

The Curious Case of Brazil's Closedness to Trade

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Abstract

Although Brazil has become one of the largest economies in the world, it remains among the most closed economies as measured by the share of exports and imports in gross domestic product. This feature cannot be explained simply by the size of Brazil's economy. Rather, it is due to an economic structure reliant on domestic value

chain integration as opposed to participation in global production networking. It also reflects more generally an export base that shows lack of dynamism. Opening up and moving toward integration into global value chains could produce efficiency gains and help Brazil address its productivity and competitiveness challenges.

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The Curious Case of Brazil's Closedness to Trade

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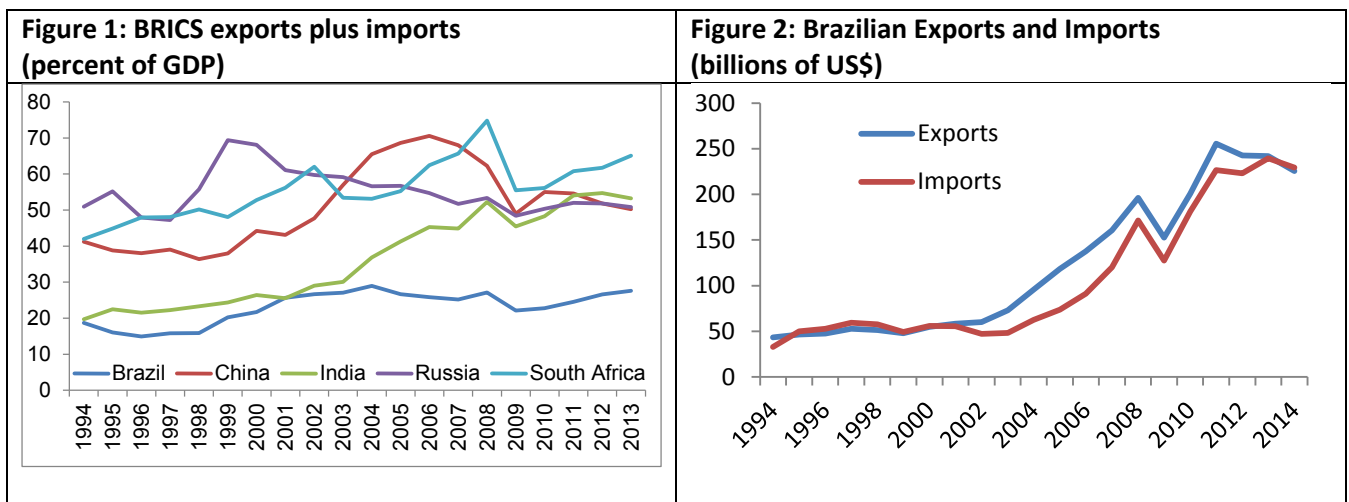
1. Introduction

As of 2012, Brazil was the country most closed to trade, by measure of trade penetration (combined share of exports and imports in GDP).¹ Although Brazil is a large economy by many measures and it is widely accepted that large economies tend to observe a relatively lower trade penetration, Brazil remains an outlier in this area. This paper shows how Brazil's closedness cannot be explained by its size or other macro-level characteristics. It further shows important firm-level indicators that help explain Brazil's closedness. Finally, the paper argues that by increasing dynamism in exporting and importing as well as integrating into global value chains, Brazil could become more productive. The rest of this paper is structured as follows: Part 2 reviews Brazil's trade aggregates over time and compares then with peer countries. Part 3 shows, through a series of univariate and multivariate regressions, that Brazil's relative closedness cannot be adequately explained by common macro indicators. Part 4 turns to firm-level data, especially the low propensity of Brazilian firms to export, as an explanation of low trade penetration. Part 5 looks into why few Brazilian firms export and Part 6 lays out how increasing trade penetration through deeper integration in global value chains could lead to increased productivity in the Brazilian economy. Part 7 concludes.

¹ This is according to WDI data for 179 countries. In 2013 Sudan, newly separated from South-Sudan was recorded with an even lower trade to GDP ratio. <http://economia.estadao.com.br/noticias/geral,brasil-e-o-pais-com-menor-importacao-imp-,984019>

2. How closed to trade is the Brazilian economy?

According to traditional macro-level measures of trade penetration (share of exports and imports in GDP), Brazil is an unusually closed economy. For Brazil this measure was only 27.6 percent in 2013, a figure among the lowest in the world. Notably, Brazil's trade openness lags far behind its peers among the BRICS countries (Figure 1), all of which reached trade-to-GDP ratios of at least 50 percent in recent years.



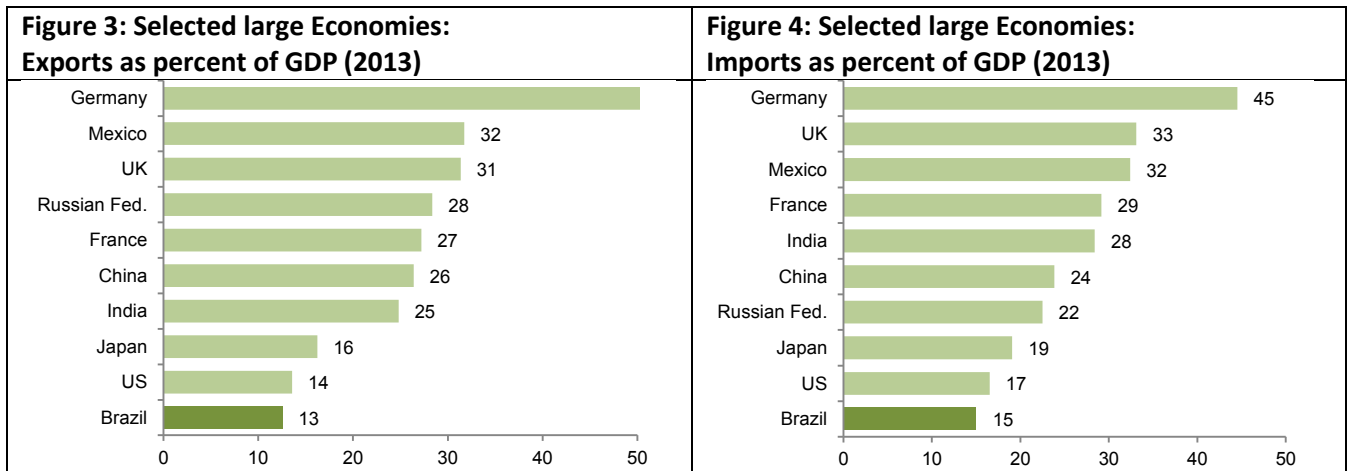
Measured in USD, Brazil's export and import values increased rapidly from 2002 to 2008, driven by the commodity boom (Figure 2). In percent of (nominal) GDP however, trade peaked in 2004 as GDP growth and exchange rate appreciation neutralized trade growth in the following years.

The collapse of trade during the global financial crisis of 2008/09 reduced Brazil's exports and imports; however, this was followed by a swift recovery in 2010 as Brazil's economy and commodity prices bounced back. Brazil's exports in USD terms peaked in 2011 but have since fallen by 11.7 percent as commodity prices have weakened. Imports continued to grow up to 2013, all but eliminating the trade surplus in goods; however they retreated in 2014 (by 4.2 percent). Hence recent increases in the

trade-to-GDP ratio are driven by the devaluation of the real, which reduces GDP measured in USD, not by increased trade.

3. Controlling for size and other macro variables

Brazil's size has long been used to explain the country's relative closedness (Dominguez, 1994). As the comparison with other large economies already indicates, this argument does not hold up to close scrutiny (Figures 3 and 4). While it is true that large economies tend to exhibit lower percentages of exports and imports to GDP, such feature fails to explain the exceptionally low levels of trade penetration observed in the Brazilian case.



Source: World Development Indicators

Looking at 2013 data from 176 countries available through the World Bank's World Development Indicators (WDI) database, the average trade-to-GDP ratio is 96 percent. Even among the six countries with a larger GDP (in constant 2005 US dollars) than Brazil, the average is 55 percent.

Using the same WDI data and running a simple, univariate OLS regression of trade penetration and GDP (logs) on all available countries, we can show that less than one-sixth (15 percent) of Brazil's

deviation from the mean can be explained by the size of its economy alone. In other words, just looking at size of GDP we would expect Brazil to have a trade-to-GDP ratio of 86 percent, three times the observed 28 percent. In addition, the coefficient for (log) GDP is not statistically significant and explains next to none of the variation in countries' trade penetration (R^2 of 0.01), shedding doubt on the correlation between size of the economy and trade openness (see Table 1 for all regression results).

Indeed, the single best indicator of country size to explain trade openness is surface area (in logs), which, in a univariate regression is highly statistically significant and explains over 20 percent of variation in countries' trade penetration. However, in the case of Brazil, regardless of its large area, this model still estimates a trade-to-GDP ratio of almost double the actual value (52 percent).

Conducting a multivariate OLS regression controlling for various dimensions of country size (surface area and population) simultaneously, Brazil's lack of openness still cannot be adequately explained: Brazil's expected trade-to-GDP ratio in this model (logs of GDP, area and population) is more than twice the actual value (62 percent). Overall, this model performs slightly better, explaining over a quarter of variation in the country's trade penetration. All three variables are statistically significant at least at the 5-percent level. Population and area have the expected negative sign, while the coefficient for GDP is positive. The positive GDP coefficient in this model is consistent with the literature (Edwards, 1997) that generally finds higher trade penetration to be associated with rising GDP per capita, an effect which we capture by including GDP as well as population.

Controlling for other structural features often associated with trade openness - such as the urbanization rate and the share of GDP produced in the manufacturing sector (Ram, 2008) - improves the fit of the model slightly, even though several coefficients lose statistical significance. For Brazil, it actually increases the expected openness slightly to 64.5 percent.

The only approach we discovered to fairly accurately predict Brazil's low level of openness is by also controlling for whether or not a country is located in Latin America and the Caribbean by adding a LAC dummy variable in the regression. The LAC factor is a highly significant, large and negative factor: LAC countries are expected to have a 36 percentage points lower trade-to GDP ratio than non-LAC countries, all else equal. This factor reduces Brazil's predicted openness to 31 percent, fairly close to the observed 28 percent. However, all this tells us is that Brazil is not alone – other Latin American countries also have a low trade penetration relative to the rest of the world (controlling for size and other characteristics). It also hints at other factors common among Latin American countries which reduce trade openness.

Table 1: Summary of Regression Results

| expimp | (1) | (2) | (3) | (4) | (5) |
|---|--------|------------|------------|------------|------------|
| lgdp | -2.595 | - | 9.291*** | 3.123 | 2.677 |
| larea | - | -10.200*** | -10.325*** | -11.127*** | -11.069*** |
| lpop | - | - | -7.999** | -3.273 | -4.711 |
| urban | - | - | - | 0.458* | 0.544** |
| manu | - | - | - | 0.842 | 0.941 |
| lac | - | - | - | - | -36.324*** |
| cons | 105.98 | 214.15 | 197.03 | 185.17 | 189.62 |
| R ² | 0.01 | 0.21 | 0.26 | 0.28 | 0.36 |
| Brazil's hypothetical openness ¹ | 85.9 | 51.5 | 61.7 | 64.5 | 31.1 |

* significant at 10 percent level

** significant at 5 percent level

*** significant at 1 percent level

¹ Trade to GDP ratio estimated for Brazil by applying the coefficients of the regression models

4. Micro-level indicators shedding light on Brazil's closedness

A more interesting perspective on Brazil's lack of trade openness can be obtained from looking at the number and characteristics of exporting firms.

The first result is that very few Brazilian firms export (World Bank, 2014). The share of exporters among all formal sector firms is less than 0.5 percent. Indeed, the absolute number of exporters in Brazil - less than 20,000 – is roughly the same as that of Norway; a country of just over 5 million people compared to Brazil's 200 million. This means that, while in Norway there is one exporting firm for about every 250 Norwegians, the ratio in Brazil is one for every 10,000 Brazilians.

Of course, Norway and Brazil are vastly different countries. Norway's is one of the richest countries in the world; its GDP per capita is almost 10 times that of Brazil. Norway's total GDP is about a quarter of Brazil's, indicating that Norway can be more aptly be described as a small open economy. Norway is also a small country close to and well connected with many more countries in its region compared to Brazil. On the other hand, Norway is also a commodity exporter, with the petroleum sector accounting for more than half of total exports. In the case of Norway, a strong natural resource sector appears to coexist with value chain integration and dynamic exporters in other sectors.

Looking at a larger set of countries, we observe that Brazil is indeed an outlier. Brazil's number of exporters relative to the population is low even when controlling for GDP per capita (Figure 5).

Figure 5: Number of exporting firms per capita versus GDP per capita (average 2006-10)

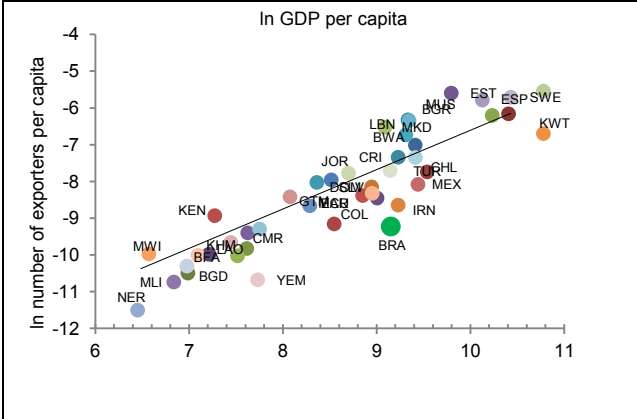


Figure 6: Distribution of Export Value among Exporting firms (percent)

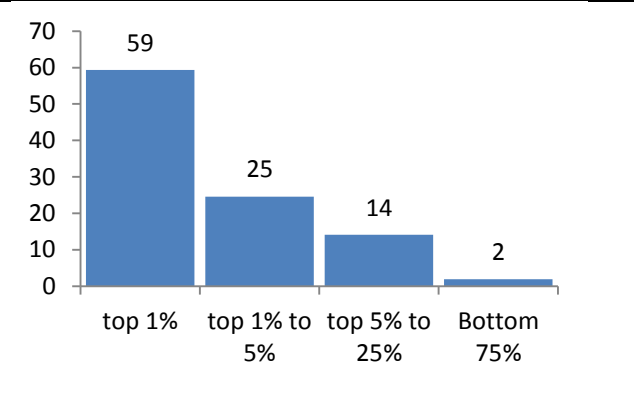


Figure 7: Entry rates versus total number of exporters (average 2006-10)

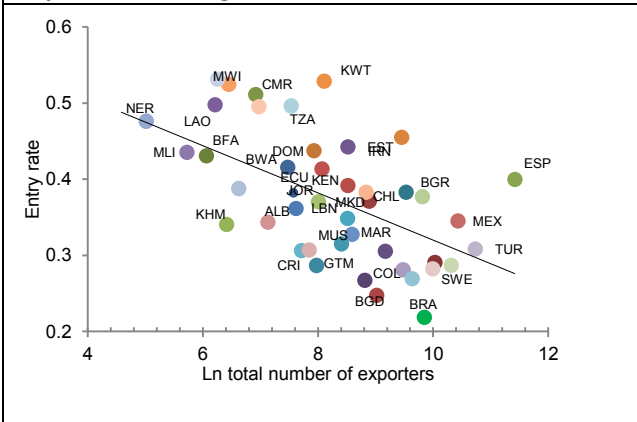
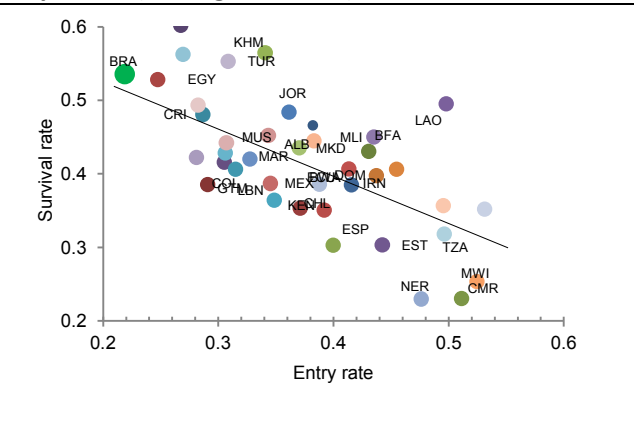


Figure 8: Entry rates versus survival rate of new exporters (average 2006-10)



Data Source: World Bank Exporter dynamics database

According to the World Bank’s Exporter Dynamics Database,² of all Brazilian exporters, a much smaller number of firms make up the overwhelming share of exports: the top 1 percent of exporting firms generates 59 percent of total exports, while the top 25 percent of firms account for 98 percent of exports (Figure 6).

² The Exporter Dynamics Database provides measures of exporter characteristics and dynamics across 45 countries across all geographic regions and income levels. The Exporter Dynamics Database contains close to 100 measures covering the basic characteristics of exporters, their distribution by size, the diversification in their products and markets, their dynamics in terms of entry, exit and survival, and the average unit prices of the goods they trade. It can be accessed at: <http://data.worldbank.org/data-catalog/exporter-dynamics-database>

We also observe little dynamism among Brazilian exporters. Even given the small number of exporters, Brazil has a very low entry rate – very few firms become new exporters. On the flip side, Brazilian exporters have a very high survival rate, meaning that the few firms that export are likely to continue doing so (Figures 7 and 8).

5. Why do so few firms export?

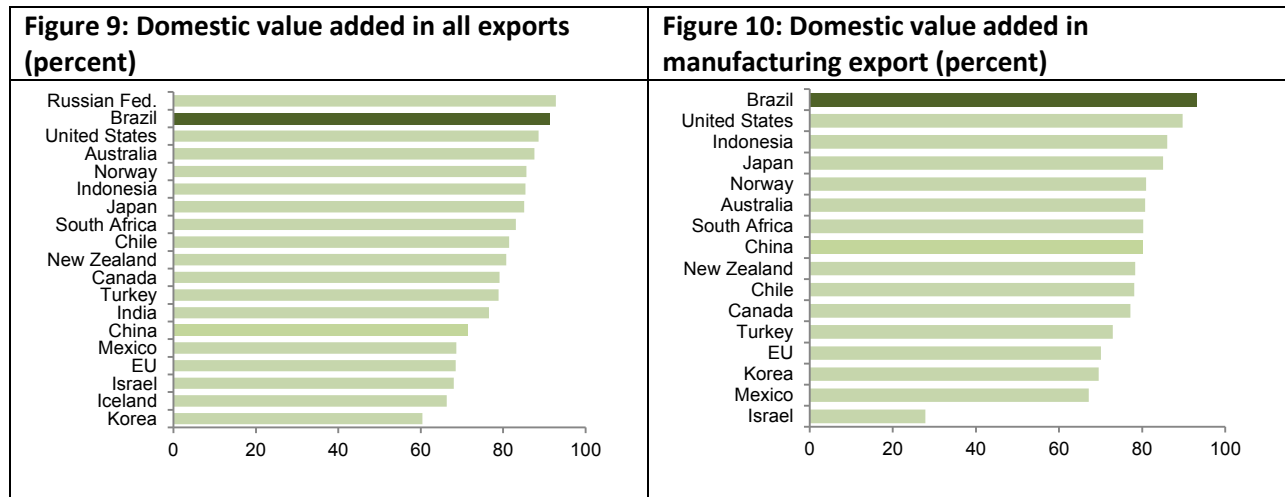
To understand why Brazil is so closed to trade and has such a small number of exporters, we will need to take a closer look at how Brazilian firms engage with the outside world. One interesting indicator is the ratio of domestic value added in exports (or its inverse, the imported content in exports).

This measure serves as an indicator of integration into transnational value chains. Countries that are integrated in those chains will show a lower share of domestic value added in exports as their exports include components and intermediate goods previously imported from other countries.

In Brazil we observe a very high share of domestic value added in total exports (Figure 9). Now this could be in part due to the fact that Brazil exports a lot of raw materials, which typically have a very high degree of domestic value added as they constitute the origin of a value chain. However, even when only looking at Brazil's manufacturing exports (about a quarter of total exports), Brazil's domestic value added is still extremely high (93 percent); indeed, it is the highest among the economies covered by the OECD-WTO Trade in Value Added database (Figure 10).³

³ The second release of the OECD-WTO TiVA database (May 2013) presents indicators for 57 economies (including all OECD countries, Brazil, China, India, Indonesia, Russian Federation and South Africa) covering the years 1995, 2000, 2005, 2008 and 2009 and broken down by 18 industries. It can be accessed at: <http://www.oecd.org/industry/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm>

Brazil's absence from global production networks and resulting density of domestic value can only in part be explained by the relative distance (geographical as well as institutional) from major economic centers – like other LAC countries. However it is also in large part a result of policy decisions past and present on trade and local content (World Bank, 2014; Canuto 2014).



Source: World Bank 2014.

The high level of domestic value added in exports shows that the fragmentation of the production process along cross-border value chains, a very important part of the second wave of globalization (Baldwin, 2011), has largely bypassed Brazil.

In part this can be explained by the difficulty encountered by firms attempting to trade across Brazil's borders. Brazil's precarious logistics and high transaction costs related to international trade are incompatible with the logic of cross-border value chains.

Over the past decade Brazilian firms have also faced serious competitiveness challenges, such as real appreciation and defensive trade policy reactions (Canuto, Cavallari, Reis 2013a, Canuto, Cavallari, Reis, 2013b). This means that only the most efficient firms or larger firms benefitting from significant

economies of scale are able to overcome barriers to export. This should explain some of the concentration of exports among a small number of large firms.

6. How could opening up support Brazil's growth agenda?

Opening up and integrating more deeply in global value chains would result in the closure of less competitive production chain segments and their substitution with imports, eliminating the deadweight loss (Feenstra, 1992) associated with inefficient domestic production. On the other hand, the businesses left standing would be more competitive, while final products available to the domestic market as well as for exports would be of lower costs and higher quality (Fleischhaker, George 2014). Furthermore, in dynamic terms, integration in global value chains would allow scarce domestic resources such as skilled labor to be reallocated to the most productive firms and activities, increasing overall productivity.

The productivity gains and cost reductions in the global economy due to participation in global production networking have been significant, increasing the opportunity cost associated with the ongoing closedness of the Brazilian economy. The alternative approach, which would be to support vertically integrated supply chains through protectionist measures, would likely be futile in the longer term. For example, despite rising trade barriers, Mercosur's coefficient of imports from China (World Bank, 2014) has continued to increase in recent years. Furthermore, private investors seem to understand this, as they shy away from activities which are viable only under permanent protection.

In Brazil, given its labor shortages and aspirations of rising purchasing power, productive activities would be strengthened by the availability of cheaper local consumer, intermediate and capital goods. Brazil's immersion in global value chains would allow the country to leverage its comparative advantages, which clearly exist in natural resource-associated industries but which could also emerge in

specific activities in manufacturing or services once industries have access to cheaper inputs. Of course, public policy support remains essential. However, this support should be more horizontal in nature, rather than further encouraging the ongoing high density of production chains (Canuto, 2014) and perpetuating the extraordinary closedness of the Brazilian economy.

7. Conclusion

While Brazil has become one of the largest economies in the world, it remains among the most closed economies as measured by the share of exports and imports in GDP. As demonstrated above, this feature cannot be explained simply by the size of Brazil's economy. Rather it reflects an export base that shows lack of dynamism with few and mostly large firms exporting and even fewer becoming new exporters. Low dynamism in turn is connected with lack of integration into global value chains, a sign that Brazil has been largely left out of the second wave of globalization. Opening up and moving toward integration into global value chains could produce efficiency gains and help Brazil address its productivity and competitiveness challenges, which have recently come into sharper focus (Canuto and Schellekens, 2014). As a bias toward closedness to trade is observed in Latin America more broadly, this insight may be useful even beyond Brazil's borders.

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