Brazilian Exports

Climbing Down a Competitiveness Cliff

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Abstract

This note examines in detail Brazil's export performance over the past 15 years, focusing not only on growth and composition, but also on different performance dimensions, including diversification, sophistication, and firm dynamics. The analysis uses international comparisons to better situate the Brazilian performance, and explores different databases, including firm-level data recently published by the World Bank. The note uses a recent diagnostic toolkit developed by the World Bank in order to suggest some hypotheses about the factors that have been inhibiting exports and industrial production expansion. Among the latter, it is noted how

service sectors, as the largest beneficiaries from favorable terms of trade, accommodated larger wage increases and "exported" cost pressures to other sectors of the economy. Furthermore, although a stronger currency can be appointed as one of the elements behind the lower competitiveness in Brazilian exports, sluggish productivity performance and a real wage uptrend explain a significant part of the overall loss of competitiveness. This diagnostic reinforces the importance of resuming the agenda of microeconomic reforms, increasing the investment-to-gross domestic product ratio, and advancing toward better-skilled human capital.

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Brazilian Exports: Climbing Down a Competitiveness Cliff

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INTRODUCTION

It is widely recognized that the Brazilian economy is facing considerable competitiveness challenges.² After several years of strong expansion, the recent slowdown seems related to supply-side difficulties stemming from a wide range of inefficiencies and rising costs, instead of insufficient aggregate demand. Such inefficiencies and costs have increasingly burdened economic activity and have shown signs of aggravation in recent years.

This note examines in detail Brazilian export performance over the last 15 years, focusing not only on growth and composition, but also on different performance dimensions, including diversification, sophistication, and firm dynamics. The analysis uses international comparisons to better situate the Brazilian performance, and explores different databases, including firm-level data recently published by the World Bank. This note uses a recent diagnostic toolkit developed by the World Bank (Reis and Farole 2012). The objective is to generate hypotheses to identify factors that have been inhibiting exports and industrial production expansion.

EXPORT PERFORMANCE: 1998–2011

Growth, composition, and destination

The aggregate performance of Brazilian foreign trade can be considered favorable in the last 10 years. In the wake of strong global economic growth, the expansion of international trade, as well as favorable commodity prices, Brazilian exports of goods and services grew 262 percent between 2000 and 2010, almost twice the global average, 135 percent. As a result, exports have also grown as a proportion of gross domestic product (GDP), from 10 percent of GDP in 2000 to a peak of 16.4 percent in 2004, falling back to 11.2 percent in 2010.

Brazil's export performance is less stellar when compared with other emerging countries. In fact, the Brazilian export expansion was significantly below the 439 percent growth in the other BRICS countries (a group that includes Brazil, the Russian Federation, India, China, and South Africa). Among BRICS, the most successful case was India, which increased the ratio of exports to GDP from 13.2 to 21.5 percent between 2000 and 2010, followed by China, from 23.3 to 29.6 percent during the same period. In this sense, Brazil is among the countries that have least exploited the potential of international trade (figure 1), and this picture has not changed in more recent years.

² There is controversy over how to define competitiveness. Following Krugman (1996), this note identifies competitiveness as mainly stemming from total factor productivity of the economy.

Figure 1. Exports of Goods and Services

Source: World Bank. World Development Indicators.

Trade openness in Brazil, considering the level of per capita income, is among the lowest in the world. Larger economies do tend to be more dependent on their domestic markets, and thus it should not be a surprise to see Brazil below the predicted level in figure 2. Still, when compared to other BRICS, the level of trade integration remains below the expected line, with no signs of improvement. Over the past decade, trade flow (exports plus imports) to GDP in Brazil rose from 20.2 percent in 2000 to 22.8 percent in 2010, after peaking in 2005 at 29 percent.

Figure 2. Trade to GDP (%)

Source: World Bank. World Development Indicators.

The economic benefits of greater engagement in international trade have a long-established theoretical basis—gains to trade are as much derived from imports as from exports. Increased exports bring both static efficiency gains derived from the exploitation of comparative advantages and dynamic gains in the export sector, given productivity gains generated by increased competition, economies of scale, better

capacity utilization, knowledge dissemination, and uptake of technological progress. Therefore, pursuing greater global integration of the Brazilian economy remains a challenge that, if overcome, should provide significant benefits in the medium and long terms.

The most important Brazilian exports are minerals (25.2 percent), foodstuffs (13.8 percent), and vegetables (12.3 percent). These sectors are also those with the highest average growth in the post crisis 2009–11 period. Growth rates in these sectors relative to the average for 2006–8 were significant: 77 percent, 46 percent and 50 percent, respectively. Furthermore, the mineral sector stands out with the largest share gain since the 1996–98 period. The sectors that lost share in total exports were transportation (8.4 percent), machinery and electronics (8.2 percent) and metals (8.7 percent), in that order. Interestingly, almost 70 percent of Brazilian exports are concentrated in 5 out of 15 sectors in this classification, which includes the 3 sectors that gained more participation, and 2 out of the 3 biggest losers.

One measure of sector competitiveness—revealed comparative advantage (RCA)—can be obtained by comparing the share of exports in a given sector of a country with the participation of this sector in world exports. Table 1 shows RCA ratios for different sectors; an RCA of greater than 1 indicates a revealed advantage for that sector. Thus, table 1 shows that the foodstuff, vegetable, and animal sectors are those with higher average RCA in 2009–11. However, the biggest RCA gain was in the mineral sector, followed by the vegetable and foodstuff sectors, when comparing the averages for 2006–8 with 2009–11. The greatest losses in revealed competitiveness were in footwear and skins, respectively. The footwear sector has shown a significant decrease since 1996–98.

Table 1

SECTORAL COMPOSITION (HS2) OF EXPORTS AND REVEALED COMPARATIVE ADVANTAGE

Type	Value 1996–98	Value 2006–8	Value 2009–11	Share 1996–98	Share 2006–8	Share 2009–11	RCA 1996–98	RCA 2006–8	RCA 2009–11
01–05 Animal	4,410	32,901	39,885	3.0	6.8	6.7	1.2	3.9	3.6
06–15 Vegetable	16,599	48,544	72,620	11.3	10.1	12.3	3.2	3.6	3.9
16–24 Foodstuffs	25,252	55,745	81,520	17.1	11.6	13.8	5.0	4.2	4.5
25–27 Minerals	9,930	84,498	149,408	6.7	17.5	25.2	0.9	1.0	1.4
28–38 Chemicals	8,520	23,882	30,363	5.8	5.0	5.1	0.7	0.6	0.5
39–40 Plastic / rubber	4,534	14,084	16,323	3.1	2.9	2.8	0.7	0.7	0.6
41–43 Hides, skins	2,259	6,338	5,237	1.5	1.3	0.9	1.6	2.1	1.5
44–49 Wood	9,387	23,675	24,382	6.4	4.9	4.1	1.5	1.8	1.6
50–63 Textiles, clothing	3,663	6,797	6,999	2.5	1.4	1.2	0.4	0.3	0.3
64–67 Footwear	4,634	6,045	4,611	3.1	1.3	0.8	2.7	1.7	1.0
68–70 Stone/glass	2,008	5,959	4,800	1.4	1.2	0.8	1.1	1.3	0.9
71–83 Metals	19,887	55,069	51,345	13.5	11.4	8.7	1.4	1.1	0.9
84–85 Machinery/electr icity	18,092	53,929	48,398	12.3	11.2	8.2	0.4	0.4	0.3
86–89 Transportation	15,794	57,263	49,711	10.7	11.9	8.4	0.9	1.2	0.9
90–97 Miscellaneous	2,522	6,761	6,639	1.7	1.4	1.1	0.3	0.2	0.2

Source: World Integrated Trade Solution.

Europe, China, the United States, Argentina, and Japan are the main trading partners of Brazil, accounting for 60.9 percent of total sales in 2009–11 (table 2). The top five destinations accounted for 59.9 percent in 2006–8 and 66.9 percent in 1996–98. China has undoubtedly been the destination that has recently gained the most, up 14 percentage points from 1996–98, followed by India and St. Lucia, both up 1.4 percentage points each. Europe, the United States, and Argentina were the largest declines in shares of Brazilian exports, down 8.8, 4.2 and 3.5 percentage points, respectively.

Table 2
MAIN EXPORT DESTINATIONS

Destinations	1996–98 (%)	2006–8 (%)	2009– 11 (%)
European Union (27)	26.1	24.4	21.9
China	2.1	7.4	16.1
United States	19.1	16.1	10.3
Argentina	12.6	9.0	9.1
Japan	5.6	3.0	3.5
Chile	2.2	2.7	2.1
Venezuela, R. B. de	1.3	2.8	2.0
Russian Federation	1.3	2.5	1.9
Korea, Rep. of	1.4	1.5	1.9
Mexico	1.7	2.7	1.7
India	0.3	0.6	1.7
Saudi Arabia	0.8	1.1	1.4
St. Lucia	0.0	1.0	1.4
Paraguay	2.6	1.1	1.2
Canada	1.1	1.3	1.2
Colombia	0.9	1.4	1.1
Others	20.8	21.5	21.5

Source: World Integrated Trade Solution.

Diversification of exports

The recent global economic crisis has highlighted the importance of diversification (products, markets, and firms) to reduce risks associated with growth volatility. On the other hand, recently intensified globalization has contributed to a resurgence of specialization in diverse economies. Although predicted by trade theory, the degree of vertical specialization has surprised many with its intensity, which emerged from increasing fragmentation of trade in global supply chains. Consequently, economic diversification is now a high priority on the policy agenda for most developing countries.

Brazil is recognized as a global trader, endowed with a wide range of natural resources along with a well-diversified industrial structure. This translates into an impressive level of export diversification, not only in terms of number of destinations, but also of products. When compared with other countries (figure 3),

the Brazilian economy proves to be able to sell a large number of products in many markets. This suggests a considerable potential to be explored in terms of export growth, since the initial fixed costs to start new markets have been largely overcome.³

Figure 3. Product and Markets (2008–10)

Source: World Integrated Trade Solution.

Figure 4. Markets and Products—the Herfindahl Index (2008–10 and 1998–2000)

Source: World Integrated Trade Solution.

As a way to evaluate the recent evolution of Brazil's export diversification, we calculated the Herfindahl Index for a group of countries (figure 4)—the lower the index, the less concentrated the export basket, the greater the level of diversification. In terms of markets, the index showed a reduction in the degree of

³ For a discussion on this topic, see Melitz (2003).

concentration. Most of the included countries were able to increase diversification to access different markets. China's performance stands out because of the significant number of new destinations.

In terms of products, the picture is not so favorable. As in many countries, Brazilian exports showed increased concentration for products in recent years. Commodity products gained significant relevance. Other commodity exporters, such as Chile and Russia, also showed similar performance with non-negligible increases in the degree of concentration. China presented a slight deterioration, but from a low level of concentration. Anyway, as shown in figure 5, despite some worsening in recent years, Brazil still shows low levels of concentration when considering the level of GDP per capita.

Figure 5. Herfindahl Index and GDP per Capita (2008–10)

Source: World Development Indicators; authors' calculation.

Given the recent trend toward more concentration, a key question is how Brazil is dealing with international competition. Figure 6 shows the main products exported, as introduced in table 2, between 2006 and 2011. The circle size shows the representativeness of this specific product in total exports. If above the line, it shows that Brazilian sales grew more than exports of this specific product in international trade between 2006 and 2011. Therefore, among the top 20 products exported, Brazil is losing international market share in only two of them (oil exclusive crude and automobiles)—a very positive result, which reflects the high competitiveness achieved in commodity products.

Figure 6 also shows how the growth of Brazilian exports to each market can be compared with the growth of exports of all other countries to that same market. Brazil increased its participation in 11 major markets, representing 58.7 percent of the total, with exception of the United States, Chile, and Argentina. Thus, we can argue that Brazil gained presence in most markets, as well as in more relevant products. Interestingly, Brazilian export growth to China more than doubled the other countries' expansion in the recent period. This performance has a direct connection with the increasing Chinese demand for commodities.

Figure 6. Relative Growth: Markets and Products

Source: World Integrated Trade Solution; authors' calculation.

A cross-country gravity model can be used to evaluate Brazil's pairwise export relationships with its trading partners. The model uses bilateral export values between 2005 and 2010.⁴ Based on a theory-grounded model, this exercise allows us to compare pairwise observed export relationships with the predicted value from the gravity equation. Figure 7 shows all bilateral trade relationships in the dataset of 181 countries (light grey dots). Brazil's bilateral exports are colored in blue, and key trading partners are labeled according to their 3-digit ISO (International Organization for Standardization) code in red.

If an observation is above (below) the 45-degree line, the observed export relationship in the period is more (less) than what the gravity model predicts and the exporter is said to be overtrading (undertrading) with its trading partner. Controlling for size of trading partners, trade frictions, sample selection and firm heterogeneity, this analysis suggests that the country is trading above the predicted level with China and Russia. Interestingly, although the gap between actual and predicted exports with Russia is shrinking over time, the gap with China seems to have increased lately (table 3). On the other hand, Brazil trades less than what the model predicts with the United States, with actual exports lagging predicted exports by about 5 percent over most of this period.

⁴ Specifically, the model used bilateral exports for 181 countries for each year between 2005 and 2010. The gravity equation regresses observed bilateral exports against the following bilateral characteristics: distance, contiguity, common language, colony, common colonial power, as well as country of origin and country of destination fixed effects. This model also incorporates three innovations to the standard model. *First*, a measure of remoteness is computed by summing distances weighted by the share of GDP of the destination in world GDP. This is to take note of the fact that relative distances matter greatly, alongside absolute distances. *Second*, the model controls for zero trade flows with the use of the Heckman sample selection correction method. When observations with nonexistent bilateral trade are dropped, as ordinary least squares (OLS) does, the dependent variable is not really measuring bilateral trade, but one *contingent* on an existing relationship. An important variable left out of the model therefore is the probability of being included in the sample, that is, having a nonzero trade flow. To the extent that the probability of selection is correlated with GDP or distance, this has the potential to bias OLS estimates. *Third*, following Helpman, Melitz and Rubinstein (2008), the model controls for firm heterogeneity without using firm-level data, utilizing the fact that the features of marginal exporters can be inferred from the export destinations reached. With these steps, the gravity results are better grounded on modern trade theory.

Figure 7. Gravity Model: Actual versus Predicted Exports, 2010

Source: Authors' calculation.

Table 3
BRAZIL: ACTUAL-TO-PREDICTED EXPORT VALUES, 2005–10

Destination	Average, 2005–10	2005	2006	2007	2008	2009	2010
China	1.09	1.06	1.07	1.11	1.09	1.10	1.11
United States	0.96	0.96	0.96	0.97	0.96	0.95	0.94
Argentina	1.04	1.04	1.05	1.07	1.03	1.02	1.02
Russian Federation	1.10	1.11	1.09	1.12	1.12	1.09	1.07
India	0.99	1.02	0.96	0.96	0.95	1.03	1.00
Paraguay	0.97	0.96	0.97	1.03	0.97	0.96	0.96
Uruguay	0.96	0.95	0.96	0.97	0.96	0.98	-

Source: Authors' calculation.

Next, the analysis used the same gravity model, but this time pooled bilateral data for all years (2005–10) and added year fixed effects in addition to country of origin and country of destination fixed effects. This alternative gravity model confirms that Brazil trades above the predicted level with China in each year, and undertrades with the United States (figure 8).

Figure 8. Gravity Model: Actual versus Predicted Exports, 2010

Brazil: Actual vs. Predicted Exports to China
(2005–10)

Brazil: Actual versus Predicted Exports to United
States (2005–10)

Source: Authors' calculation.

Sophistication and technological content of exports

A widely discussed issue in recent literature is whether what a country produces and exports have relevance for economic development. Rodrik (2007) and Hausman, Hwang, and Rodrik (2007) are among those who argue that certain sectors generate greater opportunities to growth due to increased potential for vertical upgrade within the sector/product, and from benefits associated with knowledge spillovers.

Using Lall classification to assess the technological content of the Brazilian exports, there is a clear reduction in the share of high-technology products in recent years. At the same time, primary- and resources-based products gained significant importance between 2000 and 2010. The share of the latter increased from 45.7 percent in 2000 to 62.9 percent 10 years later (figure 9). On the other hand, the share of high-technology products decreased from 10.4 to 5 percent in the same period. Low-technology product exports also declined in shares, moving from 13.4 to 9.9 percent between 2000 and 2010.

The decrease in the share of high-technology product exports could have been the result of the excellent performance of commodity products in Brazil. However, this does not seem to be the case: when focusing only on the performance of high-technology international sales, there is only very modest growth. Between 2000 and 2010, Brazilian high-technology product exports expanded by 36 percent, a much lower growth rate than the one of the groups linked to natural capital endowments. If this performance is compared with other BRICS, Brazil is among the weakest, along with Russia. In the same 10 years, China and India increased exports of those products by 873 and 389 percent, respectively. In 2000, Brazil exported about 14 percent of Chinese high-technology exports and 290 percent of India's, whereas these figures dropped to 2 percent and 80 percent, respectively, in 2010.

Figure 9. Export Technological Content

Source: World Bank, World Development Indicators.

Another way to evaluate the export sophistication would be through the EXPY index (Hausman, Hwang, and Rodrik 2007). This measure considers the income level of the countries that produce any particular good to estimate the sophistication of that specific product.

Brazil showed no gains in sophistication in recent past, as seen in figure 10. The same behavior can be observed in other Latin American countries. This result is not surprising, given the recent growth pattern observed in both RCAs and technological content of exports.

Figure 10. Brazil and Latin America (2004–10): EXPY Index

Source: Authors' calculation.

Note: The choice of countries in this case is limited by the availability of information in the World Bank database.

Firm-level dynamics of exports

The recent public availability of microdata allows crucial evaluation of export performance, that is, the entry, exit, and survival dynamics of firms in global markets. Export survival sustainability—first addressed by the seminal work of Besedes and Prusa (2006)—is a key dimension to understanding export performance, and has become an important factor for policy makers to consider in the design of policy to promote exports.

The World Bank has recently assembled an Exporter Dynamics Database that includes exporter characteristics and exporter growth measures based on firm-level customs information from 38 developing and 7 developed countries, primarily for the period between 2003 and 2010.⁵ The use of this database makes it possible to compare Brazilian exports with other middle-income economies in the world (results are shown in figures 11–13).

The survival rate of exporters in Brazil stood at very high levels during 2003–9 (figure 11), only lower than levels observed in Turkey. While this result can be considered positive, it reflects a small and decreasing entry rate of firms into foreign trade. The entry rate of exporters was already low in Brazil, and dropped further to 22 percent, much lower than the values observed in countries chosen for comparison (around 35 percent).⁶

That result—a matter of concern—also confirms other indicators recently released by the Ministry of Development, Trade and Tourism for Brazil.⁷ Several studies, such as Clerides, Lach, and Tybout (1998) for Colombia, Mexico and Morocco, or Bernard and Jensen (1999) for the United States, present convincing evidence that new exporters are on average more efficient than nonexporters. Low and decreasing entry rates can be associated with low productivity at the firm level and/or high costs to export. In any case, this is a point that requires more detailed diagnosis to guide policy actions.

Lack of integration into global value chains can possibly explain the low levels of dynamism in the export sector. The emergence of global production networks has changed the world trade landscape, and this has been a driving force behind emergent trade powerhouses, many of them located in Asia.

Latin America, especially the southern countries, has not been an active participant in this new trade arrangement. The extent to which Brazil is out of the global supply chain can be gauged, at least partially, by looking at trade in parts and components. Looking at trade in parts and components also helps distinguish between assembly activities and participation in value chains. It is likely that a country exporting finished product might have just assembled high-value intermediate inputs made elsewhere. As such, rising imports of parts and components indicate a country's increased assembly activity, whereas a rise in their exports suggests its growing importance in the global supply chain.

⁵ See Cebeci and others (2012) for a full and detailed description of the database.

⁶ Cebeci and others (2012) argued that Brazil presents the lowest entry rate among 44 countries in the above-mentioned database.

⁷ *Estado de São Paulo*, August 3, 2012 (editorial).

Figure 11. Exporter Survival Rate (one year, 2003–9)

Source: Export Dynamics Database; authors' calculation.

Figure 12. Exporter Entry Rate (one year) (2003–9)

Source: Export Dynamics Database; authors' calculation.

Figure 13. Exporter Exit Rate (one year) (2003–9)

Source: Export Dynamics Database; authors' calculation.

Figure 14 presents the average annual growth of parts and components exports over the precrisis period (1998–2008). The figure includes 32 countries that showed good export performance in the period, not considering oil exports. All 32 export performers saw their parts and component exports grow during the 1998–2008 period. Among the countries with highest growth in parts and components are two Eastern European countries, Albania and Bosnia and Herzegovina, one Latin American country, Nicaragua, and two countries from East Asia, China and Vietnam. As expected, Brazil, like other South American countries included in the list, is among the countries that had the lowest growth in parts and components exports during the period.

Figure 14. Export Growth of Parts and Components (1998–2008)

Source: World Integrated Trade Solution; authors' calculation.

RESULTS OF COMPARATIVE ANALYSIS OF BRAZILIAN EXPORTS

Composition effects on export growth

To argue that a country is "more competitive" in foreign trade than other countries just because of their better export performance is obviously too simplistic. Even using relative performance in terms of market participation can lead to misinterpretations. First, export growth can be associated with the existence of composition effects (pull) and also performance effects (push). Two countries may have equally competitive exporters, but export performances can be different in the short and medium term due to different composition of exports in terms of geographical and sector composition of export baskets.

To better analyze this issue, export growth is decomposed using a methodology developed by the International Trade Department of the World Bank.⁸ Table 4 shows the main findings of such a decomposition, comparing Brazil with the other BRICS, the MIST group (Mexico, Indonesia, the Republic of Korea, and Turkey), and with the United States, the European Union, and Japan for the period 2005–11, as well as for the post crisis subperiod, 2009–11.

The main findings presented in table 4 are:

- (i) Between 2005 and 2011, the average annual growth of Brazilian exports reached almost 15 percent, with its world market share rising by 5.6 percentage points. This increase in market share is the second highest among the countries selected for comparison, equivalent to India and below only the performance of China.
- (ii) The composition effect is important to explain Brazilian export performance between 2005 and 2011. The sum of geographical and sector effects in Brazil (3.3 percent) is the second highest, lower only than the impact observed in Russia, where a sector composition effect (petroleum) is extremely high.
- (iii) For the same period, the geographical composition effect predominated in the Brazilian case, which has to do with the fast growth of the Chinese economy—which explains why only Korea has a geographical effect more intense than Brazil's.
- (iv) Excluding the composition effects, the growth in the share of Brazilian exports associated more directly to competitiveness is reduced to 1.8 percent on average per year, still significant, but less than several of the other BRICS (China and India) and MIST (Mexico and Turkey) countries.
- (v) The strong export growth in the postcrisis subperiod was widespread, with developing countries (BRICS and MIST) gaining market shares (except Turkey), and, in parallel, developed countries losing shares.

⁸ The method consists of three main steps, as described in Gaulier, Taglioni and Zignago (2012). First, it computes the so-called "mid-point growth rates" of exports (Davis and Haltiwanger 1992). The advantage of using these growth rates is that, unlike more traditional measures of export growth, they account for the extensive margin of trade, even at the finest level of disaggregation. Second, starting from a data set disaggregated by destination and sector (or product), the export growth is decomposed into a sector effect, a geographical effect, and a pure competitiveness effect. Specifically, it regresses the mid-point growth rate on three sets of fixed effects, that is, exporter, importer, and sector/product fixed effects—here denoted with the letter *f* by means of a weighted OLS estimation. Third, it computes the indices from estimated coefficients, after normalizing the coefficients and standard errors (see Gaulier, Taglioni and Zignago [2012]).

- (vi) Finally, excluding the composition effects, the growth participation of Brazilian exports after the global financial crisis that can be linked to competitiveness was only 1.1 percent, the lowest among developing countries (including Turkey, which faces strong negative composition effects in that period).

These results suggest that, despite the recent aggregate good performance, Brazilian exports were mostly benefiting from geographical and sector composition effects. Excluding these favorable environment effects, the "pure" export performance is still positive, but of much lower intensity, and smaller than some of its major emerging market competitors.

Table 4
EXPORT GROWTH DECOMPOSITION: BRAZIL (FIRST QUARTER 2005 TO THIRD QUARTER 2011)

	Export growth (%)	Export market share change (%)	Performance (export growth without composition effects) (%)	Pull factors (specialization, composition effects), of which:		Push factors (export market share growth without composition effects), of which:		
				Geo-graphical (%)	Sectoral (%)	Overall (value) (%)	Price component (%)	Volumes component (%)
G-3								
European Union (EU27)	6.7	-0.8	7.7	-0.8	-0.2	-2.0	-0.9	-1.1
—of which Euro Area (EA17)	6.4	-3.5	7.5	-0.8	-0.3	-2.2	-1.0	-1.2
Japan	6.2	-3.8	5.5	1.7	-1.1	-4.2	0.5	-4.6
United States	7.4	-1.9	5.6	1.6	0.3	-3.6	-0.4	-3.2
BRICS								
Brazil	14.9	5.6	11.7	2.1	1.1	1.8	2.6	-0.8
Russian Federation	12.4	3.0	8.4	0.9	3.1	-1.2	0.6	-1.8
India	14.9	5.5	14.4	0.4	0.0	4.6	-1.7	6.4
China	17.3	7.9	20.1	-0.2	-2.6	10.3	1.4	8.8
South Africa	12.1	2.7	10.6	0.9	0.6	1.0	0.1	0.8
MIST								
Mexico	9.9	0.5	13.3	-4.7	1.3	4.1	1.4	2.6
Indonesia	12.5	3.1	10.8	0.3	1.5	1.1	0.3	0.8
Korea, Rep. of	11.4	2.1	11.1	2.5	-2.2	1.6	-2.5	4.1
Turkey	11.8	2.4	13.1	1.0	-2.4	3.6	0.6	3.0

Source: Authors' calculation.

Note: Figures are in average annual growth.

Table 5
Export Growth Decomposition: Brazil (first quarter 2009 to third quarter 2011)

		Export growth (%)	Export market share change (%)	Performance (export growth without composition effects) (%)	Pull factors (specialization, composition effects), of which:		Push factors (export market share growth without composition effects), of which:		
					Geo-graphical (%)	Sectoral (%)	Overall (value) (%)	Price component (%)	Volume component (%)
G-3									
European Union		6.9	-2.9	9.0	-1.6	-0.5	-0.6	0.0	-0.6
of which Euro Area		5.8	-4.1	7.4	-1.3	-0.3	-2.2	-0.4	-1.7
Japan		7.4	-2.4	4.5	3.6	-0.6	-5.1	2.4	-7.2
United States		6.5	-3.3	5.1	1.2	0.2	-4.3	-0.8	-3.7
BRICS									
Brazil		13.2	3.4	11.2	0.8	1.2	1.1	0.6	0.4
Russian Federation		18.4	8.6	16.0	-0.8	3.3	5.2	0.9	4.3
India		16.3	6.5	13.9	-1.3	3.8	3.3	0.5	2.8
China		11.8	2.0	15.9	-0.2	-3.9	6.1	-0.7	6.9
South Africa		14.4	4.6	13.0	2.2	-0.8	2.6	-0.9	3.5
MIST									
Mexico		12.3	2.5	15.5	-3.0	-0.2	5.6	-0.3	6.0
Indonesia		17.1	7.3	14.9	1.0	1.2	4.4	1.8	2.6
Korea, Rep. of		15.7	5.9	12.8	4.3	-1.4	2.4	0.2	2.2
Turkey		8.7	-1.1	12.5	-1.4	-2.4	2.8	-1.9	4.8

Source: Authors' calculation.

Note: Figures are in average annual growth.

Exports and import penetration: Sector analysis

Leading up to the global financial crisis, the export share of Brazilian industrial production was on an upward trend. In 2000, the export coefficient marked 12.3 percent, reaching a peak in 2006 at 20.4 percent, and dropping to 17.5 percent in 2010 (figure 15). A first possible explanation for this performance could be that Brazil lost international competitiveness in recent years. This argument is reinforced by the fact that, as noticed earlier, the country lost RCA in 11 out of 15 sectors between 2006–8 and 2009–11.

A second possible reason is the impact of the lack of dynamism in the global economy, which could have reduced demand for Brazilian products. The gains from diversification into new markets could have been a reflection of lower growth in developed countries. But, because the model estimated off the composition effects, the “pure competitive” growth disappointed. Third, strong internal demand could have been absorbing part of the production exported in the past. However, the share of apparent consumption had been progressively met by imports, while industrial production showed poor performance.

In this sense, there is new evidence of supply-side inability to deliver to buoyant domestic demand, in addition to the sluggish world economy. In fact, the penetration coefficient (share of imports on apparent consumption) has risen significantly, from 13.4 to 20.3 percent between 2000 and 2010.

Figure 15. Penetration Coefficient and Export Coefficient

Source: National Industry Confederation.

Analyzing penetration and export coefficients by sectors shows the same pattern (figure 16). There was an increasing provision through imports of domestic demand, with a concomitant reduction in the amount exported from 2000 to 2010. In general, greater import penetration is concomitant to higher export coefficients. However, there was a shift in this pattern between 2000 and 2010. For a given level of penetration, the amount exported was less expressive. Again, this evidence tends to support the hypothesis of a lack of competitiveness on the supply side as a relevant factor to explain recent lackluster performances of industrial production and exports rather than a case of weakening of domestic demand.

Figure 16. Penetration Coefficient and Export Coefficient: Sector Perspective

Source: National Industry Confederation; authors' calculation.

ELEMENTS POTENTIALLY ASSOCIATED WITH LOW COMPETITIVENESS

Low productivity gains

Low productivity gains in recent years have become a central issue for the low trade competitiveness exhibited by the Brazilian economy. Contrary to the pattern observed in the past, labor productivity in the industrial sector lagged behind the overall productivity of the economy in recent years (figure 17). Additionally, overall labor productivity recently showed signs of accommodation, generating serious concerns. Improvements in the efficiency of service sectors are central to improving the productivity of all other economic sectors.

Figure 17. Industry and GDP: Evolution of Labor Productivity

Source: National Industry Confederation; Central Bank of Brazil; authors' calculation.

Terms of trade and employment level

Wealth effects resulting from favorable terms of trade are among the main driving factors of Brazil's recent economic growth. The gain in terms of trade has been approximately 40 percent since 2004 (figure 18) and helps explain the strong dynamism on domestic consumption, alongside the demographic bonus and the emergence of a new middle class stimulated by social inclusion policies.

However, the terms-of-trade impact differs between tradable and nontradable sectors. Foreign competition restricts the ability of local industry to pass through increasing costs, even in an environment of strong internal demand. However, because service sectors can set prices much more easily, its power to dispute production factors internally is higher. This issue is especially important as the economy approaches full employment.⁹

One way to examine these effects is through the perception of different wage gains by consumers and producers. Accordingly, we deflated nominal wages not only by the index of consumer prices (IPCA), but also by the GDP deflator for the specific sector (figure 19). On one hand, gains realized by consumers can be gauged by deflating wages by the IPCA. Clearly, the latter benefited from higher terms of trade. On the other hand, producers may take partial advantage of better prices and pay higher wages, alleviating some of cost pressures. Demand for labor can still be argued as greater than in the absence of this external shock, as the economy moves toward full employment.

Figure 18. Terms of Trade

Source: Funcex (<http://www.funcex.org.br>).

For example, service sectors benefit from stronger domestic demand and can accommodate larger wage increases. From 2004 to 2011, real wage gains perceived by consumers were about four times stronger

⁹ Salter (1959) and Corden and Neary (1982) have interesting discussions on this topic.

than as perceived by service sector suppliers. Thus, this sector could expand its employment above what would have been the case in the absence of the wealth shock, which helps to explain the good momentum in employment generation and in domestic demand.

The same kind of dynamic was noted on the side of industry, although a much less significant one. Because some companies are linked to commodity sectors, for example, the mining industry, a few benefited from better terms of trade. However, international competition through increased imports constrained the overall industry to benefit in the same way from wealth effects. Thus, cost pressures coming from the dispute for production factors, although spreading on all sectors, revealed to be much more intense in non-commodity-related industrial sectors.

Figure 19. Real Average Wages

Source: Instituto Brasileiro de Geografia and Estatística (IBGE); authors' calculation.

Unit labor costs

Increases in average real wages concurrent to stagnant or falling labor productivity negatively affected Brazil's export competitiveness. Pastore, Gazzano, and Pinotti (2012) argued that higher unit labor costs represent a major source of momentum loss in industry growth since 2010. As presented earlier, both trends have been observed in Brazil after its fast recovery from the most recent global crisis.

However, this effect was not observed before 2010, excluding the recessionary period, and can be characterized as an *additional* negative shock to export performance in recent years (figure 20). As noted earlier, higher real wages from an industrial perspective were milder than that shown in figure 19, given improving terms of trade. However, although better terms of trade mitigated the impact of higher unit labor costs, we estimated that it alleviated this uptrend by about one-fourth after 2010. Putting it

differently, a significant increase in unit labor costs does indeed partially explain the loss in industrial competitiveness, but only for the more recent period.

Figure 20. Unit Labor Cost in Industry Sector

Source: National Industry Confederation; authors' calculation.

Exchange rates

Many economists have highlighted exchange rate appreciation as a major factor explaining the recently disappointing export and industrial performances in Brazil. The general trend of appreciation is evident considering the levels achieved earlier in the decade. Actually, given the significant gain in terms of trade, it should not be unexpected to see a strengthening of the real exchange rate.

In fact, the real effective exchange rate index appreciation is certainly not negligible (figure 21). Taking the average of 2000/2001 biennium as the base, the average level throughout 2010 reached 70. Similarly, the dollar-denominated unit labor cost level reached 202 in 2010. Thus, although exchange rate appreciation seems to be one of the elements of the low competitiveness of Brazilian exports, sluggish industrial sector productivity performance and higher real wages seem to be more responsible for the current situation.¹⁰

¹⁰ Bonelli and Pinheiro (2012) present an interesting discussion on this decomposition.

Figure 21. Real Effective Exchange Rate and Unit Labor Cost

Source: Central Bank of Brazil.

Business environment and logistics costs

The economic environment has not helped Brazil face stronger competition in global markets. The World Bank Doing Business survey evaluates various countries in diverse categories. Among the 183 countries assessed, Brazil is in the bottom half in the overall ranking. Among the 10 categories analyzed by this survey, Brazil fares relatively better in only two categories: obtaining electricity (51st) and protecting investors (79th). Among BRICS, the major highlight is South Africa, which features in the top half in 8 out of 10 categories, including first in obtaining credit and tenth in protecting investors.

Doing Business indicators raise concerns about increasing expenses on international trade. The cost of dealing with containers was US\$2,215 in Brazil in 2011, compared to only US\$500 in China (figure 22). Additionally, this cost has experienced a significant uptrend, which has not been observed in other BRICS. While cost comparisons should be always considered with care, the difference in the figures is striking.

The World Bank also compiles the Logistics Performance Index (LPI) to help policy makers and the private sector jointly identify the main challenges to entering into global supply chain. The LPI measures on-the-ground trade logistics, factoring in: (i) border control efficiency; (ii) quality of trade and transport infrastructure; (iii) international shipment competitiveness; (iv) quality of logistics services, ability to track consignments; and (v) timeliness of deliveries. Each score was averaged to compose one index and used to rank 155 countries in 2007, 2010, and 2012.

Regarding the LPI, Brazil climbed 20 positions to 41st from 2007 to 2010, but lost ground to 45th in 2012. Improvements came from all pillars in the 2007–12 period, but mainly from better tracking and trace capacity. In the last two years, the Brazilian position deteriorated significantly in timeliness of shipments and logistics services, and mutely in quality of trade and transport-related infrastructure. Among the BRICS, Brazil is behind South Africa (23rd) and China (26th) in all categories, just ahead of India (46th), but clearly in front of Russia (95th). Brazil holds the 4th position in BRICS in 3 pillars: customs, logistics competencies and timeliness. Moreover, Brazil is 9th in the top 10 upper-middle-income countries, moving three positions down compared to 2010. The LPI results highlight that the weakest link to participation in global supply chain for Brazil comes from low speed, lack of simplicity and short predictability of border control agencies, resulting in a mediocre overall ranking for customs (78th).

Figure 22. Foreign Trade Logistics – Costs of Dealing with Containers

Source: World Bank. World Development Indicators.

CONCLUSIONS

Brazilian exports of goods and services have grown sharply in recent years, with sales nearly three times higher in 2010 than in 2000. When compared to other countries, the Brazilian economy shows remarkable diversification, being able to put many different products into several markets. This suggests considerable potential to expand foreign sales, because sunk costs to reach these markets have been paid.

Despite such a recent positive performance, there are major concerns with Brazil's foreign trade, as revealed by some of the indicators presented in this note:

- The survival rate for exporters was at fairly high levels in 2003–9, but the reality is that this indicator reflects a low and decreasing entry of firms in export markets. The entry rate was already low in Brazil, compared to selected peers, and recently dropped even more.
- Brazilian exports benefited significantly from geographical and sector composition effects. Once these effects are excluded, the pure export performance is still positive, but much less intense and lower than in some of the major emerging countries.
- The assessment of Brazilian exports in terms of sophistication suggested a clear decline in the share of products with higher technological content. Primary and resources-based products have gained significant weight between 2000 and 2010. The fallen share of high-technology products reflects its poor absolute performance, and not just the success of commodity-related exports.

This assessment confirms that there are significant cost pressures and competitiveness issues affecting the industrial sector, not only with respect to foreign trade, but also domestically. The findings here support the hypothesis that the challenges to a better export performance are more linked to the supply-side agenda, rather than to export-promotion types of policy.

When considering potential elements associated with the revealed declining competitiveness, policies aiming at higher productivity are crucial to better compete globally and domestically. To strengthen industry productivity, broad measures to improve the efficiency of service sectors are important. Thus, a wide effort on the supply side will be necessary, rather than just short-term stimulus or focused policies favoring some export sectors.

Favorable terms of trade can be cited as a key economic driver through their wealth effects. The impact of this shock helps explain the higher economic dynamism based on domestic consumption. Service sectors, as the largest beneficiaries, could accommodate larger wage increases, given their ability to mark up prices, maintaining/creating jobs, but “exporting” cost pressures to the other sectors of the economy.

The combination of rising real average earnings and stagnant (or falling) labor productivity has harmed Brazil’s export competitiveness, particularly the industrial sector’s capacity to compete with imports. The sharp increase in unit labor costs is part of the explanation of that weakness, although only for recent quarters.

The appreciation of the real effective exchange rate was certainly not negligible in the last decade. Although a stronger currency is one of the elements behind the lower competitiveness in Brazilian exports, sluggish productivity performance and a real wage uptrend explain a significant part of the current overall loss of competitiveness.

The fact that trade openness in Brazil is among the lowest in the world, considering the level of income per capita, deserves more attention. Larger economies are usually more dependent on their domestic markets, yet when compared to the other BRICS, Brazil still shows trade flow levels that are well below the predicted value. Pursuing greater global integration of the Brazilian economy remains a challenge that, if successful, can provide significant benefits in the medium and long terms.

The business environment has not helped Brazil weather stronger competition in global markets. The logistics infrastructure, which is widely recognized as inefficient and costly to Brazilian exports, as well as many other factors, such as a very complex and costly tax system, have taken a toll on Brazilian firms. This diagnostic reinforces the importance of resuming the agenda of microeconomic reforms, increasing the investment-to-GDP ratio, and advancing toward a better-skilled human capital base. Promoting and rewarding productivity gains in a competitive economy, including the service sector, are the only options to accelerate growth and overcome possible middle-income growth traps (Agenor and Canuto 2012).

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