

AN INVESTIGATION INTO SHAPES AND DETERMINANTS OF DEINDUSTRIALIZATION PROCESSES: THEORY AND EVIDENCE FOR DEVELOPED AND DEVELOPING COUNTRIES (1970-2017)

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Abstract:

This paper theoretically and empirically investigates deindustrialization as a process with multiple and complex causes, linked to distinct factors and sensitive to the degree of economic development. Supported by the theoretical framework that reaffirms the centrality of the manufacturing industry for economic growth, we sought to understand the main determinants of deindustrialization in both developed and developing countries during the period 1980-2017, through the panel data analysis methodology. Our main results suggest that there are common causes that contribute to explaining the advancement of the process of deindustrialization, among them, the increase in per capita income, a fact already consecrated in the literature. The importance of other variables, however, has shown to be dependent on the level of economic development: in the least developed countries, variables such as the exchange rate and the "primarization" of the economy have been prominent factors, while in advanced countries the importance of "relocation" or "delocalization" of physical production has been emphasized. With respect to the degree of trade openness, this has proven to be an ambiguous factor, benefiting countries initially better-positioned in global manufacturing trade but with inconclusive effects on the lesser competitive countries. In view of these results, a closer look at the causes and costs of deindustrialization, especially in developing countries.

Keywords: Deindustrialization. Developed and Developing Economies. Economic growth.

Resumo:

Este trabalho investiga teórica e empiricamente a desindustrialização como um processo de múltiplas e complexas causas, ligado a fatores distintos e sensíveis ao grau de desenvolvimento econômico. Apoiado pelo referencial teórico que reafirma a centralidade da indústria de transformação para o crescimento econômico, procuramos compreender os principais determinantes da desindustrialização em países desenvolvidos e em desenvolvimento no período de 1980 a 2017, por meio de uma análise de dados em painel. Nossos principais resultados sugerem que existem causas comuns que contribuem para explicar o avanço do processo de desindustrialização, dentre elas, o aumento da renda per capita, fato já consagrado na literatura. A importância de outras variáveis, no entanto, mostrou-se dependente do nível de desenvolvimento econômico: nos países menos desenvolvidos, variáveis como a taxa de câmbio e a "reprimarização" da economia têm sido fatores proeminentes, enquanto nos países avançados a importância da "realocação" ou "deslocalização" da produção física tem sido enfatizada. Com relação ao grau de abertura comercial, este mostrou-se como um fator ambíguo, beneficiando os países inicialmente melhor posicionados no comércio manufatureiro global, mas com efeitos inconclusivos nos países menos competitivos. Diante desses resultados, é fundamental uma análise mais aprofundada das causas e custos da desindustrialização, principalmente nos países em desenvolvimento.

Palavras-chave: Desindustrialização. Países em desenvolvimento. Crescimento econômico.

JEL Code: O25 L60 F46

Área 9 - Economia Industrial e da Tecnologia

1. Introduction

Unlike the neoclassical-inspired models, post-Keynesian literature (Kaldor, 1966; Thirlwall, 1979) and other heterodox approaches, such as Latin American structuralists (Prebisch, 1949) and neo-Schumpeterians (Freeman & Soete, 1997; Nelson & Winter, 1982), have long emphasized the role of structural change and technological advancement in economic growth. Despite the centrality of industrial activity, recognized in the aforementioned literature, a declining trend has been observed both in the share of value added of the manufacturing sector in total value added and of the share of its employment in total employment.

Between 1970 and 2017, the relative share of the manufacturing sector in developed countries declined, in constant prices, from 17.2% to 15%, while employment share fell from 28.5% to 12.9%. In developing countries, although the relative share of value added fell from 14.7% to 12.1% in the period 1970-2017, their trajectories were quite different: in Asian economies it increased considerably, rising on average from 11.9% to 14.5%, but in most other developing countries it declined, with a notable drop from 18.6% to 13.9% in Latin America. Their employment trajectories, however, were more similar: although, on average, it remained between 12% and 13% in the period 1970-2017, it rose in Asia from 11.9% to 14.5% and decreased from 15.5% to 11.9% in Latin American, for example.

In many countries, particularly in the advanced ones, a reduction in the share of the manufacturing sector in the economy might be a natural consequence of the development process itself. However, more recently, it has been noted that this has become associated with the advance of financial and productive globalization. In fact, the phenomenon has triggered a real revolution in the financial, productive and business structure, leading to a reorganization in practices at the level of firms: an expansion and migration of the manufacturing industry from developed economies to developing countries, or to whole regions with notoriously lower wages, devalued exchange rates and high labor productivity – the so-called relocation phenomenon. This has led to a change in the global and regional geography of production and international trade, significantly affecting the productive structure in advanced countries like the United States, Europe and even Japan. In developing economies, though, the trajectory apparently has been different (Pisano & Shih, 2009).

The process of deindustrialization can also be explained by other means. Macroeconomic policies, for example, by interfering in the trajectory of key prices such as interest rates and the exchange rate, can determine the performance of the industrial sector, especially in developing countries where the degree and form of economic openness may be among the drivers of structural change. Such policies can generate another form of deindustrialization – a “Dutch Disease” kind of phenomenon, having an increase in exports of basic products (such as agricultural commodities or extractive minerals), replacing exports of industrial products. Deindustrialization, then, results from inadequate external integration policies that stimulate the financialization of the economy to the detriment of the real sector (Bresser-Pereira, 2014; Palma, 2005).

In light of the above, this paper aims to analyze theoretically and empirically the deindustrialization underway in recent decades, particularly with regard to the share of the manufacturing sector in total output. We seek to identify basic determinants in both developed and developing economies. With a view to test the main arguments in the literature and capture the determinants of the value added share of the manufacturing sector, the empirical part of our research estimates a panel data model with 61 developed and developing countries, between 1970 and 2017.

Our research hypothesis is that, in the context of market liberalization, greater integration and financialization has impacted economies differently, due to their distinct abilities to deal with macroeconomic instability and to implement domestic policies (among them, relatively independent industrial policies). This has mitigated the tendency towards the stagnation of demand, which reinforces the worldwide trend of deindustrialization, as well as the capacity to generate trajectories of endogenization of technological progress and active external integration.

The remainder of this paper is divided into four sections. Section 2 reviews the key role of the manufacturing industry in economic growth. Section 3 briefly examines the recent worldwide trends in the decline of the relative share of the manufacturing industry, both in terms of value added and industrial employment, and discusses possible explanatory elements. Section 4 investigates empirically the determinants of the share of value added of the manufacturing sector in total value added in several developed and developing countries, extending the basic model to analyze the effects of trade liberalization in different contexts. Section 5 offers some final considerations adding that a variety of factors (e.g., the increase in per capita GDP, interest rates, and the degree of financial integration) can be considered important in explaining the deindustrialization process in both developed and developing economies. The influence of some other variables, however, appears to be dependent on the level of economic development. For less developed economies, the exchange rate and their “primarization” have been prominent, while for advanced economies, “relocation” of production seems to stand out. The degree of trade openness, though, plays as an ambiguous variable: benefiting countries initially better positioned among the manufactures in world trade, while for less competitive countries its effects seem inconclusive.

2. Industry at the core of economic growth and development

Recently, there has been renewed interest in the role of the manufacturing sector in the promotion of economic growth and development. Some factors observed in the world economy have contributed to this.

First, many developing economies have failed in their attempt to deepen and diversify their industrial capacity, and more than that, many of them have seen the share of the manufacturing sector in GDP shrink prematurely. Second, there is the perception that the export-led growth strategies of developing countries face more constraints now than in the past, particularly because of the slow pace of growth in global demand. Third, many developing countries remain highly vulnerable to external shocks, both commercially and financially. Fourth, the extraordinary export revenues of primary products, brought about by the commodity price boom in the 2000s, have come to an end. Finally, the deindustrialization of advanced economies, due to their stagnation in the post-2007 global crisis, has been a growing concern (UNCTAD, 2016).

In the literature, there are strong theoretical and empirical arguments that support industrialization as the main engine of economic growth and development. Szirmai (2012)¹ offers a synthesis of the main arguments:

- i. There is an empirical correlation between the degree of industrialization and the per capita income in developing countries.
- ii. Productivity in the manufacturing sector is greater than in the agricultural sector, such that the transfer of resources from the second to the first provides a structural change bonus. This means the manufacturing sector presents higher rates of productivity growth than other sectors.
- iii. The transfer of resources from the manufacturing sector to the services sector provides a structural change burden, under the terms described by Baumol’s Law.² As the relative share of services rises, per capita GDP growth tends to slow.
- iv. Compared to agriculture, the manufacturing sector offers special opportunities for capital accumulation. This can be easily realized in the more spatially concentrated environment of the

¹ The literature reviewed is extensive, ranging from the founding works of Lewis (1954), Hirschman (1958), Kaldor (1966), Cornwall (1977), and others, to the more recent works of Fagerberg and Verspagen (2002), Rodrik (2009), among others.

² Baumol’s Law derives from the observation that in the various branches of the services sector the possibilities for productivity growth are limited due to the labor-intensive nature of the sector. Especially for developing countries that have not yet reached high levels of productivity, an increase in the relative share of services in the economy would mean a slowdown in productivity growth and, thus, in GDP growth per capita (Szirmai, 2012).

processing industry than in the more spatially dispersed agricultural sector, since the former is more capital intensive than the latter, especially in developing countries. Thus, an increase in the relative share of the manufacturing sector contributes to aggregate growth.

- v. The manufacturing sector offers special opportunities for economies of scale, which are less available in agriculture or services.
- vi. The manufacturing sector offers special opportunities for technological progress, since technological advances originating in the industry are diffused to other sectors of the economy.
- vii. Linkage and spillover effects are stronger in the manufacturing sector than in the agricultural or extractive industries.
- viii. As per capita income grows, the share of spending on agriculture decreases relative to the total and the relative share of spending on manufactured goods increases (Engel's Law). Thus, countries that specialize in the production of primary goods do not benefit from the expansion of global markets for manufactured goods.

Within this line of reasoning, the dynamics of economic growth driven by industrialization can be understood as a process of “cumulative causation” (Myrdal, 1957; Kaldor, 1957), in which demand and supply factors interact. With the expansion of the manufacturing sector, there is an increasing absorption of goods (e.g., food, raw materials and extractive industry materials) and services (e.g., banking and financial services, insurance, trade, etc.) produced outside the industrial sector, generating jobs, income, and demand. The manufacturing sector also accelerates productivity increases, boosting income and demand growth. Due to linkage and spillover effects, the continuous upgrading of productive capacity tends to favor (i) productivity gains in other sectors, (ii) the adoption of more advanced technologies, (iii) the production of more sophisticated products, and (iv) integration in global value chains at increasing levels of complexity (Cantore et al., 2014; UNCTAD, 2016).

Recently, an increasing number of authors have emphasized the importance of industrialization as a key element for a strategy of economic growth (Palma, 2010, Rodrik, 2008, TIMMER, VRIES & VRIES, 2015). Especially for developing countries implement macroeconomic policies for this purpose is an essential condition for embarks on a sustainable path of catching up with both levels of income per capita and quality of life relatively close to the developed countries.

3. Recent trends of industry in the global economy

Over the past four and a half decades, significant changes have occurred in the sectors of economic activity around the world. According to the regional groupings by UNCTADstat (2019), developing and transition economies³ have expanded their share of global output between 1970 and 2017, through growth in both industrial value added⁴ and services, from 7.5% to 13.1% and from 7.9% to 18.7%, respectively, while the share of the primary sector has remained virtually constant, at around 2.5%. Furthermore, in relation to global value added, the share of industry of developed countries declined from 27.9% to 15% between 1970 and 2017, with services falling marginally from 54.6% to 47.6%.

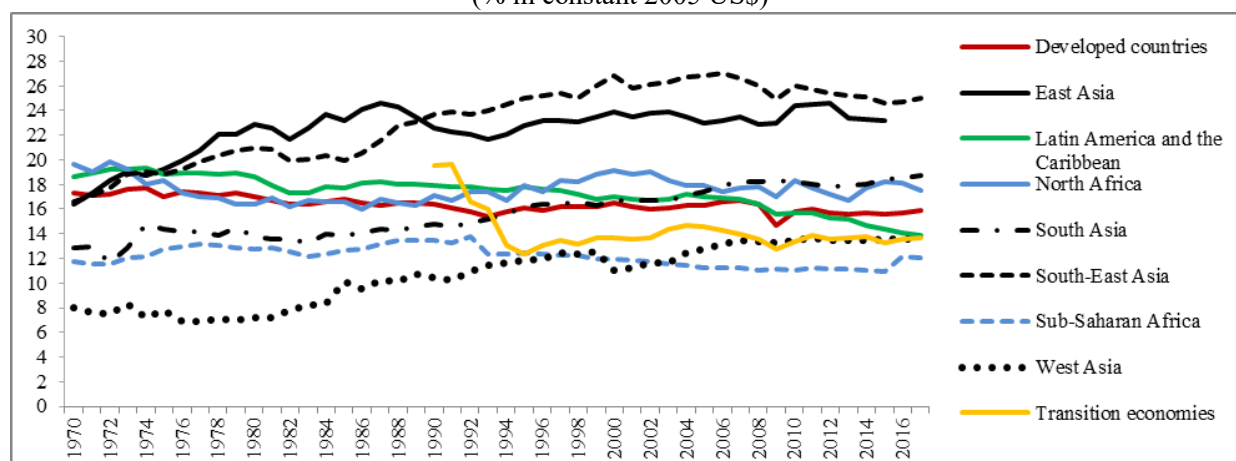
The manufacturing sector of developed economies, in particular, experienced a fall from 14.5% to 9.7% in the same period. The share of the industrial sector in the group's value added also declined, falling from 33.1% to 23.6%, and although services increased their share from 64.7% to 75.1%, globally they have reduced slightly. In developing and transition economies, the average share of the services sector in the group's aggregate value added also has increased, from 44.2% to 54.5%. On the other hand, the average share of the industrial sector has dropped slightly from 42.1% to 38.1%, which – in view of the increasing share of the sector in terms of global value added – implies quite distinct performances regionally or even individually.

³ For manufacturing value added, specifically, country grouping in UNCTADstat does not include China.

⁴ This includes both processing and extractive industries.

Taken as a group, the manufacturing share in developing and transition economies total value added reduced slightly from 14.9% to 12.1% in the period 1970-2017, while in developed economies the sector's share fell from 17.2% to 15.4%. Graph 1 shows the different trajectories of the regional groups. From 1970 to 2017, with the exception of the Asian regions, there was a general reduction in the share of the manufacturing sector in total value added. A reduction in the “industrial gap” of other developing and transition economies vis-à-vis advanced economies is observed.

Graph 1 – Share of the manufacturing sector in total regional value added, 1970-2017
(% in constant 2005 US\$)

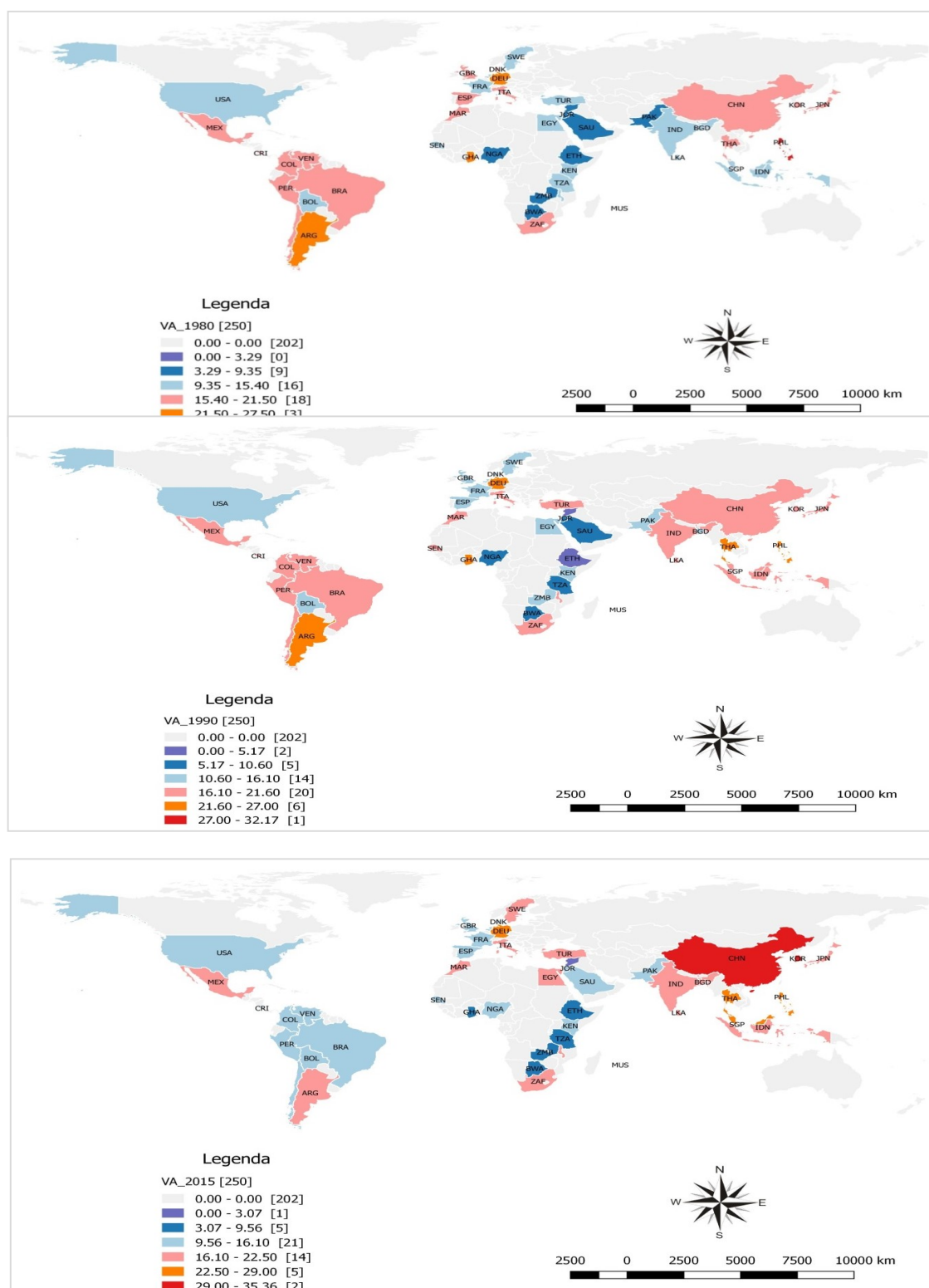


Source: Author's own elaboration, based on UNSD, *National Accounts Main Aggregates database*, and Groningen Growth and Development Center, *GGDC 10-sector database*.

Note: Regional values correspond to unweighted averages. The manufacturing sector corresponds to sector D of ISIC Rev. 3. The samples of country groups are as follows: Developed countries: Denmark, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom and the United States of America. North Africa: Egypt and Morocco. Sub-Saharan Africa: Botswana, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Senegal, South Africa, the United Republic of Tanzania and Zambia. Latin America and the Caribbean: Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru and the Plurinational State of Bolivia. East Asia: China, Hong Kong, the Republic of Korea and Taiwan Province of China. South-East Asia: Indonesia, Malaysia, the Philippines, Singapore and Thailand. South Asia: Bangladesh, India, Pakistan and Sri Lanka. West Asia: Bahrain, Jordan, Saudi Arabia, the Syrian Arab Republic and Turkey. Transition economies: Albania, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, the former Yugoslav Republic of Macedonia, Republic of Moldova, the Russian Federation and Ukraine.

Figure 1 illustrates the gradual loss of representativeness in the total value added of the manufacturing sector in a large portion of Europe's developed economies and in practically the whole of Latin America, while the economies of East and Southeast Asia significantly increased their relative shares – principally China and South Korea, but also Thailand, Malaysia and Indonesia.

Figure 1 – Spatial distribution of the manufacturing sector in total value added, 1980, 1990 and 2015



Source: Author's own elaboration, based on UNSD, *National Accounts Main Aggregates database*.

Regarding employment in the manufacturing sector, the picture is slightly different. In the group of developed countries, the other face of deindustrialization is much more pronounced. According to Table 1, between 1970 and 2017 the average share of employment in manufacturing activities relative to total employment fell from 28.5% to 12.9%. In Latin America, employment in the manufacturing sector also declined from the 1980s, when it accounted for 15.4% of the total, reaching 11.9% in 2017.

Table 1 – Share of the manufacturing sector in total employment, 1970-2017 (in %)

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2017
Developed countries	28.5	27.0	25.3	23.2	22.7	20.0	18.7	16.4	13.6	13.1	12.9
Germany	39.5	35.7	34.0	32.3	31.6	25.0	23.8	22.1	20.0	19.3	19.0
Japan	27.0	25.8	24.7	25.0	24.1	22.6	20.5	18.0	16.8	16.2	16.1
United Kingdom	34.7	30.6	27.7	22.6	28.7	18.9	16.9	13.2	9.8	9.6	9.1
United States	22.2	19.8	19.2	18.1	16.8	15.5	15.2	12.4	11.0	11.0	10.7
Latin America and the Caribbean	15.5	15.5	15.7	14.9	15.8	14.9	13.6	13.1	12.6	12.2	11.9
Argentina	23.5	21.6	21.4	24.7	24.3	20.0	14.0	14.3	13.6	13.1	12.3
Brazil	13.3	13.3	15.0	14.7	15.2	14.9	13.9	14.2	12.7	11.8	11.5
Chile	20.1	20.7	17.3	13.8	16.1	16.3	14.0	13.1	11.3	11.1	10.8
Mexico	18.0	18.8	19.9	19.2	19.2	15.6	19.6	16.8	15.4	16.0	16.6
East Asia	13.7	25.0	27.3	26.6	25.1	20.9	18.2	17.3	16.8	15.8	...
China	7.8	10.3	13.8	14.8	14.9	15.4	14.5	16.4	19.2	...	...
Hong Kong	...	44.8	42.1	36.1	27.7	18.4	10.4	6.7	3.8	3.0	...
Republic of Korea	13.2	18.6	21.6	23.4	27.2	23.6	20.3	18.5	17.0	17.4	16.9
Southeast Asia	11.7	12.8	14.1	13.2	15.2	16.7	16.5	14.8	14.0	13.3	14.1
Indonesia	7.9	6.7	9.0	9.3	10.1	12.6	13.0	12.7	12.5	13.7	14.1
Malaysia	...	9.9	13.7	13.4	17.7	23.3	24.4	20.8	17.7	16.5	16.9
Thailand	5.4	10.3	7.9	8.5	10.2	13.4	14.5	14.8	14.1	17.0	16.7
South Asia	9.4	11.3	11.8	11.3	12.6	12.5	10.1	13.7	13.6	16.8	16.6
India	9.4	9.0	9.1	9.6	10.5	10.7	11.4	11.6	11.6	...	...
Pakistan	...	13.6	14.5	13.7	12.7	10.4	11.5	13.7	13.5	15.5	16.2
Sri Lanka	...	...	12.0	12.6	14.6	16.3	...	18.4	17.1	18.0	19.3
West Asia	12.6	11.8	12.2	14.8	14.5	15.5	13.5	11.2	13.4	12.9	12.7
Turkey	...	...	...	14.6	14.8	14.9	15.8	...	18.7	18.7	17.6
North Africa	13.0	13.6	14.6	14.4	14.2	14.5	13.1	12.6	12.7	11.1	12.0
Egypt	15.1	14.4	14.7	13.3	13.0	14.2	11.9	11.5	12.1	11.2	12.0
Sub-Saharan Africa	6.4	7.9	8.4	8.5	9.6	11.0	11.2	9.2	9.3	13.3	12.8
South Africa	13.3	14.2	16.5	16.1	14.7	13.2	14.9	15.6	13.3	11.2	11.0
Transition economies	...	...	19.8	18.0	19.4	13.0	8.9	11.3	9.3	11.2	11.4
Russian Federation	...	...	...	...	26.5	21.9	19.5	18.2	15.2	14.3	14.2

Source: Author's own elaboration, based on International Labour Organization, *ILOSTAT* and Groningen Growth and Development Centre, *GGDC-10 Sector Database*.

Note: Regional values correspond to unweighted averages. The manufacturing sector corresponds to sector D of ISIC Rev.3 or C in Rev. 4. The samples of country groups are as follows: Developed countries: Denmark, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom and the United States of America. North Africa: Egypt and Morocco. Sub-Saharan Africa: Botswana, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Senegal, South Africa, the United Republic of Tanzania and Zambia. Latin America and the Caribbean: Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru and the Plurinational State of Bolivia. East Asia: China, Hong Kong, the Republic of Korea and Taiwan Province of China. South-East Asia: Indonesia, Malaysia, the Philippines, Singapore and Thailand. Transition economies: Albania, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, the former Yugoslav Republic of Macedonia, Republic of Moldova, the Russian Federation and Ukraine.

The decline in industrial employment was also significant since the 1980s in East Asia, the transition economies and South Africa, while in some other countries in Africa and Asia, like India and West Asia, there was relative stability or a slight increase, in general.

In contrast, there was strong growth in employment in manufacturing in several Asian countries, notably China, Indonesia, Thailand, Pakistan, Sri Lanka and Turkey, although currently more mature economies such as Hong Kong, South Korea and Singapore have negatively affected the behavior of some of these regional averages, especially since the 1990s.

The conventional interpretation is that deindustrialization is a natural outcome of the development process, due to the combination of changes in the composition of demand and the greater productivity gains in the manufacturing sector compared to the others. Assuming that income elasticity of demand for manufactures is greater than unity in the early stages of development, and in the more advanced stages, it becomes less than unity, then in the course of the development process this change in the composition of demand would favor the services sector to the detriment of the manufactures. In isolation, this factor would be insufficient to explain deindustrialization as it disregards the influences of productivity and the changes in relative prices in the structure of demand, and thus in industrial output and employment. Assuming the same conditions for income elasticity of demand, given that labor productivity grows more rapidly in the manufacturing sector, then in the course of economic development there would be a reduction in the relative prices of manufactured goods, stimulating demand for them in the early stages, while in the more advanced stages there would be a substitution effect towards other items, such as services (Rowthorn & Ramaswamy, 1999).

Therefore, the net effect on industrial output and employment depends crucially on the behavior of demand in response to changes in relative prices. Depending on the response of demand to the falling prices of manufactures, the change in production and employment may be positive or negative. In the advanced economies, there is strong evidence that the fall in relative prices for manufactures due to productivity gains is not sufficiently compensated by an increase in demand for these goods ($\sigma < 1$), so that the relative quantities of the sector (value added and employment) begin to decline, with the decline in employment relatively faster (Rowthorn & Ramaswamy, 1999; Lawrence & Edwards, 2013, Rodrik, 2016).

Other frequently analyzed aspects refer to the phenomenon of globalization, particularly in regards to the effect of international trade or a new international division of labor, where depending on the established pattern of trade there could be a specialization in production between manufactured goods and other goods and services, or even a specialization within the manufacturing sector between the production of skilled and unskilled labor-intensive goods. For developed countries, although this is not the main means affecting deindustrialization, evidence suggests a negative impact on demand for labor, particularly less skilled or less specialized labor (Wood, 1995; Rowthorn & Ramaswamy, 1999).

In developing countries that are deindustrializing, however, it is unlikely that the classic argument of the combination of changes in the composition of demand and labor productivity will apply, since, given the elasticity of demand at this stage of economic development, the difference in productivity in the manufacturing sector would further stimulate demand for industrial goods, feeding the sector's growth. An alternative explanation lies precisely in international trade.

According to Rodrik (2016), a plausible interpretation is that when they opened up to international trade, developing countries were hit by a double blow. First, those without solid comparative advantage in the manufacturing sector became net importers of these goods, reversing the long process of import substitution. Second, by being exposed to the relative price trends in advanced economies, developing countries would have "imported" the deindustrialization of those countries. This is because the fall in relative prices of manufactures in advanced economies squeezed the price globally, even in those countries that had not yet experienced high technological progress. In fact, considering the regional groups, the author finds evidence that the regions with strong comparative

advantage in manufactures managed to avoid the decline in the relative share of output and employment, and even when this occurred, it was less severe. Consequently, the main beneficiaries of globalization would have been the Asian countries, while the adverse effects would have mainly been felt in Latin America, particularly in terms of employment.

The recent process of relocation of industrial plants around the globe is also receiving attention as a factor that induces deindustrialization, especially in developed economies. According to Palley (2015), a critical change brought about by globalization is high international mobility of the factors of production (capital and technology), resulting from improvements in the transport sector, communications, and in the ability to manage globally diversified production networks. This has created a new global production model configured around the principle of global cost arbitrage, in search of, for example, favorable exchange rates, lower taxes, subsidies, less regulation, and abundant and cheap labor.

Palma (2005, 2008), Palley (2015) and UNCTAD (2016), also note that since the 1980s deindustrialization in developed economies – particularly in some European ones – has not been very harmonious or spontaneous, since it has been following the path of political, financial and institutional transformations that have generated macroeconomic instability and a regressive distribution of income. This could contribute to the slowdown in aggregate demand and limit the capacity of the services sector to productively absorb the labor freed from the industrial sector, which in turn leads to high and persistent levels of unemployment and underemployment, to underconsumption and to low levels of productive investment in these economies. These elements could also apply to developing economies experiencing premature deindustrialization.

In other words, the intensification of deindustrialization could be the result of inadequate policies and a negative structural change (financialization). Austere macroeconomic policies, particularly high interest rates and overvalued exchange rates, would have more pronounced negative effects on industry and the “real economy” than on the financial sector, contributing to the financialization and, concomitantly, to deindustrialization. Moreover, liberalization itself and increasing deregulation help to reduce autonomy in domestic economic policy, whereby key prices, such as interest rates and exchange rates, and national policy objectives (e.g., industrial policy) are often destabilized and hampered by the interests of foreign organizations and by dominant players in the financial market, both locally and internationally.

In view of this, the recent industrializing success of Asian economies is attributed in large part to the fact that their governments have subordinated the financial sector to the needs of industrial development through strong regulation and the mobilization of financial sector resources. In contrast to this is Latin America, where since the 1980s the lack of consensus or strategy for industrial development after the exhaustion of the import substitution process and the shift toward a liberalizing agenda and market friendly reforms could help to explain the stagnation of productivity in these economies.⁵

Finally, an additional source of deindustrialization defined by Palma (2005, 2008) is the “Dutch Disease”. This phenomenon is associated with a change in the “natural” trajectory of industrialization or with an excessive degree of deindustrialization relative to what would be expected given the level of per capita income, the productivity of the manufacturing sector, and the elasticities of demand, etc. This “extra” degree of deindustrialization could result from three different situations: (i) the discovery of abundant natural resources (e.g., the Netherlands), (ii) a significant increase in the export of services, particularly in finance and tourism (e.g., Hong Kong and Greece, respectively), and (iii) changes in economic policy, especially financial and trade liberalization in middle-income countries (e.g., Brazil and South Africa).

⁵ For a detailed discussion of these arguments, see, for example, Palma (2010) and Lechevalier, Debanes and Shin (2016).

Therefore, there are several sources of deindustrialization, and there are probably different combinations of these sources that explain this process in each country in a given period of time better than any of them considered in isolation. In this paper, the intended contribution to the literature is to offer a more detailed analysis on the aspects associated with globalization, such as trade openness and greater financial integration. In light of this, it is understood that the prioritization of financial accumulation to the detriment of productive investments could have contributed to the establishment of high global macroeconomic instability and stagnation of aggregate demand, in which the worldwide trend of deindustrialization emerges as a reflex.

4. An empirical investigation into the causes of deindustrialization in developed *and* developing economies

In the previous sections, it was pointed out that a reduction in the share of industry in GDP can be a natural consequence of the process of economic growth. Moreover, other variables linked to macroeconomic stability, such as interest rates and exchange rates, may contribute to the performance of the industrial sector, especially in developing countries, since their effects can be exacerbated by the degree of openness of foreign economies.

Another factor to consider is the Dutch disease, which could be related, for example, to an increase in the export of primary products. Also worthy of mention in the case of developed economies is the relocation of industry phenomenon, in which many large companies move their plants to developing economies with lower production costs. Finally, deindustrialization could result from inadequate policies and a negative structural change made evident by the increase in financialization to the detriment of the real sector.

That said, equation (1) attempts to capture these determinants of the share of value added of the manufacturing, in both developed and developing countries.

$$vaman_{it} = gdppc_{it} + vaprim_{it} + rer_{it} + nirlend_{it} + ififtit + fdigdp_{it} + open_{it} + u_{it} \quad (1)$$

where, *vaman* is the value added of the manufacturing sector in total value added; *gdppc* is the per capita GDP; *vaprim* is the value added of the agricultural sector in total value added of the economy; *rer* is the real exchange rate; *nirlend* is the interest lending rate; *open* is the degree of trade openness of the economy, measured as the sum of exports and imports in proportion to GDP; *fdigdp* are the acquisitions of direct investments abroad by the residents, in terms of GDP, used as a proxy for the relocation of production.

Regarding the *ifift* variable, it should be noted that this indicator generally expresses the degree of financial integration or de facto financial liberalization of an economy and is given by the aggregation of financial inflows and outflows registered by the balance of payments of each country, in proportion to the trade flows.⁶ Considering that the phenomenon of financialization can be envisaged in general terms as a gain in importance of the financial sector relative to the real sector, it is understood here that this integration variable can also capture movements in this direction, when considering in external terms whether the country's integration is predominantly via the financial or the productive sector.

These variables, their sources and the list of developed and developing countries are described in detail in Table 2 and Table 3 in the Appendix to this paper. There are data for 61 countries between 1980 and 2017, but given the lack of some observations, this is an unbalanced panel of data. However, taking into account the presence of endogeneity between the variables of the model, the dynamic panel data model approach was considered, based on the generalized method of moments (GMM) proposed

⁶ For a discussion on this and other measures of financial integration, see Lane and Milesi-Ferreti (2007) and Kose et al. (2009).

by Arellano and Bond (1991), which is consistent when applied to dynamic models. This leaves us with the following equation:

$$\Delta Y_{it} = \Delta \alpha_i + \delta \Delta Y_{it-1} + \beta' \Delta X_{it} + \Delta \varepsilon_{it} \quad (2)$$

Our strategy consists of using the GMM method to estimate the model in first difference, using all possible lags as an instrument for the lagged variable. For endogenous variables, their lagged levels are used as instrumental variables, and for predetermined variables, their levels are lagged once. This method seeks to use all the information contained in the sample to construct the set of instrumental variables, concomitantly eliminating the specific non-observable effect and allowing the estimation. The result of the estimation of equation (1) for the developed countries is in Table 2.

In the case of developed economies, the increase in per capita GDP is the main determinant for the reduction in the share of value added of the manufacturing sector. The negative relationship between GDP per capita growth and the relative share of industry in GDP is a crystallized fact in the literature and is associated with the degree of economic development and changes in elasticities of demand. The proxy for financial integration and financialization, the degree of trade openness variables and the proxy for the relocation of industry also presented statistical significance.

Table 2 – Determinants of manufacturing in developed economies, dependent variable d.lnvaman

	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
lnvaman(-1)	0.8885992	0.0297917	29.83	0.000	0.8302085	0.9469898
lnvaprim	0.0015774	0.0273681	0.06	0.954	-0.0520632	0.055218
lngdpp(-1)	-0.1058458	0.0391724	-2.70	0.007	-0.1826224	-0.0290690
lnrer	-0.0048183	0.0194945	-0.25	0.805	-0.0430269	0.0333902
fdigdp(-1)	-0.0010468	0.0003445	-3.04	0.002	-0.0017219	-0.0003716
lnopen	0.1026286	0.0220729	4.65	0.000	0.0593665	0.1458907
nirlend	0.0010827	0.0011824	0.92	0.360	-0.0012347	0.0034002
lnifit(-1)	-0.0123464	0.0062699	-1.97	0.049	0.0000575	0.0246352
Cons	0.9735952	0.3924956	2.48	0.013	0.204318	1.742872

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(134) = 137.3679

Prob > chi2 = 0.4034

AR(2) -1.13 (0.260)

Source: Own elaboration from the research data

These results corroborate the arguments presented earlier that, among other factors, the deepening of financial integration and financialization would play an important role in explaining the performance of the manufacturing sector in the recent period. In addition, the process of relocation of industrial plants, which are concentrated according to the direct investment flows of the developed economies, also contributed negatively to manufacturing production. Obviously, not all direct investment is destined for the industrial sector. Yet the significance and the final effect of this variable suggest that, at least for developed countries, an important part of the volume of investment flows is associated with this sector. However, the real exchange rate and the value added of the agricultural sector were not significant, contradicting, at first, assumptions associated with the effects of real exchange rate appreciation, or even a structural change toward the primary sector of the economy.

As for financial integration, contrary to the theoretical formulations in favor of openness and financial integration, several empirical studies have shown that there is no strong evidence of a positive

relationship between greater liberalization/financial integration and economic growth.⁷ The high destabilizing potential of globalized finance, though, is indisputable in light of history, particularly for developing countries. Singling out from extensive literature, it is worth mentioning Prasad, Rajan and Subramanian (2007) and Eichengreen et al. (2009), who found a positive relationship between financial openness and growth in the industrial sector. However, this effect is limited to high-income countries with developed financial systems and sound institutions. And in the case of Eichengreen et al. (2009) these positive effects are canceled out in crises. For these reasons, the results found here contribute to reinforcing the skepticism regarding the net benefits of financial integration.

For developing economies, the results of the estimation of equation (1) can be found in Table 3. Regarding these countries, the significance of the variable used as a proxy for the Dutch disease or for the primarization of productive activity to explain the fall in the share of the manufacturing sector in total output, as well as per capita GDP, stands out. Additionally, the proxy for financial integration and financialization contributed negatively, which is in line with the result obtained for the developed countries. In contrast, however, the real exchange rate was statistically significant, indicating that higher levels of the exchange rate (devalued) positively influenced the value added of the manufacturing sector.

Table 3 – Determinants of manufacturing in developing economies, dependent variable d.lnvaman

	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
lnvaman(-1)	0.8798693	0.0119476	73.64	0.000	0.8564524	0.9032861
lnvaprim	-0.022793	0.0103219	-2.21	0.027	-0.0430234	-0.0025625
lngdppc(-1)	-0.0440518	0.0210025	-2.10	0.036	-0.085216	-0.0028877
lnrer	0.0284417	0.0082299	3.46	0.001	0.0123114	0.044572
fdigdp(-1)	-0.0000302	0.0000832	-0.36	0.717	-0.0001931	0.0001328
lnopen	0.0106223	0.0078276	1.36	0.175	-0.0047194	0.025964
nirlend	-0.0003439	0.0002094	-1.64	0.101	-0.0007543	0.0000665
lnifit(-1)	-0.0059096	0.0023216	-2.55	0.011	-0.0104598	-0.0013594
Cons	0.3867427	0.1117279	3.46	0.001	0.16776	0.6057253

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(1007) = 1201.97

Prob > chi2 = 0.2100

AR(2) -1.22 (0.220)

Source: Own elaboration from the research data

It should be noted that the result of the real exchange rate reinforces the arguments that consider it an instrument capable of inducing a successful process of industrialization, especially for developing countries. As examples, Rodrik (2008) and Rapetti, Skott and Razmi (2012) show the important role of exchange rate policy or the exchange rate as an instrument to induce structural change toward more technologically sophisticated productive sectors, and consequently, toward a diversification and greater dynamism of exports. In particular, Rodrik (2008) finds two empirical regularities. First, a devaluation of the exchange rate has a direct positive effect on the relative size of the tradable goods sector, especially those related to industrial activities. Second, the effects of the real exchange rate on growth operate, at least in part, through changes associated with the relative size of the tradable goods sector.

⁷ See, among others, Kose et al. (2009), Prasad et al. (2007), Rodrik and Subramanian (2009) and Jeanne, Subramanian and Williamson (2012).

In other words, countries in which devaluation induces a resource allocation to the tradable goods sector – especially to industrial activities – grow faster.

On the other hand, the proxy variables for relocation and degree of openness were not significant. In the case of relocation, the result is not surprising, since the relocation process is not a significant feature of developing economies in general, nor do these economies present significant volumes of foreign direct investment relative to advanced economies.

Given that the degree of openness was not significant, as well as the hypothesis previously raised that the countries which benefit from trade liberalization are those with a consolidated industrial sector and a trade surplus in the manufacturing sector, this issue was investigated by dividing the total group of countries in the research into two sub-samples according to the existence of a trade deficit or surplus in the manufacturing sector. Since information for this variable was not available for many economies in the 1970s, the two groups were separated starting from 1980. The criterion for defining surplus and deficit countries was the average of the trade balance observed in the first five years of each period analyzed, subject to the availability of data.⁸ Considering also that the 1990s represents a period of significant deepening of the process of trade globalization, often distinguished as the beginning of the era of “hyperglobalization”,⁹ the model was estimated again using this period as the starting point, following the same criteria defined above.

Table 4 shows the results of the estimation of equation (1) for the countries with a trade surplus in the manufacturing sector, according to the aforementioned periods.

Table 4 – Determinants of manufacturing in surplus countries, dependent variable d.lnvaman

1980-2017	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
lnvaman(-1)	0.9583747	0.0228455	41.95	0.000	0.9135983	1.003151
lnvaprim	-0.0953723	0.0301307	-3.17	0.002	-0.1544275	-0.0363172
lngdppc(-1)	-0.1707074	0.038238	-4.46	0.000	-0.2456526	-0.0957623
lnrer	-0.018149	0.0190277	-0.95	0.340	-0.0554426	0.0191447
fdigdp(-1)	-0.0014497	0.0007537	-1.92	0.054	-0.002927	0.0000275
lnopen	0.0668227	0.0185128	3.61	0.000	0.0305383	0.103107
nirlend	-0.0003269	0.0004414	-0.74	0.459	-0.0011919	0.0005382
lnifit(-1)	0.0005687	0.0067466	0.08	0.933	-0.0126543	0.0137918
Cons	1.653905	0.3714919	4.45	0.000	0.9257939	2.382015

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(133) = 121.904

Prob > chi2 = 0.7451

AR(2) -1.17 (0.20)

1990-2017	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
lnvaman(-1)	0.9512914	0.0228935	41.55	0.000	0.9064209	0.9961619
lnvaprim	-0.0917535	0.030145	-3.04	0.002	-0.1508366	-0.0326703
lngdppc(-1)	-0.1201955	0.0293599	-4.09	0.000	-0.1777399	-0.0626512
lnrer	-0.0038088	0.0173465	0.22	0.826	-0.0378073	0.0301897
fdigdp(-1)	-0.0018409	0.000738	-2.49	0.013	-0.0032873	-0.0003945
lnopen	0.0556027	0.0164937	3.37	0.001	0.0232757	0.0879297
nirlend	-0.0002603	0.0004276	-0.61	0.543	-0.0010984	0.0005778
lnifit(-1)	0.0027983	0.0063243	0.44	0.658	-0.0095971	0.0151938

⁸ For example, if for a given country there were no data for 1980, the average was calculated for the period 1981-84. In the absence of any data for the first five years of the 1980s, the country was excluded from the sample.

⁹ See, for example, Subramanian and Kessler (2013) and De Feis, Grunewald and De Feis (2016).

Cons	1.190187	0.2843412	4.19	0.000	0.6328886	1.747486
Sargan test of overidentifying restrictions						
H0: overidentifying restrictions are valid						
chi2(152) = 141.6802						
Prob > chi2 = 0.7148						
AR(2) -1.15 (0.190)						

Source: Own elaboration from the research data. For the country samples in the groups, see the appendix (Box 3).

It should be noted that the results for the degree of openness are particularly interesting. In both the period 1980-2017 and the interval 1990-2017, the significance of this variable and its positive sign confirms the hypothesis that for countries that have already had a certain degree of competitive advantage in the manufacturing sector (expressed in their surplus with the rest of the world), greater trade openness would have had a generally beneficial effect on the added value of the sector and therefore on the industrial development of those economies. The remaining variables maintain the expected sign, as well as the statistical significance, except the financial integration variable, that is no longer significant.

Finally, Table 5 presents the results of the same model of equation (1) but now applied to the countries that presented deficits in the trade of manufactures at the beginning of each period analyzed. It can be observed that, for countries with a trade deficit in manufactures, the degree of openness of the economies were negative in the 1980s but no longer significant in terms of their effects on the relative share of value added of the manufacturing industry in the 1990s. No significance in this case may be associated with the greater heterogeneity observed in the deficit group, since several countries, particularly the Asian ones, managed to overcome the initial disadvantages and become surplus countries, while others experienced an even greater deterioration in the manufacturing sector's trade balance.

Table 5 – Determinants of manufacturing in deficit countries, dependent variable d.Invaman

1980-2017	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Invaman(-1)	0.9024891	0.0130958	68.91	0.000	0.8768218	0.9281564
Invaprim	-0.030686	0.0091572	-3.35	0.001	-0.0486338	-0.0127383
lngdppc(-1)	-0.017439	0.0106858	-1.63	0.103	-0.0383828	0.0035048
lnrer	0.0228612	0.0072721	3.14	0.002	0.0086082	0.0371142
fdigdp(-1)	-0.0001126	0.0003596	-0.31	0.754	-0.0008174	0.0005921
lnopen	-0.0001835	0.0000819	-2.24	0.025	-0.000344	-0.0000229
nirlend	0.0000368	0.0000442	0.83	0.405	-0.0000498	0.0001235
lnifit(-1)	-0.0027144	0.0021886	-1.24	0.215	-0.007004	0.0015752
Cons	0.4863958	0.1114043	4.37	0.000	0.2680474	0.7047441
Sargan test of overidentifying restrictions						
H0: overidentifying restrictions are valid						
chi2(602) = 728.2093						
Prob > chi2 = 0.300						
AR(2) -1.03 (0.160)						
1990-2017	Coef	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Invaman(-1)	0.8337267	0.021038	39.63	0.000	0.7924929	0.8749605
Invaprim	-0.0386136	0.020206	-1.91	0.056	-0.0782167	0.0009895
lngdppc(-1)	-0.0516082	0.0179447	-2.88	0.004	-0.0867792	-0.0164372
lnrer	0.025928	0.0110637	2.34	0.019	0.0042436	0.0476124
fdigdp(-1)	-0.000047	0.0000588	-0.80	0.424	-0.0001623	0.0000682
lnopen	-0.0001763	0.0001234	-1.43	0.153	-0.0004182	0.0000655
nirlend	-0.0006227	0.0002406	-2.59	0.010	-0.0010942	-0.0001512

lnifit(-1)	-0.0004291	0.0002556	-1.67	0.093	-0.0009307	0.00000712
Cons	1.029906	0.1932851	5.33	0.000	0.6510744	1.408738

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(345) = 490.6454

Prob > chi2 = 0.110

AR(2) -1.50 (0.280)

Source: Own elaboration from the research data.

In any case, the result for the surplus economies confirms the hypothesis that trade liberalization had different effects on the economies, reinforcing the comparative advantages in the production of manufactured goods in this group of countries, whereas the effects are not clear for the deficit group. It should be highlighted that for the deficit group of countries, the exchange rate becomes a positive and significant variable to explain the trajectory of industry, being (as discussed previously) an important instrument of industrial and foreign trade policy, in view of the lower competitiveness of its manufacturing sector vis-à-vis the group of surplus countries.

In addition to the exchange rate, for the deficit group it should also be highlighted that the value added of the agricultural sector, representing a primarization of production, and the degree of financial integration at the second regression were both significant and contributed negatively to the performance of the manufacturing sector. The results for the deficit countries are more aligned with those obtained for the developing countries, reflecting the greater representativeness of these countries in the sample.

Considering that the estimates greatly depend on the validity of the instruments used to identify the endogenous variables, it is worth noting that the Sargan test was performed to check the validity of the instruments used in each of the four models. Failure to reject the null hypothesis indicates that the instruments used are robust. Therefore, the tests for the models indicated that the restrictions used are valid.

The serial autocorrelation test examined the hypothesis that the error term is not serially correlated. More specifically, it was tested whether the differentiated error term is serially correlated in second order (by construction, the differential error term is, probably, serially correlated in first order, even if the original error term is not). The tests indicated that the null hypothesis of non-existence of second order serial correlation in the differentiated error term in the four models estimated cannot be rejected.

5. Final Considerations

The present paper has analyzed deindustrialization as a set of processes, investigating its main determinants in developed and developing economies, during the time interval 1980-2017. In line with our chosen theoretical framework, the centrality of the manufacturing sector for economic growth was discussed, underlining how the occurrence of deindustrialization in the last decades took place. This was observed as a fall in the value added share of the manufacturing sector in total value added at the same time as a fall in the employment share in relation to total employment in the various economies.

Deindustrialization, characteristic of most economies in the last decades, has manifold and complex causes, linked to several distinct factors. It may be a natural consequence of the very process of economic development, but its factors are rooted in other sources, namely (i) the behavior of variables linked to macroeconomic policy/stability (such as interest rates and exchange rates) and to trade and financial openness/integration; (ii) the occurrence of the so-called Dutch disease type of phenomenon; (iii) industrial relocation, with firms' production migrating from advanced economies to developing countries; and (iv) financialization of the economy to the detriment of the real sector.

In order to test these arguments, the empirical part of our research used the estimation of a panel data for 61 countries and the time interval 1980 to 2017. Explanatory variables were sought to reflect the main sources of deindustrialization as they are discussed in the literature, especially in the context of growing economic globalization.

Our results show that for developed and developing economies the increase in both per capita GDP and the degree of financial integration are good explanatory factor candidates of deindustrialization. The relevance of other variables, in contrast, appears to be dependent on the level of economic development. For the less developed economies, exchange rates and primarization play a prominent role. In advanced economies, it is relocation of production that seems to stand out, reflecting firms' strategies to capitalize gains on relative prices (mostly factor prices and labor wages) and access new expanding markets. As anticipated, it does not seem that the degree of trade openness proves to be such a key variable: its role is at least ambiguous, benefiting those countries already more competitive in manufacturing in world trade. Contrary to the implications of the literature, it does not seem to exert any major effect on countries less competitive in manufacturing.

Basically, the contribution of this paper is twofold. On the one hand, we have reviewed a vast literature on deindustrialization, in both developed and developing countries. On the other, we have shown (or tried to show with the available data) that, while there is an almost universally accepted definition of deindustrialization (trivially measured in terms of value added and/or in employment shares of the industrial sector), there is, in fact, a more interesting set of diverse processes behind deindustrialization. The diversity runs so deep that one begins to wonder whether the naming itself (and the related measuring sticks) makes sense. In any case, it calls for a closer look at each process or each "family of processes" of deindustrialization, accepting the idea that a family of processes is a parameterized set of similar dynamics, with distinct parameter values.

This paper has actually focused first of all on what could be considered the determining factors of deindustrialization, common to both developed and developing countries, without questioning the standard definition(s) or the related various explanations. We then carried out an empirical exercise. So, in the end, even though we had started with a rugged landscape (a "panel") of diverse countries and had gone through checking for relevant variables shared by all, we discovered that, in reality, it is the very definition that, being so *coarse*, allowed us to find common variables. In other words, by taking a more interesting closer look, we encountered *models of deindustrialization*, on which, at this moment in our investigation, we can only speculate.

However, there does seem to be at least two models. Again by model here, we mean a parameterized family of processes "alike" to one another in some sense, perhaps in their *mechanics*. One such family is deindustrialization as a reversion to primary production, most possibly at early or not yet mature stages of technological development. While, here too, we have a reduction of industry's share in value added and/or employment, the causes are different and they may also vary from country to country, though most of them, if not all, are developing countries. This is the case in point with countries of Latin America. Brazil, for example, in the new global market place and production chain, found itself locked out of the "factories of the world". China is another case in point. Possibly premature deindustrialization in the words of Palma (2005, 2008, 2010) and Rodrick (2008, 2016) takes place. Or it is often a Dutch disease that takes place and contributes to explaining the mechanics.

The alternative model is the delocalization model, through which many regions and/or national economies find exporting production profitable, but retain design, architecture and whatever most contributes to value added. This same model can generate coexisting, contradictory effects in certain places. That is, one region of the USA (say California or Wyoming) is earning fat rents from their *idea factories*, while *vile physical production* is elsewhere. Elsewhere in the same country, the *rust belt* is suffering, among many other reasons, at the same time from the same delocalization process.

All in all, this shows that we need to take a closer look at the social costs of delocalization in developed countries. But also a closer look at how deindustrialization is taking place in developing countries: with a leopard spotlike pattern, inducing a local cluster to arise around delocalized industries from abroad, or as a generalized maquiladora. Mexico is probably the country that most clearly has both of them. Could this be the reason for the recent negative attention given to it?

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APPENDIX

Table 2 -Variable list, methodology and construction

Name code	Remark	Source
<i>vaman</i>	Added value of the manufacturing sector in relation to total value added. Refers to the code D of ISIC Rev. 3. Values in US\$ of 2005.	UNSD and GGDC 10-Sector Database (to Taiwan and Ethiopia).
<i>vaprim</i>	Added value of agriculture and livestock in relation to total value added. . Refers to the codes A-B of ISIC Rev. 3. Values in US\$ of 2005.	UNSD and GGDC 10-Sector Database.
<i>gdppc</i>	Gross Domestic Product per capita (PPP, 2011 international US\$)	<i>WEO</i> -IMF.
<i>rer</i>	Real interest rate, adjusted by purchasing power parity.	Penn World Table 9.0 and <i>IFS-WEO</i> -IMF
<i>nirlend</i>	Interest rate, represented by the nominal lending rate (%).	<i>IFS</i> -IMF.
<i>fdigdp</i>	Direct investment, net acquisitions abroad, as % of GDP	<i>IFS</i> -IMF.
<i>ifift</i>	Proxy for de facto financial integration (and financialization). Module sum of inflows and outflows of capital, in % of the trade flows.	<i>IFS</i> -IMF.
<i>open</i>	Proxy for commercial opening. Sum of the value of exports and imports as % of GDP.	<i>WDI</i> -World Bank
<i>GDP</i>	Gross Domestic Product at current US\$.	<i>WDI</i> -World Bank
Trade balance in manufactured goods	Calculated based on codes 5-8 of SITC Rev. 3.	UN Comtrade.

Table 3– Country list of the survey

Developed countries	Developing countries		
Denmark	Albania ^a	Hong Kong ^b	Republic of Macedonia ^a
France	Argentina	India	Republic of Moldova ^a
Germany	Armenia ^a	Indonesia	Russian Federation ^a
Italy	Azerbaijan ^a	Jordan	Saudi Arabia
Japan	Bahrein	Kazakhstan ^a	Senegal
Spain	Bangladesh	Kenya	Singapore
Sweden	Belarus ^a	Kyrgyzstan ^a	South Africa
The Netherlands	Bolivia	Malawi	Sri Lanka
The United Kingdom	Botswana	Malaysia	Syrian Arab Republic
The United States of America	Brazil	Mauritius	Taiwan
	Chile	Mexico	Tanzania
	China	Morocco	Thailand
	Colombia		Turkey
	Costa Rica	Nigeria	Ukraine ^a
	Egypt	Pakistan	Venezuela
	Ethiopia	Peru	Zambia
	Georgia ^a	Philippines	
	Ghana	Republic of Korea	

Note: The classification of countries follows the United Nations Department of Economic and Social Affairs (UN/DESA), but includes transitions economies in the group of developing countries. ^aTransition economies. ^bSpecial administrative region of China.

Table 8 – Samples of countries with manufacturing surplus and deficit at the outset of each period

Surplus		Deficit			
1980-2015	1990-2015	1980-2015		1990-2015	
France	Germany	Denmark	Malawi	Denmark	Kenya
Germany	Italy	Netherlands	Malaysia	France	Macedonia
Italy	Japan	United Kingdom	Mexico	Netherlands	Malawi
Japan	Sweden	USA	Morocco	Spain	Malaysia
Spain	Argentina	Bahrein	Nigeria	USA	Mauritius
Sweden	Brazil	Bangladesh	Pakistan	United Kingdom	Mexico
Argentina	Hong Kong	Bolivia	Peru	Saudi Arabia	Moldova
Brazil	India	Chile	Philippines	Bahrein	Morocco
Hong Kong	Korea	China	Saudi Arabia	Bangladesh	Nigeria
Korea		Colombia	Senegal	Bolivia	Pakistan
		Costa Rica	Singapore	Chile	Peru
		Egypt	Syrian	China	Philippines
		Ghana	Sri Lanka	Colombia	Senegal
		India	Tanzania	Costa Rica	Singapore
		Indonesia	Thailand	Egypt	Sri Lanka
		Jordan	Turkey	Ethiopia	Syrian A. R.
		Kenya	Venezuela	Ghana	Thailand
				Indonesia	Turkey
				Jordan	Venezuela