**ARE THE EXPORTS FROM ASIAN COUNTRIES DISPLACING BRAZILIAN EXPORTS? A STUDY OF TRADE CREATION AND TRADE DIVERSION**

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**Abstract: This article seeks to contribute in the analysis of the impacts the expansion of exports originated in Asia and China bring to the Brazilian exports to its main trade partners. The guiding question and main concern of the current research is to evaluate if the Asian exports have displaced Brazilian exports in third markets. The conducted methodology suggests that Brazilian exports are growing in the analysed markets, despite the strong competitive pressure brought by the Asian countries. However, such growth is smaller than that of the Asian competitors; thus, the Brazilian market expansion was less dynamic, constituting a relative market loss, which is more intense in the manufactured goods sector.**

**Key Words: Brazil; China; trade creation and trade diversion; development**

**JEL: F1; O5**

**Resumo: O presente artigo avalia os impactos das exportações originadas na China, em particular, e na Ásia em geral, sobre as exportações brasileiras direcionadas para terceiros mercados. Procura-se verificar se há, ou não, um efeito-deslocamento, onde o crescimento das exportações daquelas economias poderia estar contribuindo para um desempenho menos dinâmico das exportações brasileiras. Utilizando a metodologia de modelos gravitacionais, constatou-se que, de fato, o comportamento das exportações totais e de produtos manufaturados para uma amostra de 48 parceiros comerciais do Brasil, revelou-se menos dinâmica no período 1995-2010, possivelmente por interferência da capacidade das economias asiáticas em avançar no comércio internacional de forma mais intensa.**

**Palavras-chave: Brasil, China, criação e desvio de comércio; desenvolvimento**

**Are the exports from Asian countries displacing Brazilian exports? A study of trade creation and trade diversion**

1. **Introduction**

It has become common sense the argument that the global economy’s dynamism will be increasingly dependent on what happens in emerging and developing economies. The rise of periphery countries takes place in a scenario of reorganization of the international economic and political structure, whose great wheel of power gradually moves towards the East[[1]](#footnote-1) (Yang, 2006; Canuto and Giugale, 2010; Timmer *et al.,* 2011; Pettis, 2013). In this context, the mature economies loose relative dynamism while Asian countries, particularly China, re-emerge as protagonists in the geopolitical and economic *mise-en-scène* that is being established in the twenty-first century. Accordingly, the Asian countries are increasingly becoming fundamental economic and political partners for Brazil.

Trade and investment have risen exponentially while the growing demand for primary goods becomes a substantial source of economic dynamism for the country. In 2009, China became the main Brazilian trade partner, occupying a position that had been held by the United States for more than 80 years. Moreover, for the first time, Asia became the main destination for Brazilian exports, displacing a status traditionally held by the European Union. China and Brazil are respectively the largest developing economies of the East and the West, and the world’s second and sixth largest economies. Nevertheless, since the early 1980s both countries have experienced markedly different trajectories. While the Brazilian economy has stagnated, particularly in terms of capital accumulation, productivity gains and physical and social infrastructure, the Chinese economy has experienced one of the most remarkable structural transformations in the modern era (Palma, 2007 and 2012; Rodrik and McMillan, 2012).

To put in perspective, in 1980 Latin America accounted for 11% of the world’s GDP (measured in purchasing power parity), while Asia’s share (excluding Japan) was 9%.Three decades later, Latin America had 8.5% and Asia, 28%. During this period, Asian countries averaged a GDP growth of 7% per year, while Latin American countries experienced lower rates, between 2% to 3%. Considering the manufacturing sector value added, Asian countries’[[2]](#footnote-2) contribution to the world total increased from 4.4% to 27.6%, and Latin America’s[[3]](#footnote-3) share decreased from 6.7% to 5.5%. Advanced countries[[4]](#footnote-4) and the rest of the world also experienced a relative reduction in their shares, respectively, from 61.1% to 47% and from 27.8% to 20.8%. Similar figures can be found for merchandise trade[[5]](#footnote-5). Another interesting perspective is the evolution of the Brazilian manufacturing sector; in 1980, the country held the largest manufacturing sector among all developing countries, ranked in the eighth position worldwide, with a 2.6% participation in world production. In the same year, China ranked twelfth, with 1.7% participation, while South Korea ranked twentieth-eighth, with 0.6%. Thirty years later, Brazil ranked eleventh, behind China, South Korea, India and Mexico. Nevertheless, despite its relative decline, Brazil still holds a respectable 1.7% of the world manufacturing value added, which seems to be increasingly threatened by the competition of Asian countries.

This increasing exposure of Asia to international trade and its growing presence in the Latin American reality has intensified the debates within the academy about the heterogeneity of the impacts involved in the process. [[6]](#footnote-6) A more optimistic approach[[7]](#footnote-7) of the literature has emphasized the benefits of the increasing export revenues in Latin American countries abundant in natural resources, especially beneficiating the countries already characterized by a high degree of specialization in commodities production and exportation.[[8]](#footnote-8) Nevertheless, the impacts are not the same in all countries and sectors. A more pessimist approach[[9]](#footnote-9) usually admits the potential benefits stated above, however also emphasises potential negative impacts to the region. The emergence of an asymmetrical pattern of relationship, where Latin America would be trapped in a less dynamic status of producer and exporter of raw materials, has received particular attention (Bittencourt, 2012; Rosales and Kuwayama, 2012). Moreover, the region’s manufacturing sector contracts in the face of increased Chinese competition at home and abroad, intensified by the sluggish recovery in advanced economies, which amplifies Chinese pressures to access dynamic markets in emerging countries (Rodrik, 2011). Accordingly, China’s interaction with the region could reinforce long-term problems such as the “curse of natural resources” (Sachs and Warner, 1987; Sinnot, Nash and De La Torre, 2010), the “Dutch disease”, deindustrialization (Rowthorn and Wells, 1987; Palma, 2007) and the displacement of the region’s exports destined to its main trade partners. As a consequence the regions’ development perspectives could be undermined.

Within such scenario, Mexico, Central American and the Caribbean countries tend to feel the negative externalities of China’s rise with more intensity, since they both face the competition from Chinese manufactured goods in the American market and they are not major exporters to China. On the other hand, countries already characterized by a high degree of specialization in commodities production and exports, such as Argentina, Chile, Colombia, Venezuela, to name but a few, tend to have the positive impacts of the relation more intense, enjoying a virtuous cycle of growth with low external and fiscal vulnerabilities. However, Brazil can be treated as a mixed case, since it is both a large producer of natural resources and also a major manufacturing country, dealing with the positive and negative externalities. Therefore, there is no “one size fits all” pattern of relationship between China and Latin American countries.

Regarding exports displacement, previous studies showed evidence that China’s exports of manufactured goods have been displacing those of other countries and stimulating deindustrialization processes[[10]](#footnote-10). Thus, it becomes increasingly relevant to assess whether China and other Asian countries have been displacing Brazilian manufactured goods’ exports to its main trade partners. Recent research suggests that this might be the case (Bittencourt, 2012; Lélis, Cunha and Lima, 2012; Jenkins and Barbosa, 2012). According to this literature both Brazilian and Chinese exports of manufactured products to Latin America have boomed, particularly in the post-2003 period. The region’s economic recovery after 2002 has opened space for that expansion. Nevertheless, the Chinese manufactured products exports trend has been growing faster than the Brazilian manufactured products exports, because of their volume effect and diversification.[[11]](#footnote-11)

This article seeks to further contribute, in a potentially original way, to the analysis of the impacts the expansion of exports originated in Asia and China bring to the Brazilian exports to its main trade partners. The guiding question and main concern of the current research is to evaluate if the Asian exports have displaced Brazilian exports in third markets. The conducted methodology suggests that Brazilian exports are growing in the analysed markets, despite the strong competitive pressure brought by the Asian countries. However, such growth is smaller than that of the Asian competitors; thus, the Brazilian market expansion was less dynamic, constituting a relative market loss, which is more intense in the manufactured goods sector. On what concerns the methodological aspects, this article practices the empiric strategy of using modified gravitational models in order to capture trade creation and trade diversion effects as a by-product of the expansion of Asian exports.

It is important to mention that the Brazilian situation of decreasing exports dynamism and relative market loss, particularly with manufactured products[[12]](#footnote-12), is parallel to that observed in other countries around the world, whose capacity to keep and expand market position is increasingly jeopardized by the constant competitive pressure imposed by the Asian exporting economies. Therefore, while shedding light on the Brazilian situation, the current paper seeks to address a broader topic, which has been affecting most developed and developing countries, contributing to the literature using a potentially original methodology. [[13]](#footnote-13) Although the results achieved in the simulations of the research still constitute a partial and inconclusive representation of an extremely complex process, they are convergent with the international literature on the subject. Besides this introduction, the second part of the article will present a revision of the literature through a theoretical approach about trade creation and trade diversion effect and about the gravitational model and econometric strategy used. The subsequent sections comprise an assessment of the “China effect” and the “Asia effect” on the Brazilian exports, respectively. Finally, the main points will be recalled to draw the final considerations.

1. **Revision of the Literature: trade creation and trade diversion through the utilization of trade gravitational models**

In order to assess to what extent the exports originated in Asia, particularly in China, are affecting the Brazilian exports, the current article begins by reviewing the theoretical approach of trade creation and trade diversion, traditionally used to evaluate the effects of a customs union (Gandolfo, 1994; Eichengreen, Rhee and Tong, 2004; Greenaway, Mahbir and Milner, 2008). The label “China-effect” and “Asia-effect” is used to characterize the process of relative market loss of the Brazilian exports to its main trade partners due to the expansion of the Chinese and Asian exports[[14]](#footnote-14), respectively.

From an empirical point of view, the international trade gravitational model is used in order to evaluate: (i) the Brazilian exports to its main trade partners and (ii) how the Asian and Chinese exports to the same markets are affecting the dynamics of Brazilian exports. The strategy, therefore, consists in adding the Asian or Chinese exports to the main Brazilian trade partners as explanatory variables in the traditional gravitational equation.

The gravitational models are based on the idea that the trade volume between two countries is directly proportional to the product of their sizes and inversely proportional to the distance between them, hence creating its analogy with the gravitational attraction models between two masses. The use of such model was introduced by the seminal works of Tinbergen (1962), Poyhonen (1963) and Linnerman (1966), which delimitated the basic variables for the estimation of the model, using factors that indicate the potential supply and demand as a proxy of the size of the economy, or as elements that explain the attraction between countries, and using distance to explain the resistance to trade, or the proximity to transport costs.

Critics argue that the gravitational equation does not have clear theoretical fundamentals (Unctad, 2012). However, at least since Andersen (1979), the possibility of deriving gravitational equations from the fundamentals of different trade theories has been verified (Feenstra *et al*., 2001, Evenett and Keller, 2002, Feenstra, 2004). Likewise, Dearforff (1998) suggests that the variables and the signals of the gravitational equation can be deduced from the Hecksher-Ohlin (H-O) model without the product differentiation hypothesis. On the other hand, Eaton and Kortum (2002) develop an approach derived from the Ricardian model of commerce with homogeneous goods. Krugman (1980) derives the gravitational equation from a monopolistic competition model with economies of scale, product differentiation and transport costs. In this model, when two economies decide to trade their products, the increasing returns generate earnings with bilateral trade, even though both sides have the same demands, technologies or factor endowments.

One of the consequences of Krugman’s model (1980) is the so called “home market effect”, in which big countries tend to be exporters, as long as their domestic market attract the setting of new companies. According to this theoretical approach, what determines the export basket is the size of the internal market, in other words, countries do not export only goods they have comparative advantages, but also those which the internal market allows to produce in a higher quantity due to the increasing returns to scale in conditions of imperfect competition. This perspective stimulated the introduction of exporting countries’ GDP as an explanatory variable in the basic gravitational equation.

Despite the diversity of theories that may be used to interpret the gravitational equation, the results found by the empiric researches show a consensus in the existing of a positive correlation between the bilateral trade flow and the size of the partner economy and a negative correlation between flow and distance. A deeper revision of the theoretical approaches developed to the gravitational equation may be obtained in Harrigan (2002) and Unctad (2012).

Moreover, the use of the gravitational equation has been efficient to explain the trade creation and trade diversion effect, a concept traditionally derived from the customs union models, as showed by Rose (2002), Engelbrecht and Pearce (2004), Eichengreen, Rhee and Tong (2004), Greenaway, Mahbir and Milner (2008), and Unctad (2012).

This article applies the empiric strategy developed by these authors, especially influenced by Eichengreen, Rhee and Tong (2004) and Greenaway, Mahbir and Milner (2008), in order to evaluate the China-effect and the Asia-effect in Brazil. Other studies have used convergent models and empirical strategies to access similar issues, such as Giovannetti and Sanfilippo (2009), Giovannetti, Sanfilippo and Velucchi (2011), Dong and Whalley (2011), Di Giovanni, Levchenko and Zhang (2012) and Mikkelsen and Pérez Ruiz (2012).

The model to be estimated assumes the following functional formula:

ln ExpBrit = β0 + β1 ln ExpChit + β2 Xit + Єit (1)

Where: ln ExpBrit represents Brazilian exports to country *i* in time *t*; ln ExpChit represents Chinese exports to country *i* in time *t;* Xit is the vector of explanatory variables typical of gravitational models; Єit is the errorcomponent.

In other words, the China-effect will be explained by the influence that Chinese exports have over Brazilian exports to third countries. A similar procedure will be adopted in the subsequent section, which will assess the Asia-effect in a similar exercise which will consider the aggregate level exports of the Asian economies.

The variables used in the gravitational model and represented in the Xit vector are:

* GDPpari : GDP of trade partner *i*;
* GDPpcpari : *per capita* GDP of trade partner *i*;
* GDPbr: Brazilian GDP;
* GDPpcbri : Brazilian *per capita* GDP;
* distbri: distance between trade partner *i* and Brazil;
* borderi: dichotomic variable which represents if partner *i* is a neighboring country with Brazil;
* languagei: dichotomic variable which represents a common language with Brazil;
* ILtradei: free trade index from Heritage Foundation.

As in Greenway, Mahbir and Milner (2008), Rose (2002) and Engelbrecht and Pearce (2004), the total trade volume is used as an explanatory variable in constant price levels. According to these authors, such variable produces statistically more consistent results. They also argue that, in order to differentiate the characteristics of the importing and exporting countries, it is necessary to include their GDP as an explanatory variable. Additionally, the freedom of trade index from Heritage Foundation (2012) is also included to symbolize the tariff barriers and the non-tariff barriers to trade. This index is calculated from a weighted average of the tariff and non-tariff barriers to trade. The bilateral trade data is from IMF (2012) and is represented in constant terms for the 1995-2010 timeframe. The total GDP and the *per capita* GDP are also represented in real terms in constant dollars of 2000 and were obtained in the WDI (World Bank, 2012). The distance, border and language variables correspond to the attempt of approximating the transport costs between the trade partners and were obtained in the database of the Centre D'Etudes Prospectives et D'Informations Internationale (CEPII, 2012).

The resulting panel is formed by the 48 selected countries (see Annex I), the main trade partners for Brazil, in addition of China, accounting for more than 90% of the Brazilian exports between 1995 and 2010.[[15]](#footnote-15)

In total, twelve models were estimated, considering the following situations: (i) a sample of the 48 main trade partners for Brazil; (ii) a sample of Latin American trade partners; (iii) the total period (1995-2010); and (iv) two sub periods: 1995-2001 and 2002-2010. Such division in two sub periods seeks to assess the situation following to China’s entrance in the World Trade Organization (WTO), which took place in 2001, followed by its fast rise to the condition of world’s largest exporter and second largest importer. A similar procedure is applied in section four, to evaluate the Asia-effect. More specifically, the following exercises are simulated in next section: (i) the China-effect in the Brazilian total exports and industrial exports to its 48 main trade partners, divided in two different periods; (ii) the China-effect in the total exports and industrial exports to its 12 main trade partners in Latin America (see Annex I), divided in two different periods.

Additionally, the trade creation and trade diversion analysis allows assessing the effect on trade caused by the entrance of a country to an integrated economic union. Theoretically, when a group of countries decides to constitute a customs union, two different effects are generated on international trade. The trade creation effect is related to the new volume of trade that is created due to the elimination of trade barriers among the newly integrated countries; and the trade diversion effect, which is the volume of trade displaced from the rest of the world and now fulfilled among the integrated members, due to the competitive advantages provided by the trade barriers. China’s entrance to the WTO may be interpreted through this methodology, as observed, for instance, by Eichengreen, Rhee and Tong (2004), Abraham and Van Hove (2005), Greenaway, Mahabir and Milner (2008).

1. **Assessment of the China-effect**

In order to evaluate the trade creation and trade diversion effects, an econometric methodology of panel data will be used, which allows to capture, simultaneously, the temporal and countries relation. At first, in the estimation of equation 1, it is possible to observe that the variable “Chinese exports” is endogenous, given that the Chinese and the Brazilian exports may have been influenced by a third factor which may not be under consideration inside the model, implying that the error would be correlated with such variables and turning the estimation not to be consistent. In order to eschew this problem, it is necessary to estimate a model with instrumental variables. The most adequate instruments, according to Eichengreen, Rhee and Tong (2004), Abraham and Van Hove (2005), Greenaway, Mahabir and Milner (2008), among others, are the following: (i) distance between China and its trade partners; and (ii) China’s GDP. In this article, due to the utilization of a dynamic model, the chosen instrument is GDP. The distance is constant, thus not the best instrument for the study.

The probable heteroscedasticity is corrected through the GMM estimator, which is more efficient in this case. Moreover, the Hansen test shows (see table 1) that the instruments are efficient and valid for all the situations estimated in this article. [[16]](#footnote-16)

Table 1 presents the results of the estimations. Considering, firstly, the Brazilian exports to the 48 selected countries (models 1 to 3), the main results indicate that the variable *lnexpch*, which accounts for the volume of Chinese exports to the same destination countries as Brazil’s, is significant in models 1, 3 and 3.1, with values between 0.23 and 0.39. This means that a growth of 1% of Chinese exports to country *i* is related with a variation between 0.23 and 0.39 percentage points of the Brazilian exports’ growth. It is noteworthy that the estimations suggest Chinese exports’ growth does not hamper Brazilian exports to expand its exports in the selected destination countries. The exports of both countries grow in the analyzed period, however Brazilian exports growth is smaller than the Chinese in the same destination markets.

The variables related to language and border are statistically not significant in the majority of the situations and do not cause major disturbances in the estimations. Likewise, model 2, in the 1995-2011 timeframe, was little consistent and had most of its variables not significant, as a reflection of the short span of time and its intense macroeconomic volatility.

When the analysis is divided in sub periods, previous and after the entrance of China to the WTO, the results have a significant relation only in the 2002-2010 period (models 3 and 3.1). In this case, it is possible to observe a strong correlation between the GDP and *per capita* GDP variables in Brazil, with effect over the estimated coefficients, as a reflection of the multicolinearity between them during the period. Moreover, border and language are not statistically significant, given that these variables are constant with time, revealing that they are not good dynamic indicators of the trade cost in the Brazilian case. Therefore, such variables were excluded in the model 3.1. The same problem happens in model 6, with the industrial sector.

**Table 1. China-effect on Brazilian Total Exports**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Models | 1  1995-2010 | 2  1995-2001 | 3  2002-2010 | 3.1.  2002-2010 | 4  Industry  1995-2010 | 5  Industry  1995-2001 | 6  Industry  2002-2010 | 6.1.  Industry  2002-2010 |
| LnExpCH | 0.23\*\*\* (0.02) | -0.02  (0.11) | 0.49\*\*\*  (0.25) | 0.39\*\*\*  (0.01) | 0.21\*\*\*  (0.03) | 0.14  (0.14) | 0.85\*\*\*  (0.03) | 0.45\*\*\*  (0.01) |
| LnGDPPar | 0.0.78\*\* (0.07) | 1.12  (0.79) | 0.09  (0.10) | 1.09\*\*\*  (0.31) | 1.24\*\*\*  (0.09) | -0.15  (0.90) | 0.12  (0.10) | 1.30\*\*\*  (0.10) |
| LnGDPpcPar | -0.27\*\*\*  (0.04) | -0.39\*  (0.22) | 0.21\*\*\*  (0.08) | -0.59\*\*\*  (0.06) | -0.55\*\*\*  (0.60) | -0.02  (0.39) | -0.02  (0.08) | -0.71\*\*\*  (0.08) |
| LnGDPpcBR | 4.05\*\*\*  (0.20) | 7.82\*\*\*  (1.55) | 0.99\*\*\*  (0.27) |  | 3.84\*\*\*  (0.34) | 12.42\*\*\*  (2.08) | -5.19\*\*\*  (0.38) |  |
| LnGDPBR | -1.11\*\*\*  (0.60) | -2.59\*\*\*  (0.64) | 0.04  (0.09) |  | -1.12\*\*\*  (0.15) | -4.23\*\*\*  (0.81) | 2.21\*\*\*  (0.12) |  |
| Border | 0.31  (0.23) | 1.74  (2.90) | 1.06\*\*\*  (0.15) |  | 0.53  (0.37) | 10.14\*\*  (4.17) | 0.35  (0.25) | 0.57\*\*  (0.31) |
| Language | -0.11  (0.492) | -1.19  (1.16) | 0.72  (0.83) |  | -0.66  (1.34) | 20.27  (29.49) | 11.05\*\*  (5.35) | 2.29  (3.55) |
| LnDistbr | -1.26\*\*  (0.11) | -0.79  (1.39) | -0.76\*\*\*  (0.15) | -1.77\*\*\*  (0.05) | -2.07\*\*\*  (0.18) | 2.68  (1.97) | -2.09\*\*\*  (0.13) | -2.32\*\*\*  (0.21) |
| ILTrade | -0.01\*\*\*  (0.00) | -0.01\*\*\*  (0.00) | 0.01\*\*\*  (0.00) | -0.01\*\*\*  (0.00) | -0.01\*\*\*  (0.00) | 0.02\*\*\*  (0.01) | -0.02\*\*\*  (0.00) | -0.01\*\*\*  (0.00) |
| Hansen test (p-value) | 42.29  (1.00) | 15.63  (0.74) | 12.41  (0.573) | 46.76  (1.00) | 41.33  (1.00) | 13.26  (0.87) | 45.23  (1.00) | 45.35  (1.00) |
| N | 747 | 322 | 425 | 425 | 747 | 322 | 425 | 425 |

Obs.: Standard deviation inside parenthesis; \*\*\* 1% of significance, \*\* 5% of significance e \* 10% of significance.

The estimations made to evaluate the effects of Chinese exports over Brazilian exports of manufactured goods (models 4 to 6) show, at first, similar results to those observed for the total trade of goods. Chinese exports for the same markets as Brazilian exports have a positive relation and are statistically significant for the whole period and for the 2002-2010 timeframe. However, when compared, there is a larger effect in the model for the manufactured goods exports than for the total exports of goods (comparison in models 1 and 4). This means that, in the case of the manufactured goods exports, when compared to the total exports, the Chinese expansion is more intense than the Brazilian expansion in the same destination markets.

Therefore, according to the applied methodology, it is possible to observe that there is trade diversion – which in this case is conceived by an inferior market expansion of Brazilian exports while compared to Chinese exports in the same selected destination markets, which account for more than 90% of the total Brazilian exports. This dynamic is more intense in the exports of manufactured goods.

Models 7 to 12 reproduce the previous empiric strategy, but now emphasizing the main Brazilian trade partners in Latin America. The effect of Chinese exports over Brazilian exports is estimated considering the full export basket and only the manufactured goods exports. According to table 2, it is possible to deduce that the estimated coefficients suggest that Brazilian exports to Latin America have a positive relation with Chinese exports to the same region, being statistically significant in models 7 to 10, which analyze the total exports and those of manufactured goods for the whole studied period. The estimations divided in sub periods are not statistically significant in this case.

**Table 2. China-effect on Brazilian exports to Latin America**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Model 7 | Model 8  1995-2001 | Model 9  2002-2010 | Model 10  Industry | Model 11  Industry 1995-2001 | Model 12  Industry 2002-2010 |
| LnExpCH | 0.331\*\*\*  (0.127) | 0.031  (0.039) | 0.240\*  (0.125) | 0.217\*\*\*  (0.106) | 0.031  (0.033) | 0.158  (0.104) |
| LnGDPPar | 0.576  (1.03) | 0.577\*\*\*  (0.144) | -0.199  (1.324) | 0.618  (1.199) | 0.543\*\*\*  (0.143) | 0.814  (1.261) |
| LnGDPpcBR | 5.269\*\*\*  (1.32) | 12.958\*\*\*  (1.788) | 4.855\*\*  (2.041) | 4.705\*\*  (1.84) | 12.354\*\*\*  (1.419) | 4.396\*\*  (2.175) |
| LnGDPBR | -6.750\*\*\*  (2.30) | -3.866\*\*\*  (0.718) | -3.863\*\*\*  (2.504) | -3.627\*\*  (1.811) | -3.745\*\*\*  (0.483) | -2.839  (2.239) |
| LnDistbr | 7.235\*\*  (2.801) | -0.379\*\*\*  (0.110) | 4.175\*  (2.343) | 3.333\*  (1.659) | -0.274\*\*  (0.136) | 2.026  (1.73) |
| ILTrade | -2.276\*\*  (1.059) | 0.945  (1.171) | -0.222  (0.382) | -2.734\*\*  (1.180) | 1.050  (0.772) | -1.849\*  (1.031) |
| Hansen test (p-value) | 4.20  (1.00) | 5.01  (1.00) | 7.41  (1.00) | 5.25  (1.00) | 6.57  (1.00) | 7.26  (1.00) |
| N | 192 | 84 | 108 | 192 | 84 | 108 |

Obs.: Standard deviation inside parenthesis; \*\*\* 1% of significance, \*\* 5% of significance e \* 10% of significance.

While comparing this partial results with the results for the full sampling (table 1), it is possible to observe that Brazilian exports have a larger competitive capacity in Latin America, especially in the case of the full export basket. In the case of the manufactured goods exports, the market gains – relatively smaller than the Chinese gains – are equivalent to those observed for the rest of the world. In other words, for the analysed period, Brazilian total exports are more resistant to Chinese competition in the Latin American market.

Using the estimated parameters reported in Tables 1 and 2, the strategy now is to simulate the trade creation and trade diversion effects. The simulation is divided in two steps: (i) the trade diversion is calculated through the value of Brazilian exports that was lost due to the China-effect and (ii) the trade creation is calculated through the trade value that is created due to the growth of Brazilian exports to China. The final result is the total effect. These calculations are presented in Table 3.

The first step calculates the effect a 1% growth of Chinese exports to the selected destination markets has over Brazilian exports. The result of this simulation is the trade diversion effect, which is represented in column 4 of Table 3. The second step calculates the effect of a trade expansion caused by growth of the Chinese market for Brazilian exports, which is the trade creation or compensation effect, represented in column 8. This result is derived from the estimated coefficient of a 1% growth of China’s GDP over the imports incoming from Brazil. Therefore, it was considered that Chinese exports account for 28% of their GDP, which is the average from 2002 to 2010. In order to find the effect of a 1% growth of China’s GDP over Brazilian exports to China it is necessary to multiply the coefficient represented in column 5 by 0.28, which is reported in column 6.

The final results suggest that Brazilian exports keep growing, however in a slower pace than Chinese exports. In this case, trade diversion was not identified, yet a decrease in the market share of Brazilian exports. This relative market loss is more intense in the manufactured goods market, both for the whole sampling and for Latin America, where Brazil loses market in a faster pace.

**Table 3 Simulation of the trade creation and trade diversion effects (China-effect)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Markets** |  | **Estimated Coefficient (%)** | **Average ExpCh to the considered markets (US$ million)** | **1% ExpCh (US$ million)** | **Effect on ExpBr (US$ million)** | **Coeficient Estimated Model ExpBr to China(%)** | **Effect of a 0.28% GDPCh growth on ExpBr to China (%)** | **ExpBr yearly average to China (US$ million)** | **ExpBr growth to China (US$ million)** | **TOTAL EFFECT (US$ million)** |
|  |  | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** | **(9)** |
| **Total** | 1995-2010 | 0.23 | 384,636.08 | 3,846.36 | 884.66 | 1.50 | 0,42 | 4,992.60 | 20.97 | 905.63 |
|  | 1995-2001 | - 0.02 | 143,150.56 | 1,431.51 | - 28.63 | 0.51 | 0,14 | 1,057.81 | 1.51 | - 27,12 |
|  | 2002-2010 | 0.39 | 572,458.14 | 5,724,58 | 2,232.59 | 3.61 | 1,01 | 8,052.99 | 81.40 | 2.313,99 |
| **Total Manufacturing** | 1995-2010 | 0.21 | 351,435.99 | 3,514.36 | 738.02 | 1.34 | 0,38 | 4,636.96 | 17.4 | 55,41 |
|  | 1995-2001 | 0.14 | 123,455.79 | 1,234.56 | 172.84 | 0.50 | 0,14 | 949,49 | 1.33 | 174,17 |
|  | 2002-2010 | 0.45 | 528,753.93 | 5,287.54 | 2,379.39 | 4.71 | 1,32 | 7,505.00 | 98.98 | 2.478,37 |
| **Latin America** | 1995-2010 | 0.33 | 14,291.57 | 142.92 | 47.31 | 1.50 | 0,42 | 4,992.60 | 20.97 | 68,27 |
|  | 1995-2001 | 0.03 | 3,675.24 | 36.75 | 1.14 | 0.51 | 0,14 | 1,057.81 | 1.51 | 2,65 |
|  | 2002-2010 | 0.24 | 22,548.72 | 225.49 | 54.12 | 3.61 | 1,01 | 8,052.99 | 81.40 | 135,52 |
| **Latin America - manufacturing** | 1995-2010 | 0.22 | 13,413.34 | 134.13 | 29.11 | 1.34 | 0,38 | 4,636.96 | 17.40 | 46,50 |
|  | 1995-2001 | 0.03 | 3,501.49 | 35.01 | 1.05 | 0.50 | 0,14 | 949.49 | 1.33 | 2,38 |
|  | 2002-2010 | 0.16 | 21,122.56 | 211.23 | 33.80 | 4.71 | 1,32 | 7,505.00 | 98.98 | 132,77 |

Source: Authors’ calculations according to the estimations reported in Tables 1 and 2.

It is important to qualify the term “relative market loss”, as it may also be rightfully inferred to as “less dynamic relative gain”. Therefore, there is not a market loss in the strict sense, yet the absence of more substantial market expansions when compared to the competing economy, in this case, China (or Asia, which will be analyzed in section 4). Thus, during the analyzed period, Brazilian exports recovered market-share in the analyzed markets. However, Chinese exports and Asian exports had an even larger market-share expansion.

Additionally, the China-effect on the market-share of Brazilian exports is also simulated, considering the estimated coefficients in the gravitational model. For this calculation, it is considered that Chinese exports will keep the same average growth as in the 2002-2010 period (i.e. 20% per year). Furthermore, in order to facilitate the exercise, it is considered that there are only two exporting countries in the world – Brazil and China. Graphic 1 presents the results of this simulation, which was performed for a future five-year timeframe.

**Graphic 1. Simulation: China-effect on selected markets (5 years)**



Source: own elaboration using to Table 3.

Calculations suggest that, on average, the relative market loss (or less dynamic market gain) of Brazilian exports to China is: (i) 3.38% per year for the 48 countries sampling; (ii) 3.52% per year for the manufactured goods exports to the same sample; (iii) 2.95% per year for the Latin American countries sample; and (iv) 3.49% per year for the manufactured goods exports to Latin America.

Therefore, Brazil has a relative market loss, which is more intense in the manufactured goods exports than in the other sectors. It is important to once again emphasize that such relative market loss is referred to the fact that there is an absolute growth of total exports and manufactured goods exports; however this growth is smaller than the growth of Chinese exports to the selected destination markets.

Moreover, such simulations depend on the parameters calculated and on the aforementioned hypothesis. Therefore, the model does not consider eventual changes in the commercial strategies of both countries and or development policies implemented in a broader sense. This includes economic policies, which may have macroeconomic nature or the promotion of productive activities or international trade.[[17]](#footnote-17)

1. **Asia-effect: econometric strategy and results**

This section seeks to broaden the analysis to a wider group of countries, reproducing the same empiric strategy previously used, but including the following countries to the estimations: China, India, Malaysia, Thailand, Indonesia, Singapore, Philippines, and South Korea. Table 4 reports the results of the estimations. Differently from the models used for the Chinese case, the correlation between GDP and *per capita* GDP, both for Brazil and for the trade partners, caused disturbances in the estimations, which may affect their quality, as observed in Table 4 (model 13). Moreover, since *per capita* GDP was not statistically significant, it was chosen to exclude this variable from the model. The same problem was detected with the border and language variables, which were also excluded from the model. Therefore, the final estimated coefficients are represented in models 13.1 to 18, for the sample of selected countries, now of 40 countries; and in models 19 to 22, in the estimations for the Latin American case.

As in the case of the specific model for China, the exports of Asian countries are also endogenous, bringing the necessity of the utilization of a model with instrumental variables. The GDP of the selected countries was the most consistent statistical instrument found. The probable heteroscedasticity is corrected through the GMM estimator, which is enough for the case. The Hansen test suggests that the instruments are efficient and valid for all the estimations (Table 4).[[18]](#footnote-18)

In the case of the sample of Asian countries, the result is very similar to the results found in the Chinese case, given that the country accounts for more than half of the exports of the considered Asian countries and, still more relevant, denotes its tendency. All the estimated coefficients for the simulation of the effects of Asian exports on Brazilian exports (model related to the total exports) are statistically significant, with values that vary from 0.32, for the full period, to 0.42 for the post-2002 period. Once again, the Brazilian relative market loss (or less dynamic gain) is noteworthy.

In the case of Brazilian exports of manufactured goods, the results indicate a more intense effect, with market losses (or fewer gains) increasingly intense along time. The estimated coefficients are 0.21 for the full sample and 0.20 for Latin America, equivalent to the results found in the estimations for the China-effect.

In the case of the exports to Latin America, the negative effect is similar to the effect of the model to the sample of countries, in other words, Brazilian exports have a market-share loss in Latin America, due to the competition of exports originated in Asia, which happens with the same intensity than in the 40 countries sample. Moreover, the estimated coefficients are very similar to the ones found in the China-effect estimation. Such results may be considered coherent given their diversification, which is almost symmetric[[19]](#footnote-19), of Brazilian exports among the world’s regions.

**Table 4. Model Asia-effect on Brazilian exports to Latin America**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Model 13**  **1995-2010** | **Model 13.1** | **Model 14**  **1995-2001** | **Model 15**  **2002-2010** | **Model 16**  **Industry**  **1995-2010** | **Model 17**  **Industry 1995-2001** | **Model 18**  **Industry 2002-2010** | **Model 19**  **L.A.**  **1995-2010** | **Model 20**  **L.A.**  **1995-2001** | **Model 21**  **L.A.**  **2002-2010** | **Model 21**  **L.A.**  **2002-2010** |
| LnExpCH | 0.37\*\*\*  (0.04) | 0.32\*\*\*  (0.01) | 0.32\*\*\*  (0.04) | 0.42\*\*\*  (0.01) | 0.21\*\*\*  (0.04) | 0.21\*\*\*  (0.03) | 0.09\*\*\*  (0.05) | 0.30\*\*  (0.14) | -0.05  (0.13) | 0.22\*  (0.12) | 0.22  (0.24) |
| LnGDPPar | -0.19  (0.19) | 0.07\*\*  (0.04) | 0.16\*\*\*  (0.06) | 0.08\*\*  (0.04) | 0.08  (0.16) | 0.11  (0.07) | 0.34\*\*\*  (0.09) | -0.47  (0.88) | 0.20  (0.29) | 1.93  (1.64) | 0.09  (0.17) |
| LnGDPBR | -0.04  (0.23) | 0.27\*\*\*  (0.03) | 0.32\*\*\*  (0.05) | 0.31\*\*\*  (0.03) | 0.24  (0.16) | 0.24\*\*\*  (0.08) | 0.18\*\*\*  (0.05) | 0.49  (0.88) | -0.01  (0.11) | -1.56  (1.41) | 0.25  (0.17) |
| LnGDPpcPar | 0.30\*  (0.18) |  |  |  |  |  |  |  |  |  |  |
| LnGDPpcBR | 0.87\*\*  (0.36) |  |  |  |  |  |  |  |  |  |  |
| Border | 0.92  (0.97) |  |  |  |  |  |  |  |  |  |  |
| Language | 3.59  (2.91) |  |  |  |  |  |  |  |  |  |  |
| LnDistbr | -0.15  (0.61) | -0.80\*\*\*  (0.08) | -1.09\*\*\*  (0.19) | -0.87\*\*\*  (0.05) | -0.74\*\*\*  (0.09) | 0.80\*\*\*  (0.09) | -0.89\*\*\*  (0.23) |  |  |  | -0.72\*\*  (0.19) |
| ILTrade | -0.01\*\*\*  (0.00) | -0.01\*\*\*  (0.00) | -0.02\*\*\*  (0.01) | -0.02\*\*\*  (0.00) | -0.01\*\*\*  (0.00) | -0.01\*\*\*  (0.00) | -0.01\*\*\*  (0.00) | -0.02\*  (0.01) | -0.01  (0.01) | -0.02\*  (0.01) | -0.01\*\*\*  (0.00) |
| Hansen test (p-value) | 35.65  (1.00) | 40.29  (1.00) | 21.74  (0.42) | 39.22  (1.00) | 39.52  (1.00) | 38.97  (1.00) | 25.61  (0.22) | 8.28  (1.00) | 10.70  (0.98) | 8.57  (1.0) | 9.52  (1.00) |
| N | 601 | 601 | 237 | 364 | 601 | 364 | 237 | 180 | 72 | 108 | 180 |

Obs.: Standard deviation inside parenthesis; \*\*\* 1% of significance, \*\* 5% of significance e \* 10% of significance.

As done in the case of the China-effect, the Asia-effect is simulated for the market-share of Brazilian exports considering the estimated coefficients in the gravitational model. For this calculation, it is considered that Asian exports will keep the same average growth as in the 2002-2010 period (i.e. 14% per year). Furthermore, in order to facilitate the exercise, it is considered that there are only two exporting countries in the world – Brazil and China. Table 5 and Graphic 2 present the results of this simulation, which was performed for a future five-year timeframe.

**Graphic 2. Simulation: Asia-effect in selected markets (5 years)**



Source: own elaboration according to Tables 4 and 6.

Calculations indicate that, on average, the relative market loss (or less dynamic gain) of Brazilian exports due to the expansion of export from Asia is: (i) 1.71% per year considering the sample of 40 selected countries; (ii) 2.23% per year considering the exports of manufactured goods to the same sample; (iii) 1.80% per year considering the exports to Latin America; and (iv) 2.20% per year considering the manufactured goods exports to Latin America.

In a comparative perspective, it becomes necessary to use the same pattern of future evolution of the exportations. Therefore, a 10% yearly growth is considered, on average, for the Chinese and Asian exports to the selected markets. As indicated in Table 6, the total market loss effect is more intense in the Chinese case. However, in the case of Brazilian exports of manufactured goods, the effect is equivalent.

**Table 5. Average yearly effect and in 5 years of a 10% growth of the exports originated in Asia and China in the market quotas of the Brazilian exports (%)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **China-effect (1 year)** | **Asia-effect**  **(1 year)** | **China-effect**  **(5 years)** | **Asia-effect (5 years)** |
| Selected Markets (full sample) | 1.21 | 0.82 | 6.02 | 4.10 |
| Selected Markets (full sample) – manufacturing sector | 1.35 | 1.34 | 6.73 | 6.66 |
| Latin America | 0.78 | 0.91 | 3.89 | 4.55 |
| Latin America – manufacturing sector | 1.32 | 1.31 | 6.57 | 6.49 |

Source: own elaboration according to the estimations reported in Tables 4 and 6.

In short, the Brazilian manufacturing sector has absolute market gains, yet it has relative market losses, both to China and to the sample of selected Asian rising economies.

**Table 6 – Simulation of the trade creation and trade diversion effects (Asia-effect)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Markets** |  | **Estimated coefficient (%)** | **ExpAsia average to the selected markets (US$ million)** | **1% ExpAsia (US$ million)** | **Effect on ExpBr (US$ million)** | **Estimated coefficient Model ExpBr to Asia(%)** | **Effect of a 0,35% growth of GDPAsia on ExpBr to Asia (%)** | **Yearly average of ExpBr to Asia (US$ million)** | **ExpBr growth to Asia (US$ million)** | **TOTAL EFFECT (US$ million)** |
| **Total** | 1995-2010 | 0.32 | 687,156.42 | 6,871.56 | 2,212.64 | 1.09 | 0.38 | 10,148.60 | 38.72 | 2,251.36 |
|  | 1995-2001 | 0.32 | 397,378.98 | 3,973.79 | 1,271.61 | 0.21 | 0.07 | 3,110.86 | 2.29 | 1,273.90 |
|  | 2002-2010 | 0.42 | 912,538.88 | 9,125.39 | 3,787.04 | 1.15 | 0.40 | 15,622.40 | 62.88 | 3,849.92 |
| **Total Manuf.** | 1995-2010 | 0.21 | 588,404.81 | 5,884.05 | 1,253.30 | 0.88 | 0.31 | 2,394.63 | 7.38 | 1,260.68 |
|  | 1995-2001 | 0.21 | 338,536.56 | 3,385.37 | 694.00 | 0.39 | 0.14 | 1,193.28 | 1.63 | 695.63 |
|  | 2002-2010 | 0.09 | 782,746.78 | 7,827.47 | 688.82 | 0.63 | 0.22 | 3,329.02 | 7.34 | 696.16 |
| **LA** | 1995-2010 | 0.30 | 30,080.56 | 300.81 | 91.14 | 1.09 | 0.38 | 10,148.60 | 38.72 | 129.86 |
|  | 1995-2001 | - 0.05 | 13,560.75 | 135.61 | - 6.51 | 0.21 | 0.07 | 3,110.86 | 2.29 | - 4.22 |
|  | 2002-2010 | 0.22 | 42,929.29 | 429.29 | 93.59 | 1.15 | 0.40 | 15,622.40 | 62.88 | 156.47 |
| **LA Manuf.** | 1995-2010 | 0.23 | 26,523.24 | 265.23 | 61.00 | 1.09 | 0.38 | 10,148.60 | 38.72 | 68.38 |

Source: own elaboration according to the estimations reported in Table 4.

1. **Final Remarks**

This article has tried to contribute in the analysis of the impacts the expansion of exports originated in Asia and China bring to the Brazilian exports to its main trade partners. Our main concern was to evaluate if the Asian exports have displaced the Brazilian exports in third markets. Therefore, it belongs to a prolific literature that analyse the rise of periphery countries, particularly China, and its impacts on the international economic and political structure. Considering trade issues and using different models and empirical strategies previous efforts found evidence that the competitive pressures originated in China and other Asian countries have affected, sometimes in an adverse way, both developed and developing countries, such as in the works of Eichengreen, Rhee and Tong (2004), Abraham and Van Hove (2005), Greenaway, Mahabir and Milner (2008), Cepal (2011), Dadush and Shimelse (2012), Giovannetti and Sanfilippo (2009), Giovannetti, Sanfilippo and Velucchi (2011), Dong and Whalley (2011), Di Giovanni, Levchenko and Zhang (2012), Mikkelsen and Pérez Ruiz (2012), to name but a few.

In this context, we have assessed the relative impact of the expansion of exports originated in China and Asia over the Brazilian exports to its main trade partners from 1995 to 2010, dividing the exercise in total exports and manufactured goods exports. Modified gravitational models were used in order to capture the trade creation and trade diversion effects. The main results may be summarized as below:

1. Brazilian exports – total exports and manufactured goods exports – had an expansion in the analyzed markets, despite the strong competition pressure imposed by exports originated in Asia, especially in China;
2. However, the growth of Brazilian exports was inferior to the growth of exports from Asia and China, thus Brazilian market gains were less dynamic;
3. The performance of Brazilian exports to the Latin American market, especially concerning the manufactured goods exports, is comparatively better than the exports to the full sample of countries. In other words, the Brazilian exports, especially of the manufacturing sector, in the total analyzed period (1995-2010) and in both the sub periods (1995-2001 and 2002-2010) has a higher capacity to keep its market position in Latin America than in the other selected destination countries.

It is noteworthy that the Brazilian situation is similar to that observed in other developed and developing economies, whose capacity to keep and expand market positions in the international trade scenario is increasingly under constant competitive pressure imposed by the Asian exporting economies. Similarly, our own results and simulations are contingent to the proposed methodology and hypothesis, constituting a partial and inconclusive representation of a broader and extremely complex process. Yet, the simulations lead to results that are convergent with the international literature on the topic and allow better understanding the very reality of the Brazilian situation.

Finally, the results achieved by this article reaffirm the importance to the Brazilian economy of strengthening policies oriented to improve development prospects, which may have the nature of macroeconomic policies, infrastructure, human capital, institutional, and increasing the competitiveness of domestic companies. Brazil, as many other emerging countries, particularly in Latin America, has improved its economic and social performance. However, despite recent progress, the country has not yet recovered from a quarter of a century of semi-stagnation.

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**Annex I – Countries used in the exercise**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Europe** | **Africa + Middle East** | **Latin America** | **Asia** | **Others** |
| Germany | South Africa | Argentina | China | USA |
| Belgium | Saudi Arabia | Bolivia | Singapore | Canada |
| Spain | Argelia | Brazil | South Korea | Australia |
| Finalnd | Egypt | Chile | Philippines |  |
| France | United Arab Emirates | Colombia | India |  |
| Italy | Iran | Costa Rica | Indonesia |  |
| Norway | Kuwait | Ecuador | Japan |  |
| Netherlands | Moroco | Mexico | Malaysia |  |
| Poland | Nigeria | Panama | Thailand |  |
| Portugal | Turkey | Paraguai |  |  |
| United Kingdon |  | Peru |  |  |
| Russia |  | Uruguai |  |  |
| Sweeden |  | Venezuela |  |  |
| Switzerland |  |  |  |  |
| Ukraine |  |  |  |  |

**Annex II – Brazilian and Chinese exports to the 48 selected countries (US$ of 2000)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Brazil** |  |  |  | **China** |  |  |  |
| **Year** | **ExpBr** | **ImpBr** | **ExpMBr** | **ImpMBr** | **ExpCh** | **ImpCh** | **ExpMCh** | **ImpMCh** |
| **1995** | 45.19 | 54.76 | 24.88 | 39.41 | 104.84 | 109.94 | 92.38 | 86.03 |
| **1996** | 45.44 | 54.90 | 25.01 | 39.00 | 108.43 | 112.34 | 95.60 | 89.27 |
| **1997** | 49.03 | 62.52 | 27.10 | 46.85 | 124.48 | 111.97 | 110.99 | 87.58 |
| **1998** | 47.10 | 58.38 | 26.65 | 45.02 | 126.80 | 110.97 | 116.81 | 89.75 |
| **1999** | 43.63 | 48.08 | 24.11 | 37.15 | 135.89 | 128.40 | 126.41 | 102.93 |
| **2000** | 48.52 | 49.25 | 29.08 | 37.01 | 169.59 | 161.22 | 156.79 | 124.44 |
| **2001** | 48.06 | 48.22 | 26.96 | 37.07 | 176.42 | 173.33 | 164.01 | 136.14 |
| **2002** | 49.02 | 39.73 | 26.82 | 29.81 | 211.59 | 199.44 | 199.37 | 159.78 |
| **2003** | 57.03 | 39.93 | 30.70 | 28.68 | 280.74 | 278.92 | 267.63 | 221.90 |
| **2004** | 72.46 | 49.53 | 41.10 | 34.59 | 369.77 | 365.68 | 356.06 | 279.15 |
| **2005** | 84.10 | 55.04 | 47.90 | 38.42 | 459.89 | 408.42 | 446.47 | 303.10 |
| **2006** | 93.73 | 63.97 | 50.62 | 43.64 | 560.02 | 468.00 | 546.50 | 341.64 |
| **2007** | 105.29 | 80.41 | 53.60 | 51.08 | 692.56 | 553.38 | 680.22 | 387.76 |
| **2008** | 119.51 | 107.84 | 59.95 | 73.66 | 782.49 | 630.01 | 770.46 | 409.00 |
| **2009** | 86.81 | 80.95 | 39.25 | 59.41 | 651.10 | 571.03 | 646.53 | 380.88 |
| **2010** | 111.65 | 110.07 | 48.91 | 77.23 | 837.16 | 779.52 | 832.86 | 500.25 |
| **Average** | **ExpBr** | **ImpBr** | **ExpMBr** | **ImpMBr** | **ExpCh** | **ImpCh** | **ExpMCh** | **ImpMCh** |
| **1995-2010** | 69.16 | 62.72 | 36.41 | 44.88 | 361.99 | 322.66 | 350.57 | 231.23 |
| **1995-2001** | 46.71 | 53.73 | 26.26 | 40.22 | 135.21 | 129.74 | 123.29 | 102.31 |
| **2012-2010** | 86.62 | 69.72 | 44.32 | 48.50 | 538.37 | 472.71 | 527.34 | 331.50 |

**Source: IMF (2012)**

**Annex III – Brazilian exports to China (US$ of 2000)**

|  |  |  |
| --- | --- | --- |
| **Year** | **EXPBRCH** | **EXPBRCHMAN** |
| 1995 | 1.36 | 0.34 |
| 1996 | 1.22 | 0.28 |
| 1997 | 1.17 | 0.21 |
| 1998 | 0.96 | 0.14 |
| 1999 | 0.70 | 0.14 |
| 2000 | 1.09 | 0.23 |
| 2001 | 1.85 | 0.51 |
| 2002 | 2.41 | 0.59 |
| 2003 | 4.24 | 1.44 |
| 2004 | 4.96 | 1.09 |
| 2005 | 6.03 | 1.26 |
| 2006 | 7.18 | 1.13 |
| 2007 | 8.93 | 1.29 |
| 2008 | 13.12 | 1.49 |
| 2009 | 16.21 | 2.05 |
| 2010 | 24.28 | 1.69 |
| Average |  |  |
| 1995-2010 | 5.98 | 0.87 |
| 1995-2001 | 1.19 | 0.26 |
| 2002-2010 | 9.71 | 1.34 |

**Source: IMF (2012)**

1. China’s re-emergence as a global power has been considered part of a broader process, which is the consolidation of Asia as the most dynamic growth pole of the globalized economy (Yang, 2006; Canuto and Giugale, 2010; Timmer *et al*. 2011; Pettis, 2013). In 2012, Asia’s shares in world population, income and exports were, respectively, 55%, 34% and 30% (Unido 2012; IMF, 2013; World Bank, 2012). [↑](#footnote-ref-1)
2. Asia 9 = China, India, Korea, Philippines, Indonesia, Hong Kong, Thailand, Singapore and Malaysia. [↑](#footnote-ref-2)
3. AL 7 = Mexico, Brazil, Argentina, Colombia, Chile, Peru and Venezuela. [↑](#footnote-ref-3)
4. G7 = United States, Japan, Germany, Italy, United Kingdom, France and Canada. [↑](#footnote-ref-4)
5. In 1980, Asia 9’s share of the world exports was 4.4%. In 2010, it was 27.2%. In the same timeframe, AL7’s share decreased from 6.7% to 5%. [↑](#footnote-ref-5)
6. See, among others: Jenkins (2010); Jenkins and Barbosa (2012); Bittencourt (2012); Leão, Pinto and Acioly (2011); Oliveira (2010 and 2012), IADB (2012), Rosales and Kuwayama (2012), Canuto, Cavallari and Reis (2013). [↑](#footnote-ref-6)
7. See, among others: Devlin, Estevadeordal and Rodríguez-Clare (2006); Blazquez-Lidoy, Rodrıguez and Santiso (2006); Castro (2008); Leão, Pinto and Acioly (2011). For a Chinese perspective, see: Xue-Lei (徐蕾 – 2011); Jiang Shixue (江时学 - 2009). [↑](#footnote-ref-7)
8. It is worth mentioning that most of South American countries already had a highly specialized production and trade structures. Countries such as Argentina, Chile, Colombia and Venezuela, among others, have had 60% to 95% of their exports concentrated in primary products. Brazil and Mexico, who have the largest manufacturing sectors in the region, experienced a structural change in their trade profile after 1970, characterized by an increase in the manufactured products’ share in total exports. Nevertheless, since 2002 primary exports share has increased, particularly in Brazil. [↑](#footnote-ref-8)
9. See, among others: Jenkins and Barbosa (2012); Bittencourt (2012); Leão, Pinto and Acioly (2011); Rosales and Kuwayama (2012), Canuto, Cavallari and Reis (2013). For a Chinese perspective, see: Su Zhenxing & Zhang Yong (苏振兴&张勇, 2011); Zhao Lihong (赵丽红, 2010). [↑](#footnote-ref-9)
10. See, among others, Greenway, Mahabir, Milner (2008); Giovannetti and Sanfilippo (2009); Wood and Mayer (2010), Giovannetti, Sanfilippo and Velucchi (2011); Lélis, Cunha and Lima (2012); Jenkins and Barbosa (2012). [↑](#footnote-ref-10)
11. The Chinese exports to Latin America are less concentrated than Brazilian exports to the same region, while Chinese exports matched Latin American imports more than Brazilian exports. Exports Concentration Index (HHI) of Brazilian exports fluctuated around 1000, between 1996 and 2008, and reached 1007 in 2008, while the same Index for Chinese exports had evolved from 895 in 1996 to 685 in 2008. In 1999, trade complementary index for Chinese exports to Latin America (excluding Brazil) was 50.9, while in 2011 it was 55.9. In the same period, the trade complementary index for Brazilian exports was, respectively, 48.9 and 42.6 (Lélis, Cunha and Lima, 2012). [↑](#footnote-ref-11)
12. Brazil is highly competitive in natural resources and natural resources intensive manufactures. The country experienced market-share gains in the world market in the 2000s. See: Bittencourt (2012); Rosales and Kuwayama (2012). [↑](#footnote-ref-12)
13. See, among others, Greenaway, Mahabir and Milner (2008) and Eichengreen, Rhee and Tong (2007) for studies of export displacement in Asian countries; Wood and Mayer (2010) and Hanson and Robertson (2008) for the situation of developing countries as a whole; Giovanetti and Sanfilippo (2009) for the case of African countries; and Giovanetti, Sanfilippo and Velucchi (2011) for the case of European countries. [↑](#footnote-ref-13)
14. For the objectives of this article, the Asian exports are composed by the aggregate of the exports of eight countries: China, India, Malaysia, Thailand, Indonesia, Singapore, Philippines and South Korea. [↑](#footnote-ref-14)
15. The year 1995 was selected as an initial point of the analysis due to homogeneous data availability for the selected countries. [↑](#footnote-ref-15)
16. The statistic detailing and the Stata exits show that the estimated models are consistent and that the chosen instruments are adequate. Such results may be provided if requested. [↑](#footnote-ref-16)
17. Similar to the “Programa Brasil Maior” (Greater Brazil Program). Further details in: http://www.brasilmaior.mdic.gov.br. [↑](#footnote-ref-17)
18. The statistic detailing and the Stata exits suggest that the estimated models are robust and the chosen instruments are adequate. The results may be provided by the authors upon request. [↑](#footnote-ref-18)
19. Brazilian exports are distributed in equal parts among Latin America, United States, Asia, and Europe, in a percentage around 20 to 25% of the total, with small variations during the analyzed period. The remaining volume goes to Africa and Middle East. [↑](#footnote-ref-19)