Changes in the Brazilian Productive Structure and Economic Growth during the Great Recession

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Brazil achieved a period of relatively high economic growth from 2004 to 2008, after a long period of unstable and low economic activity. This short period of improved performance was achieved when the world scenario was favourable for the performance of the Brazilian trade balance due to rising commodity prices and growing external demand. In this setting, Brazilian exports increased considerably, followed by rises in domestic GDP, manufacturing GDP, consumption, gross fixed capital formation and imports.

The Great Recession that emerged after the financial crisis of August 2007 brought challenges to the Brazilian manufacturing industry, with consequences for the country's GDP growth. Brazil has an important and diversified industry, especially compared to other Latin American countries, and its performance has an important role to play on the Brazilian economic activity. The outcome after the Great Recession is lower manufacturing GDP and considerably higher imports.

A recent debate stresses the problem of currency appreciation and favourable prices for production and exports of commodity, together with the already existing Brazilian comparative advantage in these sectors, as the main reasons why Brazil is not able to sustain higher economic growth rates. Bresser-Pereira and Gala (2010) point out this problem and define it as a chronic currency over-appreciation that could start a process of 'regressive specialization'[1] in the production structure. The high competitiveness of these commodity sectors would generate excessive trade surpluses. Such surpluses, along with capital inflows, would then appreciate the national currency and increase the disadvantages of the manufacturing sector in the external competition.

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[1] The term 'regressive specialization' was suggested by Coutinho (1997). Regressive specialization is understood in the Brazilian economy as a decrease in the degree of diversification and integration of the productive system with loss of density in several production chains due to higher imports of components and capital goods.

The low dynamism of the manufacturing production would then explain the lower GDP growth rate. Accordingly, this currency appreciation would prevent Brazil to develop its manufacturing structure, thus blocking the technological development of tradable goods sectors. Additionally, IEDI (2012) points out that the increasing globalisation of the manufacturing production along with misalignments in the real exchange rate are likely to cause irreversible losses in the manufacturing structure of countries with an overvalued currency.

Sarti and Hiratuka (2010), on the other hand, argue that despite the long period of stagnation and the interruption of the industrialization process in the 1980s, and decreases in the density of some industrial chains during the 1990s, the Brazilian manufacturing still maintains a diversified structure. This structure is then able to generate dynamism for the economy as a whole. According to them, the available evidence is not compelling enough to allow one to characterize this process as one of definitive de-industrialization in Brazil and they refer to the recent process as 'interrupted industrialization'. The authors also argue that despite the long period of low economic growth, Brazil was able to keep a relatively complex industrial structure.

The aim of this paper is to investigate the changes occurred in the Brazilian productive structure in the period after the emergence of the Great Recession, when Brazil was not able to sustain its previous GDP growth rates, in relation to the period after 2003, when the country's economic performance improved. For this purpose, we use the input-output structural decomposition analysis (SDA) applied to the data provided by the Brazilian Institute for Geography and Statistics (IBGE). More specifically, the objective is to decompose the production variation and verify which component (intermediate consumption or final demand) caused the change in each economic sector's output over the period of investigation. This is the standard analysis of the SDA literature and we improve it further by including a disaggregated study of the causes of changes in imports in the relevant sectors.

This analysis is undertaken by sectors of activity, so we can have a better view of the sectors that have changed more substantially and the implications of that changes on economic growth. It is then possible to provide elements to understand the difficulties Brazil has faced to sustain its economic growth since the emergence of the Great Recession.

The global crisis that started in 2008 has brought further challenges to the Brazilian manufacturing industry. One important feature is that before the crisis, GDP and manufacturing GDP increased at the same path; however, after the crisis, manufacturing GDP falls below the growth rate of GDP (Baltar, Hiratuka and Lima, 2016). Moreover, imports have increased since 2006, actually increasing even further after the 2008 crisis, to surpass exports. Another important feature of the recent performance of the Brazilian economy is that gross fixed capital formation starts increasing after 2003 and especially after 2006, when the Brazilian economy was under a positive economic scenario. This increase was interrupted by the recent financial crisis, but recovered and kept on until 2011, when the signs of stagnation were shown.

To understand this performance, it is important to consider other elements apart from the exchange rate. Baltar, Hiratuka and Lima (2016) points out that the investment responsiveness to changes in the exchange rate takes place mainly through imports, especially due to the effect of currency appreciation on imports of final goods. In general, the higher competition with imported products has offset the positive effect caused by cheaper imported inputs or capital goods.

However, the authors find that the impact of changes in the exchange rate was not uniform across sectors of activity. When they splitted the sectors according to their mark-ups relatively to the average mark-up, they found that the influence is found in sectors with mark-ups below the mean. These sectors have, in general, experienced changes in import coefficients which are higher than their export coefficients, and reduced their share in total investment in the period under consideration. For the sectors with mark-ups above the mean, there was no evidence that changes in the exchange rate impacts investment decisions. These sectors are associated with the mining sector and natural resource-based industries, which have experienced high profitability regardless the level of exchange rate.

According to Baltar, Hiratuka and Lima (2016), "an important policy implication for the Brazilian experience is that exchange rate devaluations can have positive impacts on an important set of industries, by inducing investment and hence capacity expansion. It should be pointed out that, despite the increased competition for manufactured products with the emergence of strong Asian competitors in the global scenario, the synchronized global economic growth has mitigated the effects of this process in the Brazilian economy. However, the post-crisis scenario has been quite different, with a much more

fierce competition, which makes it necessary a favourable, competitive exchange rate to foster domestic production and encourage investment. Yet the presence of a set of sectors affected very little by the exchange rate also points out to the difficulty in creating a convergence of interest within the business sector about the necessity and effects of possible changes in exchange rate policy aimed to improve the incentives to industrial investment".

In this paper, a traditional SDA is performed to find the technology change and the final demand change. However, the final demand is further decomposed between its different sub-components (household consumption, government expenditure, gross fixed capital formation and exports). Then, each variation are used to find the corresponding import requirements and value added. Each component can be multiplied by the import and value added input coefficients to find the corresponding effect on imports and value added.

The results suggest that the performance of sectors are not uniform neither the impact of the crisis and the responses of each sector to a raised international competition. Therefore, the results indicate that broader conclusions that emphasize the importance of exchange rate as an important element for the difficulties faced by the Brazilian industry are not enough to understand the real problem. They should be complemented by sectoral information to better evaluate the impact of the crisis on the Brazilian productive structure.

The results, then, contribute to a better understanding of the changes in the relevant sectors' products, the impact of imports and their consequences for the country's GDP; thereby providing further evidence and explanation of the poor performance of the Brazilian manufacturing sector and GDP growth.

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