799–813.

Tordo, S., Warner, M., Manzano, O., & Anouti, Y. (2013). *Local content policies in the oil and gas sector*. World Bank.

Utar, H., & Ruiz, L. (2013). International competition and industrial evolution: Evidence from the impact of Chinese competition on Mexican maquiladoras. *Journal of Development Economics, 105*, 267–287.

van der Straaten, K., Narula, R., & Giuliani, E. (2023). Multinational enterprises, development and inequality of opportunities: A research agenda, *Journal of International Business Studies* (**forthcoming**)

Vargas, T. (2021). *Inovar-Auto: uma nova política para velhos interesses.* Curitiba: Universidade Federal Tecnológica do Paraná. (PhD Thesis).

Vidal, G. (1986). Capital monopolista nacional y extranjero, relaciones entrelazamientos, contradicciones. In A. Aguilar, V. Sahagun, A. Guillen, & G. Vidal (Eds.), *El capital extranjero en Mexico.* Editorial Nuestro Tiempo.

Vidal, G., Marshall, W., & Correa, E. (2011). Differing effects of the global financial crisis: Why Mexico has been harder hit than other large Latin American countries. *Bulletin of Latin American Research, 30*(4), 419–435.

Waldkirch, A. (2010). The effects of foreign direct investment in Mexico since NAFTA. *The World Economy, 33*(5), 710–745.

Willmore, L. (1987). Controle estrangeiro e concentração na indústria brasileira. *Pesquisa e Planejamento Econômico, 17*(1), 161–190.