

## The Uniqueness of the Deindustrialisation Process in Mexico, (1990-2023)

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### Abstract

The research verifies that a re-specialisation of the economy away from manufactures towards extractive or service activities is underway in Latin America and, by electing Mexico within a sample of countries, highlights its contrasting generative features of deindustrialisation off the average pattern followed by the others during the 1994-2023 period. It is reported as follows. First introduces the issue of deindustrialisation and why it matters. Second examines the Mexico's distinctive experience of deindustrialisation. Third sets out the basics of deindustrialisation. Fourth attempts to quantify the factors responsible for the decline of the manufacturing employment and product shares in the countries sampled. Fifth analyses and discusses the results obtained and concludes that the Mexican economy has had a premature deindustrialisation, i.e. at lower levels of per-capita GDP but not throughout out the sector nor neither moving away from industries into primary or services sectors as it has been the standard by the other economies surveyed. Sixth delineates a targeted strategy to level up the performance as of the traditional as the advanced segments of the manufacturing subsector whilst strengthening productivity, skills digitalization and technology throughout the industrial sector. And, seventh concludes that the new industrial strategy needed must overcome the stagnant output situation in the traditional industry, ensure positive externalities from modern industry permeate the whole industrial sector.

**Key Words:** deindustrialisation, reindustrialisation, industrial policy, manufacturing subsector, nearshoring.

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### 1. Overview

Over the last three decades the manufacturing subsector has declined in developed economies (DEs) and less developed countries (LDCs) alike. This phenomenon of deindustrialization is usually evidenced through the contraction of manufacturing output and employment levels.<sup>2</sup>

Some explanations offered for deindustrialisation include that the own LDCs governments are to be blamed as “tend to hamper the industry by excessive regulation and by trying to fix exchange rates...” (Crafts 1993), while others consider respond to expeditious structural reforms, in specific those of free-trade advocacy and financial liberalization nature, which prematurely exposed LDCs economies to an intense international competition. Recently, however, other analysts (e.g. Imbs, 2013) have focussed the lack of the right economic policies and the institutional framework weaknesses prevailing as the factors catalysing deindustrialisation.

The importance of manufacturing industry, however, remains vital to any thriving economy because a great deal of the innovation and productivity growth originates in that subsector.<sup>3</sup> So, the consensus revolves around that the government should positively promote manufacturing and related industrial activities (Singh, 1987, Rodrik 2022), if necessary by trade protection and helping manufacturers by subsidies for investment,

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<sup>2</sup>The share of world or regional manufactured exports and the percentage change of the value added from the manufacturing sub-sector are other good indicators of deindustrialisation of any single nation or club of countries.

<sup>3</sup>At an analytical level, the phenomenon of deindustrialisation raises two central issues. Firstly, why should some industries fall? Or more interestingly, why should the manufacturing sector as a whole decline absolutely or in terms of its share of Gross Domestic Product (GDP)? and secondly, does deindustrialization matter?

nurturing “infant industries”, proscription of short-termism vision, and to strengthen human capital formation, let alone correction of any market failure but ensuring that the disciplines of competition is retained and that should be an industrial policy explicit purpose.

Hence, the reindustrialization agenda remains a subject of great interest in LDCs like Mexico not only for still being weighed as an effective way to catapult any developing economy but also to reduce deindustrialisation. The need of a supportive long-run strategy has been long awaited in Mexico. In 2019, the governmental industrial strategy unveiled was meant to be the definitive blueprint towards a growth and development. However, the complex strategy put forward amounted to be a good start at its best, but much remains to be done to ensure success.

It was right proposing several levers to the right direction, however, details about targeting them were not clearly specified. Among those pointing out to close persistent productivity gap at a minimum with competitor nations associated to USMCA - the tripartite trade deal between the US, Mexico and Canada, by boosting productivity growth in non-durable industrial subsector in the first stage and encouraging investment. Furthermore, the itched of old and new funding programmes lined up with myriad government initiatives has been confusing. The funding initiatives are microscopic compared to the challenges size. The plan for unlocking private investment was pitiful and persist as such, too.

Regarding, on the one hand, the vital role of manufacturing industry to any thriving economy due to the kind of products made, but also the value added created and, on the other hand, that deindustrialization is a structural unbalance with malignant overall consequences, this research assess the causes of premature deindustrialisation in the lights of the new growth economics literature which offers some new theoretical insights to support proposals for a return to governmental intervention to pursue growth through a policy of promoting manufacturing as this ensure the achievement of rapid and sustained economic growth in LDCs, i.e. a feature that it turns to be a real Achilles heel of Mexico and elsewhere in Latin America. In that endeavour, policies which might improve medium term growth prospects are pondered. Additionally, this research aims to provide some mitigating elements of the industrial policy suitable to reverse deindustrialisation and turning it in a veritable reindustrialisation process.

In this research, the conjecture held is that given the peculiarities of the deindustrialisation process in Mexico whose salient feature are both their spreading beyond modern industry towards over traditional industrial branches, and the long-term macro structural unbalances caused, industrial growth can only be achieved with a very well targeted industrial strategy but with a strong regional dimension and relaxing some major institutional parameters which now constrain economic policy. Implicitly, the hypothesis holds the proposition that future growth prospects are much weakened by the recent shrinkage of industrial product, particularly in the 1980s and 1990s precipitated by the outward-looking political economics installed and exacerbated for the way they were implemented, let alone governmental monitoring failures.

## 2. Stylized facts

Led by a process of rapidly expanding exports and a medium-term improvement in the global terms of trade of primary goods, Latin America witnessed an unexpected surge of growth in the 2003-2013 period. This process was related to the emergence of China as a new industrial hub and formidable guzzler of agricultural products, minerals, cooper, and other raw material in the world economy (Garcia-Paez, 2018).

While dynamism of the Chinese economy and that of the world demand for raw materials were robust, together generated many favourable short-term effects on the economy growth of Latin America countries whose “medium-term and longer-term developmental consequence which depended on the tradeable good sectors” (Ros, 2013). However, with the 2008-2009 economic recession first and economic slowdown of China economy afterwards, the super-cycle of raw material export boom ends up irreversibly. So, the short-lived excitement over the prospect of rapid catching up with the advanced economies rapidly vanished and thus Latin America have had to take a sharp turn since.

In tracking the 1990s pattern of structural change in Latin America and the ensuing re-specialization of countries like Mexico,<sup>4</sup> a primary sensor of deindustrialization is the concentration index of Herfindahl index (Imbs and Wacziarg, 2003):<sup>5</sup>

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<sup>4</sup> “Structural diversification is a major change in a country’s economy that involves extending economic activities into different fields. This may involve the reform or creation of new economic institutions.” World Bank Group, 2010.

$$HHI_t = \sum_{s=1}^N \left( \frac{Y_{st}}{\sum_{s=1}^N Y_{st}} \right)^2 \quad \text{Fig 1}$$

In which  $HHI_t$  = Hirshman-Herfindal coefficient index, and  $Y_{st}$  = real production in sector  $s$  at time  $t$ . The  $H_t$  takes high values when the economy is highly specialized, i.e., when the majority of product occur in few sectors and the distribution of output at sector level gets a skewed shape. The structural change happens as  $H_t$  display time trends, rather than the actual level of  $H_t$  assumes. Chart 1 shows the value of  $HHI_t$  which displays the trend of the real product during the 1990-2020 period.

*(Chart 1 about here)*

Chart 1 reports the value of  $H_t$  of the whole economy. The bulk of the 1990-2023 period displays on average a highly specialized pattern. Except for a short spike between 1994 and 1996 Since 1992, the Mexican economy reversed a weak diversification, and it displays an upward specialization at a spectacular rate. Furthermore, re-specialization in Mexico happened in 1992, when the economy was at 3,921 USD - on average at lowest per-capita GDP of the OECD countries. What is striking, the specialization trend burgeoned at a low Manufacturing Added Value of 22 (% of GDP) which, incidentally, descended until 17 (% of GDP) in 2009. Though these empirical observations give credence to the notion that Mexico deindustrialization has been indeed premature, the legitime question about which is the driving force underneath such abrupt specialization in 1995, remain.

For sub-sectoral analysis, the experiment requires recomputing the Hirshman-Herfindahl's index, generating subsamples for each economic sector whose values are in turn subtracted to the corresponding sectoral GDP value accordingly:

$$IHH_t = \left( \frac{S_1}{PIB - ExS} \right)^2 + \left( \frac{S_2}{PIB - ExS} \right)^2 + \left( \frac{S_3}{PIB - ExS} \right)^2 + \dots + \left( \frac{S_n}{PIB - ExS} \right)^2 \quad \text{Fig 2}$$

Thus, the agricultural subsector is excluded from the primary sector; from the secondary sector two net values are generated: one by omitting manufactures and another by excluding industries of high technology; and from the tertiary sector, commerce and the real estate services are then excluded. So, as the criterion of acceptance of true indicator is to pick subsample that ceases to depict the reversal on the diversification trend in 1992, panel fourth at the right of bottom part of Chart 2 is eloquent. It displays an opposite trend of the diversification reversed and renders a new pattern of re-specialization in favor of the services sector and away from the industrial sector, or more precisely, detrimental to the manufacturing subsector.

*(Chart 2 about here)*

To move onto verifying the empirical support of the occurrence of a premature deindustrialization process in Mexico and other selected countries to whom the former is compared, another stance is that they all experienced a specialization phase by extracting activities during the 1970s, then pass into another phase of diversification by absorbing the economic rent obtained in the 1980s and suffered again a far-reaching re-specialization episode from mid 1990s as the latter was prevalent in traded sectors. This is suggestive that trade, both regional and global, also explains the Latin America's structural change whose essence could be hint as a Dutch-Disease kind.<sup>5</sup>

This feature appears to be arose primarily from the real exchange rate effects of the natural resource boom given the robust capital inflows, and later going through negative implications for the long-run growth of the resulting contraction of industrial output, investment, and unemployment. As expected, these implications are negative to the extent that economic development is associated with the growth of modern tradable goods sectors operating under the increasing returns to scale and the expansion of these activities generates endogenous productivity growth, within these activities and elsewhere in the economy, due to the presence of internal economies of scale as well as positive external effects such as learning by doing externalities. The overall result seems to have been a generalized process of deindustrialization in the Latin America. As shown in table 1, along

<sup>5</sup> Some authors (Imbs and Wacziarg, 2003, e.g.) studies the evolution of sectoral concentration in relation to the level of per capita income and found that various measures of such phenomenon follow the U-shaped pattern across a wide variety of data sources: countries first diversify, but there exists, relatively late in the development process, a point at which they start specializing again. This explains why they depicted it as a monotonic relationship between income and diversification

<sup>6</sup> The Dutch disease syndrome included both indirect ways through a substantial appreciation of the real exchange rates caused by the spending effect leading to a decline in the profitability of the industrial sector in the major economies of Latin America countries, and direct ways such as the inter-sectoral capital mobility.

the study period all the major exporters of manufactures, except Mexico, suffered from a sharp fall in the share of manufacturing in GDP.

*(Table 1 about here)*

As Ros (2013) noticed, in today's world, increasingly intensive in capital and technology, natural resources not only have ceased to play a significant positive role, but some analysts have argued that their relationship to differences in income and growth is being progressively reversal, let alone the negative implications in the fundamentals of the primary goods producers. Table 1 also reveals that Mexico's rate of deindustrialization is comparatively discrepant with the rest in the selected sample of regional economies, showing the uniqueness of its deindustrialization as it appears to be confined to some part of its manufacturing base and not to the industrial sector in its entirety.

Even when now Mexico is no longer a significant raw-materials exporter, the rising of the price-index of commodities constituted a blessing event for the Mexican economy as allowed it to bask in the so-called raw-materials super cycle thus benefiting from both, being a member country of the North-American Free Trade Agreement (NAFTA) and on becoming a source for goods procurement of the bonanza enjoying the major South-American economies 2003-2013 period, so temporarily relaxing Mexico's longstanding fiscal, savings and foreign exchange gapping constraints. Notwithstanding, Mexico was unable to bridge the gap between the so-called two "Mexico": on the one hand, the North close to the US border nesting the best-performing Mexican states and the South towards the Central America, where the lagging federal entities are located, and high levels of poverty is rife.

As asserted by the OECD (2017), "Ambitious structural reforms and sound macroeconomic policies have ensured the resilience of the highly open Mexican economy in the face of challenging global conditions. Mexico's productivity growth has recently picked up in sectors that benefitted from structural reforms –trade openness, foreign direct investment, integration into global value chains and innovation incentives have boosted exports... Yet other sectors lag, suffering from overly stringent local regulations, weak legal institutions, rooted informality, corruption, and insufficient financial development," ... "growth has not been inclusive enough to achieve better living conditions for many Mexican families".

## 2.1 Case study: The Mexican economy

Eighty years ago, Latin-America missed out the opportunity to reshape its economies and societies, with the growth of the 1940s giving way to the inflation and balance-of-payments crises from the 1950s to 1970s, and then to the so-called lost decade of the 1980s (Diaz-Alejandro, 1982, and Winter, 2023). However, as Diaz-Alejandro (1982) added the succession of global crises also brought opportunities to Latin America too. In the beginning, the supply difficulties caused by WWII spurred the production of domestic substitutes, and the absence of foreign capital forced countries to adopt bolder and more innovative economic policies whose result was that growth outpaced the rest of the world, enabling Latin America to recover quickly from the troubles of the Great Depression. Later, the region benefited from high prices for the commodities it exports, and the green transition could still make those same commodities increasingly valuable in the current new commodity Supercycle.<sup>7</sup> Recently, its relative closeness to the massive North American market and a favourable foreign trading circumstances have brought the best chance for a generation: the ongoing nearshoring phenomenon taking place just beside the north border between Mexico and the US.

On the positive side, Latin America today commands fresh attention because of its potential to help meet some of the 21st century's biggest challenges: producing food, generating clean energy from sun and wind, extracting critical minerals -for instance, lithium and copper; accounting for 45% of global agrifood trade, and its abundant stock of farmland and abundant water supplies. Furthermore, it has the minerals and rare earths, extraordinary biodiversity, and ability to fight climate change as its best economic opportunities<sup>8</sup>, and is home to the world's largest surviving rainforest. This pool of strengths just gives Latin America its dreamed chance to lift its economies out of stagnation, make its people wealthier, and to assume a bigger global role.

On the negative part, however, the region has disappointed their people over the past decade. Its economies have barely grown and living standards have mostly stagnated or declined. Despite opportunities, the investments may not materialize – at least not in the volume needed to make a lasting difference and there is still

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<sup>7</sup> It's pertinent adding up that the own regional governments are to be blame for wasting the opportunity to industrialise natural resources as they restrained themselves going beyond the exhausted Import Substitution Industrialisation strategy (Palma, 2020).

<sup>8</sup> This is what might be described as the next "unbundling": people providing services abroad without having to leave home.

the risk that they could configurate sort of enclaves, thus with limited economy-wide impact. The institutional framework doesn't help neither. Latin America's private sector is failing the region as prevail a 'parasitic' relationship between business and state amounting to a "massive private sector problem" with companies that profit from an excessively cozy relationship with government but fail to invest enough. companies in the region invested too little in research and development. "They have benefited from massive rents and subsidies, whether it's natural resource rents or protectionism or nepotism" as Mazzucato (2022) asserts.

Nearshoring emerged owing to the wary of China which prompted the US the hunting for reliable alternatives nearer home to locate low-cost factories. Across the border lies Mexico, a land of low-cost labour and abundant possibility, with preferential trade access and tax breaks under the current administration's green energy programme. Beyond geographic proximity to the US of Mexico, it counts also its membership in the USMCA deal, its undergone metamorphosis in the region's main manufacturing hub at the North border which allow it to stand out as the relocation for excellence by hosting companies besides the US market. Additionally, Mexico has some strengths of its own such as its economy accounted for almost a quarter of Latin America and the Caribbean's combined GDP in 2023 and managed to attract 17% of total flows of Foreign Direct Investment (FDI) into the region.

Due to the aforementioned factors, in theory, Mexico ought to be a nearshoring winner. However, even though Mexico is already benefiting from the arrival of firms it might limit this opportunity because of its poor planning and ageing infrastructure so putting a ceiling on Mexico's economic legitim pretensions. Unresolved national structural problems — such as the lack of competition in the economy make to doubt that the external forces per se will be transformative for Mexico. A warning issue is offered by the facts that Mexico has had trade agreements with the US and Canada for nearly 40 years, and productivity and wider GDP has expanded at a modest average of 2%. To date, the Mexican government has not formulated a modern industrial plan nor galvanised a comprehensive strategy to attract FDI.

In July 2023 Mexico overtook China as the biggest source of imports into the US.<sup>9</sup> FDI into Mexico hit a record \$32.9bn in the first nine months of this year. Industrial parks near the American border are filling up. Moving US manufacturing to Mexico is nothing new. The process began with the NAFTA in 1994,<sup>10</sup> which spurred a wave of investment into assembling cars, trucks, and televisions. Mexico's exports to the US were above those of China in the 1990s but lost the supremacy as Chinese imports rocketed. As suggested already, that change owes more to sharply declining Chinese imports than to booming Mexican exports.

Despite such drawback, Mexico's figures seem are improving as nearshoring gains more traction and investors. But it seems that isn't reaping the potential gains as restricting foreign companies investing in renewable energy and promoted state-generated electricity instead, which comes mainly from fossil fuels, has had as a result is a shortage of the green electricity vital to attract new factories. Water shortages are another constraint. However, Mexico should make the most of this scarce chance to win nearshoring business.<sup>11</sup>

The same caveats to Mexico apply for the entire region. Trade between Latin-American countries is now so low. It languishes at about 20% of the region's total trade, compared to nearly 50% in east Asia. What should be a golden opportunity if risks being wasted. It is not easy to assemble a chain of suppliers from countries to trade components. Other regions collaborate more effectively. Alejandro Werner (2022) recalled how during his time as a senior International-Monetary-Fund official during the pandemic "the African delegations would present a specific list of joint requests, while Latin America never had a common position".

### 3. Economic Theory and Industrialisation Strategy

As development sets out, the share of agricultural in total employment falls and there is correlatively a rapid expansion of the share of manufacturing. This process is known as "industrialisation". Notwithstanding, the share of manufacturing reach a plateau before declining suddenly. However, the share of services in national employment which had accompanied the expansion of the manufacturing sector, acquired its own dynamics and then increased its participation. By analogy with the preceding phase, this falling share of manufacturing is

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<sup>9</sup> This is not taken at face value. That was a result of tensions between China and the United States rather than a Mexico's trading policy.

<sup>10</sup> Incidentally, the NAFTA couldn't frustrate the reverse catching-up of the USA with Mexico in terms of market inequality despite the deal's expectations but in the opposite direction. (Palma, 2020).

<sup>11</sup> As for that expectations come true, it needs to learn what policies are needed in principle. Mexico cannot go largely squandering these scarce opportunities. With better government policy, the economy could boom.

described as “deindustrialisation”. If total employment is growing fast enough, then the relative share of manufacturing may decline even though the absolute number of people working in this sector rises.<sup>12</sup>

A variety of reasons have been put forward to explain why the employment share of manufacturing should fall. These include the following (Rowthorn & Coutts, (2013): a) *Classification* by the shifting classification of manufacturing goods, b) *Consumption* as monetary incomes rise in poorer countries during industrialisation, the proportion of expenditure devoted to food declines, and consumers purchase more manufactured goods - - Engel’s Law, c) *International Trade* as the payment for manufactured imports any country may export other types of manufactured goods or items such as food or services, it may use its income from foreign investments, or it may borrow, d) *Investment* as an increase in the rate of Investment will therefore increase the share of imported manufactured goods in total demand, and thereby rise the share of manufacturing and real output and employment, and e) *Labour productivity* as the output in two sectors is increasing at the same rate, the sector with the faster productivity growth will have the slower employment growth, and vice-versa. The employment share of the most dynamic sector will decline (Mattos & Fevereiro, 2014).<sup>13</sup>

By virtue of that the employment share of manufacturing in the advanced economies dropped by 8.7% in 1970-1994 period, Rowthorn and Ramaswamy (1999) intended to evaluate some of the above effects. They estimated that about four-fifths of this decline was due to internal factors such as productivity growth and changing expenditure patterns and about one fifth to foreign trade with low wages economies, and that for every 4.4 manufacturing jobs that were lost thorough competition from imports from low wage countries, there was on average one new manufacturing job created through the exports of more sophisticated manufactured goods to these countries.

Rowthorn and Coutts (2013) replied the previous econometric analyses working out a panel of 23 countries for 1962-2008 period. Their regression analysis is based on an equation of the following general form:

$$\text{EMPSHARE} = a_0 + a_1 \text{Log}_e Y + a_2 (\text{Log}_e Y)^2 + a_3 (\text{FIXCAP}) + a_4 (\text{MANTRADEBAL}) + a_5 (\text{OPENNESS}) + \varepsilon$$

Where: **EMPSHARE** = share of manufacturing in civil employment; **(Log<sub>e</sub> Y)<sup>2</sup>** = per capita income; **FIXCAP** = Gross domestic fixed capital formation expressed as a percentage of GDP at current market;<sup>14</sup> **(MANTRADEBAL)** = the overall trade balance in manufacturing goods (total exports minus total imports)<sup>15</sup>; **OPENNESS** = manufactured exports plus imports is included to see whether in greater openness to foreign trade leads to higher relative labour productivity in manufacturing, and hence less unemployment, in the manufacturing sector; and finally **ε** = the error term.

Rowthorn and Coutts (2013) found that there was strong evidence of a hum-shaped relationship between manufacturing employment and per capita income. The employment share of manufacturing rose in the early stages of economic development and declined at high levels of per capita income. The coefficient of openness was negative and statistically significant, suggesting that more open economies had higher productivity, and therefore less employment in manufacturing. The manufacturing capital investment exerted a positive influence on manufacturing employment. The overall trade balance in manufactures had a significant impact on manufacturing employment, too. The coefficient of MANTRADEBAL was positive and statistically significant in all equations, suggesting that countries with a large trade surplus in manufactures tend to have a larger than average manufacturing sector.

#### 4. Accounting for Deindustrialization

Following the work made by both Rowthorn & Coutts, (2013) and Rowthorn & Coutts (2004), but doing necessary adequacy, a panel of nine of Latin-American economies is brought to the fore to quantify the influence

<sup>12</sup> Employment is not the same than things as production. In many advanced economies manufacturing productivity is increasing rapidly with the result that this subsector is producing more output with fewer workers. So that, deindustrialization in employment terms does not as a rule imply falling production.

<sup>13</sup> Prior to the 2008-2009 crisis, the real output of manufactured goods in the average advanced economy was growing at about the same rate than economy. Thus, the growth rate of output per worker is equal to the growth rate of output minus the growth rate of employment

<sup>14</sup> The rationale for using this variable is the capital investment in manufacturing intensive, so that an increase in the rate of investment should skew demand toward the manufactured goods. Provided the goods in question are produced at home, this will stimulate level of employment in the domestic manufacturing sector.

<sup>15</sup> It intends to capture the effects of overall trade performance on the structure of unemployment.

of various factors that have contributed to the de-industrialization over the period 1990-2021. The regression analysis is based on an equation of the following form:

$$lva = \beta_0 + \beta_1 ly + \beta_2 lfixcap + \beta_3 empser + \beta_4 expmant \quad \text{Fig 2}$$

Where  $lva$  = the logarithm of manufacturing value added (as % of GDP);  $ly$  = the logarithm of GDP per capita;  $lfixcap$  = the logarithm of investment (as % of DGP);  $empser$  = the level of employment in services sector as percentage of national employment level; and  $expmant$  = percentage of the high and media technology exports of total exports.

Further, the model is run both via the Ordinary Least Square (OLS) and that of aleatory effects and fixed effects methods. As the results still sustain autocorrelation and heteroscedasticity problems, the Hausman, Breusch-Pagan (LM), and Wald tests were applied but without any success at all. So that, given persistence of such estimation problems, alternatively a data panel with corrections of autocorrelation and heteroscedasticity is run as through the Panel-Corrected Standard Errors (PCSE) for the case of fixed effects as the Feasible-Generalized Least Squares (Robust FGLS) for the case of aleatory effects. As the estimation problems remain, estimators remain flawed.

Methodologically that situation called for restructuring the original sample so leaving only countries holding a similar deindustrialization pattern. Thus, Bolivia, Mexico and Panama get excluded as they exhibit discrepant deindustrializing trends in terms of employment and manufacturing added value levels and the experiment must be conducted with the remaining countries in the sample -Brazil, Chile, Colombia, Costa Rica, Ecuador and Perú-, in the 1994-2021 period. So that, disposing the OLS results estimate improved after re-estimating data through the aleatory effects and fixed effects techniques and then contrasting them with the Hausman test. Given the superiority of results of the fixed effect model, it is found that the variables GDP per capita ( $ly$ ) and fixed capita ( $lfixcap$ ), both as percentage of GDP; are statistically significant. Notwithstanding, the  $Ly$  coefficient shows a negative value, -0.1611, indicating that  $Ly$  grows despite the shrinkage of the manufacturing added value. Furthermore, the investment coefficient reaches 0.007, suggesting that fixed gross investment does not have a concomitant impact in increasing the manufacturing the added value.

Overall, the regression results shown in Table 2 (see statistical appendix 1) express that despite all the countries in the sample have much in common, the results obtained show that each economy has followed its own deindustrialization pathway, being the most affected those facing more difficulties to get into the global value chains and then consolidate it eventually. External influences have been less important than internal factors such as productivity growth and shifting patterns of domestic demand.

## 5. Analysis and discussion of results

The problems in fitting data into the set of models tried can be inferred from their own gathering. According to International Labour Organization (2024), the share of the manufacturing subsector in total employment fell back from 22% in 2004 to 16% in 2022. the INEGI added that drop went from 17.04% in 2006-Q3 to 14.83% in 2009-Q3, and afterwards, keeps a positive trend reaching 16.58% in 2020-Q1.

In the Latin American and the Caribbean, it is estimated that the 15.7 million of people in the 10 main occupations. It is considered, however, that occupation level can be shrunken to 4.4 million if the technological innovations take place labour market (ECLAC, 2018). In this sense, it would be necessary to incorporate into de model a digital variable to capture the role that relative intensity technological systems -Internet of Things, Artificial Intelligence, Machine Learning, Blockchain, Robotics and other digital advancements- has been in industry and in particular their impact on the manufacturing subsector which is capital intensive par excellence.

This research coincides with the seminal article on the subject wrote by Salama (2013) in which stated that premature deindustrialization obeys to the government inability to neutralise the effects on inflation and foreign exchange inflicted by, primarily, the accrual of the economic rent generated by the boom of the price index of raw material from which primary-producer countries profit and, secondary, its expenditure. But the appreciation of the value of foreign currency obeys also to other factors such as the massive inflows of foreign financial investment attracted by higher interest rates, i.e., by monetary policy. All these factors could be underpinning deindustrialisation, classic or premature, and tend to dismantle mainly industrial base orientated towards the internal market as they increase the cost of labour per GDP unit expressed in USD, for instance.

However, the “deindustrialisation” process in the wide strip of land besides the border between Mexico and the US, where high-tech transnational firms are located, not only acquires a nebulous essence but also becomes a process difficult to evaluate and manage. Even more, that kind of industrialisation has stopped being its main source or cause of work or income, services sector has taken over.



To date, the results obtained for Mexico does not accord with other countries in the sample. Even more, they do not even allow to arrive at preliminary results. Obviously, if the analytic from the spins-off of ongoing digital revolution is brought forward, they will help not only with more granular data alone, but to interconnect assumptions about economic agents' behaviour with developments in real time, so enabling the capture complexity in the deindustrialisation subject. Should also help to confirm the effectiveness of the type of simple rules, relationships and trend assumptions as the ones deployed in this research. Thus, hopefully confirming heterogeneous deindustrialising process in LDCs.

Recently, renewed claims about the supposedly diminishing significance of manufacturing or the increasing difficulty to pursue economic development by following the conventional path of industrialization, arisen. Inversely, advocates of industrial policy continue postulating that manufacturing is the right strategy to follow forward. For instance, in a study conducted by Nobuya et al. (2016), none evidence is found to support the argument that opportunities for manufacturing development in developing countries are shrinking and that the importance of manufacturing for economic development is wanning, too. To the contrary, they argued that LDCs with the highest growth rate in manufacturing (post-1990) continues to meet the conditions as a driver of acceptable levels of economic development and employment.

So, though manufacturing advocates sustain that it possesses special powers insofar as industry's demands lead technological progress and that the goods it produces must pass the appetite of global markets, which drives up efficiency and as a colophon, this justify tariffs and subsidies to protect manufacturing and boost growth; the problem is that the manufacturing powers seem, casuistically, to have waned lately,

As the Latin America is concerned, in the late 1990s, with the relocation of many industries from Latin America into Asia the waning of manufacturing activities becomes apparent as many regional economies were left in tatters showing that without transnational-companies output, the manufacturing value added, and employment levels dropped abruptly. Likewise, the exposure of their economies revealed that a high degree of the GDP was explained by services sector.

The deindustrialisation of Latin America, or no-industrialisation at all (Noyora, et al., 2016), is often associated with the rising importance of the extractive activities in its economy and which exported to emerging Asia. Thus, contrary to the DEs, Latin America is not categorically moving away from industries to services. Rather is moving back into primary activities, to profit from temporary high commodity prices. This trend has a far-reaching consequence for the region's aggregate activity, which depends on commodity prices.

At the extent that the emergence and deepening of de-industrialization in Latin America is taken place firstly at low substantially lower levels of per capita income than in DCs, and secondly, at lower levels of local of economic diversification, this give credence to the notion that deindustrialisation has been premature indeed.

After the precarious economic situation brought by the long-pursued liberalising reforms invoked by the Washington Consensus whose prototype policies were sober fiscal policies and steady exchange rates, nowadays a variety of developing countries from different regions hold in common many interesting convictions. First, a great determination to transform and diversify their economies, speed-up in the rate of growth, sustain it in the long term, catch up the DCs by 2050 and eventually reaching economic development. Second, a cautious rejection to the typical recipe of liberalising reforms advocated by the multilateral financial institutions since the 1980s before the poor results rendered. Third, embracing manufacturing, even when industrialization in getting more difficult to be induced because of technological advances in which fewer workers than ever are needed to produce any good. And fourth, within manufacturing predilection, they want to leap ahead to cutting-edge one without removing "production-linked incentives" while keeping their strategical natural resources as an inalienable right.

To avoid the risks in seeking to attract high-tech manufacturing and incur again in old-fashioned protectionism such countries are adopting new approaches attracting industries which pursue their natural resources, especially the metals and minerals powering the green transition. So, preserving strategic natural resources and mineral, they are also offering regards of both cash and facilities, enhancing infrastructure such as industrial parks, assigning subsidies to allow new state-owned conglomerates to enter joint ventures with foreign investors. This approach —of trying to scale the energy supply chain— has little precedent on such a scale - leaping to high-tech manufacturing, exploiting the green transition, and reinventing the entrepot- say Juhász, R. et.al (2023).

Several lessons can be drawn so far: a) the state is now much more active in economic development than at any point in time. Somehow an economy must evolve from agrarian poverty to diversified industries that can compete with rivals in countries which have been rich for centuries. To do it, infrastructure, research, and state



expertise are required. It may also demand lending at below market rates. b) the risks involved are high as most countries have sunk enormous sums into pursuing their chosen paths. And c) the way in which countries grow has changed.

So that, it is right to persist in manufacturing provided it has been the only type of work where poor countries have improved their productivity at a faster rate than rich countries, and so caught up. Though in the developmental path LDCs must be aware that cutting -edge industry may not offer the same benefit and, eventually, they must avoid wasting time attempting to make factory processes marginally more efficient when better uses were feasible (Juhász, R. et.al 2023)

It's hard to see how, without the policy interventions a market-driven development model could have produced the extremely high growth rates characteristic of few Latin American countries from 1940 to the early 1980s. So, nowadays many LDCs have adopted industrial policies to accelerate the rate of industrialization and economic growth. If judged from the varieties of growth performance under similar policies, the results have been mixed (Ros, 2013). This have also risen the question about how, and under what conditions industrial policy can significantly alter the rate of accumulation and growth. Market incentives, without right policies in place, lead the economy to specialize in the production of those traded goods in which it has a comparative advantage.

## 6. Policy Options

According to Mazzucato (2022) since 1940s Latin America's economies were dominated by "very strong monopolies" that made excessive profits. Instead, governments should develop "mission-oriented" strategies across industrial sectors and ministries. These could solve specific challenges, such as sustainable mobility or adding value in an environmentally friendly way to commodity exports, rather than supporting particular industries. The recommendation for Latin America y any LDC nation is not to turn away from manufacturing and abandon the path of economic development through industrialization, but to emulate the experience of rapid industrialization that occurred even in recent years.

In Mexico, the state intervention to promote specific sectors or industries is needed. Given deindustrialization mostly in basic industries cannot scheme industrial policy all together. For such industrial policy to be potentially effective, however, such policy must be associated by a host of other smart policies. Promoting exports that can enter global markets is the model that should be exerted, yet countries across the spectrum from Mexico to Brazil to compete they need to promote and protect. Tough promotion can take forms and can entail both good and bad policies is to have an effective industrial policy. Governments must lead the way building up the supporting infrastructure and induce a strong private sector with the ability to penetrate global markets and take advantage of the nearshoring.

Certainly, the future of manufacturing thus will be underpinned by two elements: digital technologies and collaboration but the industrial metaverse is the epitome of these elements and uses extended reality to blend the physical and digital worlds to transform our interactions with products. However, in LDCs like Mexico the priority of the new industrial policy to overcome endemic structural drawbacks now but looking into the future requires the following elements:

**A better industrial strategy.** Deliberately and explicitly, Mexican government must pursue levelling up economic regions, improving the support to the small and medium enterprises, strengthening skills and training (made up of universities, specialised training institutes to promote apprenticeship schemes, and so on) , managing the transnational corporations so to maximise the benefits from their presence, while minimizing their costs; among other institutional issues featuring in the iconoclastic views of thriving economies (LDCs and EMEs alike) thriving to catch up with the AEs.

**Productivity.** The governments industrial strategy must identify the foundations of productivity: innovation, people, infrastructure, and places o space and business environment. As part of its effort to drive higher output per hour by workers, the strategy sites a plan to raise total research and development investment to 2.4% of GDP.

The biggest criticism of the strategy is its failure to address the productivity of small and medium sized enterprises (SMEs) and in the supply chain. The government had not recognized "the scale of the challenge in terms of the competitiveness of the Mexican supply chain. On the other hand, most welcomed the creation of an industrial strategy council, which will have oversight of implementation of the proposals and be able to hold this and subsequent governments accountable for progress.

**Skills.** A persistent complaint from all sectors is a lack of relevant skills, particularly as an ageing population begin to retire in masse. Ministers acknowledge the need for an urgent focus on new types of skills but also on a new way of learning. Along with increased funding for the stem subjects –science, technology, engineering, and

mathematics-, the government will create a new regulator, the office for students, to address employer and student needs. It also wants to create a new national retraining scheme to support re-skilling within a new education policy.

**Digitalization and technology.** The industrial strategy identifies the growth of data and artificial intelligence as a big challenge for the economy, but plants to tackle it are limited to a collection of small investments.

## 7. Conclusions

The Mexican economy was diversifying throughout 1950s -1970s period but from the mid-1970s to mid-1980s got the Dutch disease syndrome and immerse itself in a specialisation process since late 1980s and early 1990s displayed a reversal of the diversification trend experiencing a, a re-specialisation of the economy back to 1970 and 1980s level. The reversal happened in 1989, when the per capita GDP was USD7,000 evaluated at PPP exchange rates in 2013. Interesting the bulk of this re-specialisation correspond to an increase in the average share of services at the expenses of manufactures. So, Mexico caught de-industrialisation but as before-mentioned, deindustrialization is a country-specific phenomenon. So, it has been differentiated by asymmetrical circumstances which distorted its industrial configuration.

Despite the offsetting influence of the manufacturing added value generated by the long established in-bond industry and the robustness of non-durable goods coming from the outgoing nearshoring process, Mexico really has been deindustrializing since the latest re-specialization staged in 1991 until 2023. The sudden reversal of the mild diversification experience which had gathered momentum with the so-called industrial re-conversion undergone in the 1980s fueled by rising hydrocarbon resources gave way to a re-specialization phase which hasn't made it go back to extractive activities like that prevailing in the 1970s and early 1980s, but increasingly moved it into a services sector -and especially of financial services- at expense of the manufacturing subsector.

Though the latter feature is now shared with other deindustrializing experiences in Latin America, the sui-generis structural change happened in Mexico at the early 1990s is different from them in terms that deindustrialization has been tarnished by the factors above mentioned. Mostly, due to the nearshoring effect which make appear the Mexican economy like a manufacturing powerhouse fundamentally root-seated upon national infrastructure. This makes difficult to estimate the true degree of deindustrialization embedded in the Mexican economy through standard econometric techniques and consequently to design the right policies to gradually reduce re-industrialization and in parallel to boost re-industrializing scheme, too. Except, obviously, if the proportional manufacturing added value due to the FDI flows is separate from that originated by firms producing non-durable good oriented fundamentally to the internal market, were available.

As the proximate industrialization stage reversal responded mainly to enablers such as the commercial and financial policies prematurely brought forward by rounds of structural reforms in the late 1980s and early 1990s and which were speedily assumed for Mexico through its adherence to the General Agreement on Tariffs and Trade (GAAT) and the World Trade Organization (WTO) and later to the NAFTA and the USMCA deals; the new industrial strategy must taking-off from stagnant industrial output in the traditional subsector industrial self-aware that the industrial revival of Mexico no only go past correcting short-term economic dips and attempting rather structural problems, but also modernizing industry while speeding up the transition to green energy.

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