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# China and Brazil: Economic Impacts of a Growing Relationship

Rhys JENKINS

**Abstract:** The paper analyses the economic impacts of China's re-emergence on Brazil, looking at both the direct effects of China on Brazil in terms of bilateral trade and investment flows and the indirect effects through increased competition in export markets for manufactured goods and higher world prices for primary commodities. Despite a surge in Chinese FDI in Brazil in 2010, the main driver of bilateral relations is trade. While bilateral trade has grown rapidly, the pattern that has emerged has given rise to concern because Brazil's exports are concentrated in a small number of primary products while imports from China are almost entirely of manufactured goods that are becoming more technologically sophisticated over time. Brazil has benefitted in the short term from the high prices of primary commodities (partly caused by growing Chinese demand), but has lost export markets to China in manufactures, contributing to the "primarization" of the country's export basket.

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**Keywords:** Brazil, China, trade, foreign direct investment (FDI)

**Dr. Rhys Jenkins** is a professor of Economics at the School of International Development, University of East Anglia. He is a development economist with a particular interest in trade and foreign investment. His current research focuses on the impact of the re-emergence of China as a major economic power on other developing countries. He led an international project called "The Impact of China's Global Economic Expansion on Latin America", some of the results of which were published in a book co-edited with Enrique Dussel Peters, *China and Latin America: Economic Relations in the Twenty-first Century*, Bonn: German Development Institute, 2009.

E-mail: <R.O.Jenkins@uea.ac.uk>

## Introduction

China's rapid growth and increased openness over the past three decades has led to its emergence as a key player in the global economy in the early twenty-first century. GDP has grown at over 9 per cent per annum over 30 years and China is now the second-largest economy in the world. It has also increased its share of world trade significantly, overtaking Germany to become the world's largest exporter. This has had major implications for Latin American economies, of which Brazil is the most significant. The aim of this paper<sup>1</sup> is to analyse the impacts of China on the Brazilian economy in recent years.

Brazil established diplomatic relations with the People's Republic of China in 1974 under the military government but links remained relatively limited until the 1990s. In 1993 China recognized Brazil as a "Strategic Partner", the first Latin American country to receive this designation. Even before the take-off of trade between the two countries since the start of the millennium, significant cooperation was established in technical and scientific areas, most notably the joint efforts to develop remote sensing satellites (De Oliveira 2010).

In 2010 China was Brazil's largest trading partner, accounting for over 15 per cent of total Brazilian exports and supplying over 14 per cent of its imports. Brazil has become a major supplier of iron ore and soybeans to the Chinese market, and exports to China increased almost thirty-fold between 2000 and 2010. Although on nothing like the scale of trade, investment flows between Brazil and China are also increasing.

The relationship with China has been a source of considerable controversy in Brazil (Barbosa and Mendes 2006). The Lula administration was keen to develop a strong partnership with China, and the president visited China in 2004 and again in 2009 with a large delegation of ministers, governors and businesspeople; his successor Dilma Rousseff con-

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tinued this tradition, visiting China during her first hundred days in office. However, the business community has been sharply divided: Firms with interests in China, particularly through exports, formed the Conselho Empresarial Brasil–China (CEBC) in 2004 with the aim of enhancing Brazilian–Chinese economic relations. On the other hand, the Federação das Indústrias do Estado de São Paulo (FIESP) and a number of sectoral associations representing industries affected by Chinese competition have called for increased government support and for the implementation of safeguarding measures against China (Paraguassu 2007). These conflicting views illustrate the complex and contradictory nature of the impact that the global expansion of China is having on the Brazilian economy.

## A Framework for Analysing the Impacts of China

In order to make sense of this complexity, a framework has been developed to analyse the impacts of China’s growth on other developing countries (Shafaeddin 2004; Jenkins and Edwards 2006; Schmitz 2006; Kaplinsky and Messner 2008). This can be presented as a matrix:

	Complementary effects	Competitive effects
Direct effects		
Indirect effects		

It is important to recognize that because China is such a large country, its growth has an impact on the global economy, so China’s economic impact on Brazil cannot be analysed solely by looking at bilateral economic relations. It is therefore useful to distinguish between the direct effects of China on Brazil – which are the result of trade and investment flows between the two countries – and the indirect effects. As is increasingly being recognized, what happens in the Chinese economy has a major impact on the world, whether in terms of global growth, international finance or global commodity prices. These can then impact Brazil in ways that go beyond the effects of bilateral economic relations. Indeed, it is quite possible that such indirect effects are of greater significance for some economies than are direct effects.

In addition to separating the direct from the indirect effects of China on Brazil, the matrix also distinguishes between those impacts that involve a complementary relationship between China and Brazil and

those where Brazil and China are in competition with each other. The former involve “win-win” situations where both countries gain from the growth of China (Jiang 2009; Wu n.d.; Dos Santos and Zignago 2010). The latter give rise to fears that Brazil is losing out to China in global and domestic markets (Baumann 2009; FIESP 2007; FIESP n.d.). These two dimensions are also commonly expressed as “opportunities” and “threats” or “challenges” in the literature on China and Latin America (IDB 2006; Lederman, Olarreaga, and Perry 2009). This framework provides a basis both for evaluating the overall impact of China on Brazil and for understanding the conflicts that arise within Brazil over economic relations with China.

**Table 1: Economic Impacts of China on Other Developing Countries**

		<b>Complementary effects</b>	<b>Competitive effects</b>
Trade	Direct effects	Chinese demand for exports; Cheaper inputs and capital goods from China; Lower prices for consumer goods	Displacement of local producers by Chinese imports
	Indirect effects	Increased world commodity prices	Competition from Chinese goods in third markets
Foreign investment	Direct effects	Chinese FDI bringing in additional resources (capital, technology)	Displacement of local firms by Chinese investors
	Indirect effects	Integration into global production networks with China	Diversion of FDI by OECD countries from Brazil to China

Source: Author’s own elaboration based on Kaplinsky and Messner 2008: Figure 6.

The matrix can be expanded by looking separately at different types of global flows. Given that aid and migration are not significant in the relations between China and Brazil, the key flows are those of trade and foreign investment. Table 1 sets out the most important potential impacts that can arise as a result of China’s growth. As the table shows, some of the impacts – such as the growth of imports from China – can have both positive and negative effects on other countries, affecting different groups differently. In other cases, the impacts are clearly either positive or negative – for example, a loss of export markets to China (an indirect/ competitive effect) has a negative effect on Brazil.

This article uses this framework to evaluate the recent effects of China on Brazil, identifying the most important channels through which the impact of Chinese growth has been transmitted. The next section focuses on the direct effects of bilateral trade and investment between Brazil and China. The following section then turns to the indirect effects that arise from China's growing role in the global economy. For Brazil, the most significant of these indirect effects are 1) competition from Chinese manufactured goods in its major markets in the US, Europe and the rest of Latin America (a competitive effect) and 2) the increased prices for primary products exported by Brazil as a result of the surging Chinese demand for raw materials (a complementary effect). There is little evidence of an indirect effect in terms of foreign investment, so this is not addressed in the paper. Finally, the last section of the paper attempts a preliminary analysis of the impact of China on the growth and structure of the Brazilian economy.

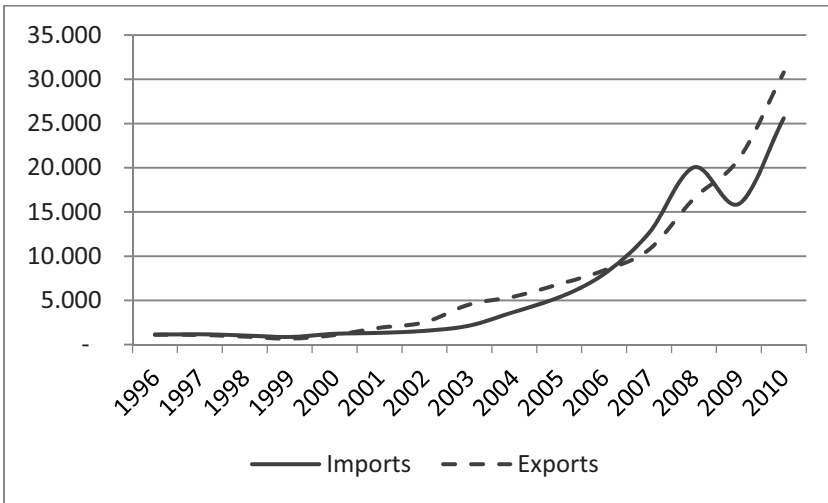
## Direct Impacts

### Bilateral Trade between Brazil and China

As already noted, trade between Brazil and China has expanded significantly in recent years. Figure 1 shows that Brazilian exports to China grew rapidly from 1999 on, following a slight decline in the 1990s. China's share of all Brazilian exports increased dramatically from approximately 2 per cent in the late 1990s to over 15 per cent in 2010, making it Brazil's most important export market (Aliceweb/MDIC). One explanation of this rapid growth of exports is that resource constraints really began to be felt in China at the end of the 1990s. This view is supported by the sharp increase since the late 1990s in China's net trade deficit in a number of primary commodities that Brazil exports, such as iron ore and soybeans (UNCTAD 2005: Fig. 2.8). Furthermore, the accession of China to the World Trade Organization (WTO) in 2001 and the ensuing trade liberalization could have given an additional boost to exports.

The spectacular growth of imports from China started somewhat later than that of exports (see Figure 1), but since 2002 the former have grown sixteen-fold, China's share of Brazilian imports having increased from approximately 2 per cent at the start of the millennium to over 14 per cent in 2010 (Aliceweb/MDIC). China's access to the Brazilian market was improved after the former's 2001 accession to the WTO.

Figure 1: Brazilian Trade with China, 1996–2010 (in million USD)



Source: Aliceweb/MDIC.

### The Structure of Brazilian Exports to China

Although Brazilian exports have grown rapidly, concerns have been expressed over both the composition of these exports – the so-called primarization of Brazilian exports – and their concentration in a relatively small number of products and exporters. In terms of structure, exports to China are predominantly of primary products and resource-based manufactures with relatively limited value added. Table 2 shows that in 1996 and 2001 these accounted for approximately 70 per cent of exports and that there was a shift in the composition of exports to China from resource-based manufactures to unprocessed primary commodities. Since the period of rapid export growth began in 2001, both primary commodities and resource-based manufactures have increased their shares: By 2006 over 80 per cent of total exports fell into these two categories, and by 2009 this had increased to almost 90 per cent.

Table 2 also shows that the composition of Brazil’s exports to China is very different from that of its exports to the rest of the world. In 2009 primary commodities and resource-based manufactures accounted for just over 60 per cent of Brazilian exports to countries other than China, compared to almost 90 per cent to China. Conversely, the share of non–

resource-based manufactures is much higher in Brazil’s exports to the rest of the world.

Table 2: Composition of Brazilian Exports to China (in %)

	Exports to China				Rest of the World
	1996	2001	2006	2009	2009
Primary commodities	26.2	36.6	42.9	42.8	31.6
Resource-based manufactures	44.5	35.7	39.7	45.3	28.6
Low technology	14.1	8.9	8.1	1.7	7.5
Medium technology	13.8	12.1	7.2	7.8	20.8
High technology	1.5	6.7	1.9	2.4	7.6

Note: Exports classified according to the categories used in Lall 2000.

Source: Author’s own elaboration based on UN COMTRADE data.

Exports to China are concentrated in a very limited number of products, with iron ore and soybeans accounting for two-thirds of the total in 2009. Other major products currently exported include crude petroleum, leather and wood pulp. Exports to China are much more concentrated than exports to Brazil’s other major markets: Whereas 95 per cent of Brazil’s non-agricultural exports to China in 2008 were accounted for by 20 Harmonized System 6-digit products, the corresponding number of products required to make up this proportion of Brazilian exports to the US was over 350, to the European Union over 500, and to Argentina over 600 (WTO 2009).

Why is it that Brazil’s exports to China are concentrated in such a narrow range of products? One possible explanation is that Brazil is a resource-abundant country and that the only products in which it has a comparative advantage vis-à-vis China are a few primary commodities and resource-based manufactures. However, there are a number of such products in which Brazil has a strong comparative advantage in world markets but that it has not been exporting to China on a significant scale.

Machado and Ferraz (2006), in a detailed study of the impact of China’s trade on Brazilian exports, identified 58 products at the 6-digit level of the Harmonized System classification in which Brazil had a comparative advantage in its trade with the rest of the world but which were not exported to China in 2001–02 (nor were they exported by China). They also identified a further 46 products which were exported from



Brazil to China, but which lost market share in China between 1996–97 and 2001–02. The most significant groups of products that were either not exported to China or losing market share were meat products; fruits and nuts; soya cake and oil; and iron and steel. The authors carried out a survey of firms producing these products in order to ascertain the reasons they either were not exporting to China or were losing market share. In the case of meat, the main reason was sanitary barriers, followed by import quotas (Machado and Ferraz 2006: Table 36). For fruits and vegetables, the main problems were related to transport and variable supply (Machado and Ferraz 2006: Table 38). In the vegetable oil sector, soybean cake is not exported to China and soybean oil has lost market share. Firms attributed this increased domestic competition to the import-substituting policies in China. A similar process has occurred in the case of iron and steel (for further details see below).

In 2008 a joint report by the Brazilian government and the private sector identified over 600 products (including both primary products and manufactured goods) that had the potential to be exported to China (Governo Federal 2008). But again, tariff and non-tariff barriers were identified as important problems faced by Brazilian exporters to China.

Since, as shown above, Brazil exports a number of manufactured goods to markets other than China, the question is also raised of why the pattern of exports to China is so skewed toward products with a very low level of processing. This is at least in part due to the protectionist policies implemented by the Chinese government to promote its domestic production. This is well illustrated by several of the major value chains in which Brazil has significant exports to China.

Take the case of the soybean value chain: Brazil's exports are heavily concentrated in unprocessed beans, which accounted for over 94 per cent of total exports in 2009. In contrast, there are virtually no exports of soybean meal and flour to China, and a relatively small proportion of the chain's exports is made up of soybean oil (UN COMTRADE). China pursued a deliberate strategy to promote the Chinese crushing industry. For five years after its accession to the WTO, China applied a system of tariff quotas to imports of soybean oil. Imports within the quota paid a tariff of 9 per cent, but extra quota imports were taxed at a much higher rate. Although the differential was reduced over time and the quota ended in 2006, the tariff on oil imports of 9 per cent was three times that on imports of soybean (3 per cent). More processed imported soybean products also pay a higher value-added tax rate than unprocessed beans

(for more details on the protection of the Chinese soybean oil industry, see Lopez, Ramos, and Starobinsky 2010). As a result, while Brazilian exports of unprocessed soybeans increased by seven and a half times between 2002 and 2009, soya oil exports stagnated between 2002 and 2006 and increased only three-fold over the entire period. Brazilian shipments of soybeans to China have also faced problems at times, having been blocked by the Chinese authorities on several occasions for alleged phytosanitary violations (Jales et al. 2004).

The pattern of escalating tariffs, with higher rates levied on more processed products, is also characteristic of other value chains that export from Brazil to China (WTO data on applied MFN tariffs for China in 2005). In the case of leather, for example, the tariff on bovine leather averages approximately 6 per cent, whereas leather products such as suitcases, handbags and wallets are subject to tariffs of between 10 and 20 per cent. Similarly in iron and steel, whereas iron ore and concentrates are imported duty-free, semi-finished products pay a duty of 2 per cent, flat rolled products 5 or 6 per cent, steel wire 8 per cent, nails and screws 10 per cent and steel cans 17.5 per cent. In the case of pulp and paper, another major value chain exporting from Brazil to China, wood pulp is imported duty-free, whereas paper and paperboard are subject to tariffs of between 5 and 7.5 per cent. In all these value chains, Brazilian exports to China are concentrated in the products with the lowest degree of processing. For example, over 85 per cent of exports of iron and steel are of iron ore and concentrates, while in leather over 99 per cent of exports are of leather and less than 1 per cent of leather products (author's own estimation from UN COMTRADE data for 2009).

## Brazilian Imports from China

Not surprisingly, Brazilian imports from China show a completely different structure than its exports to China. Table 3 shows that primary commodities have generally accounted for less than 5 per cent of total imports, and that in 2009, primary commodities and resource-based manufactures – which make up the bulk of Brazil's exports to China – accounted together for just over 12 per cent of its imports from that country.

While non-resource-based manufactures have accounted for the bulk of imports from China throughout the period, there have been significant changes in the technology level of such imports. The share of low technology products fell from almost 40 per cent of imports from

China in 1996 to just over 20 per cent in 2009, while the share of high technology products increased from 25 per cent to over 40 per cent over the same period. This suggests that the range of products in which China competes in the Brazilian market is increasing over time and is not confined to those traditional labour-intensive products sometimes thought to be its area of comparative advantage. While in some cases it may be the less technologically sophisticated processes involved in manufacturing high tech products that are located in China, there is nevertheless considerable evidence that Chinese production is moving up the technological ladder.

Table 3: Composition of Brazilian Imports from China (in %)

	1996	2001	2006	2009
Primary commodities	3.4	4.3	1.4	1.6
Resource-based manufactures	10.9	17.0	9.5	10.7
Low technology	39.6	20.6	16.1	20.8
Medium technology	20.2	19.2	26.2	25.2
High technology	25.0	38.4	46.5	41.4

Note: Exports classified according to the categories used in Lall 2000.

Source: Author’s own elaboration based on UN COMTRADE data.

Another way to look at the composition of Brazilian imports from China is in terms of end use – that is, whether they are intermediate goods, capital goods or final consumer goods. The popular perception of Chinese products is often of cheap consumer goods, but Table 4 shows that this is not in fact the case.

In 2006 and 2009, over half of Brazil’s imports from China were classified as capital goods and their parts and accessories, and approximately one quarter of the imports were classified as industrial supplies. Consumer goods made up only some 15 to 17 per cent of total imports. This is a very marked change from the situation in the mid-1990s when consumer goods accounted for over 40 per cent of total imports from China, and capital goods and parts for less than one quarter of the total. This trend is consistent with the increased technological level of Chinese exports and suggests that – rather than being a competitive threat in the market for final consumer goods – imports from China may be a source of increased profits for Brazilian producers through providing access to

cheaper equipment, intermediate inputs, and parts and components. This question needs to be researched further.

Table 4: Brazilian Imports from China by End Use (in %)

	1996	2001	2006	2009
Food & beverages	3.3	0.9	0.7	1.0
Industrial supplies	22.3	26.2	23.6	26.5
Fuels & lubricants	3.6	9.2	1.7	0.6
Capital goods	12.3	18.1	26.2	24.9
Parts for capital goods	11.9	23.4	28.3	25.3
Transport equipment	0.3	0.0	0.1	0.8
Parts for transport equipment	2.6	2.2	4.6	4.4
Consumption goods	43.6	19.8	14.8	16.5

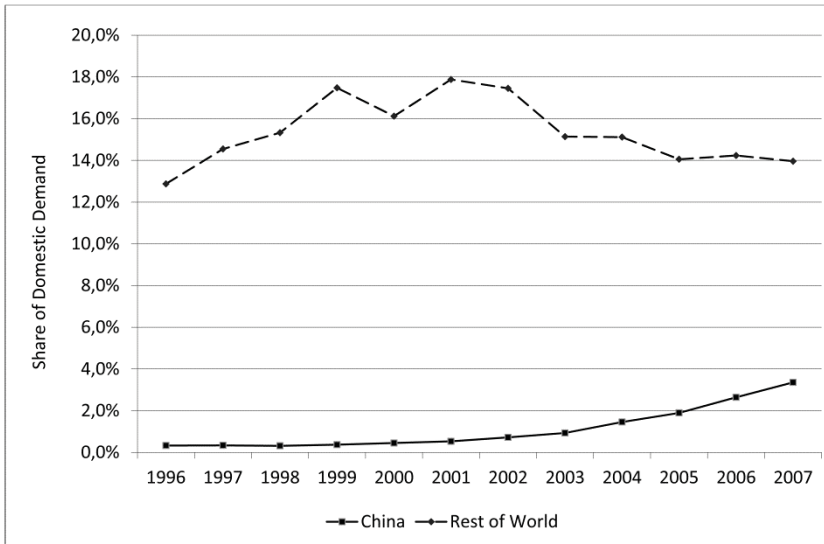
Source: Author's own elaboration from UN COMTRADE data.

One of the main concerns over Chinese exports to Brazil is the extent to which they are displacing domestic producers of industrial goods. Figure 2 shows that the overall level of import penetration of the Brazilian market for manufactured goods increased in the late 1990s as a result of trade liberalization and an overvalued exchange rate. During this period, imports from China remained relatively low. However since 2001, the share of Chinese imports has increased while import penetration from the rest of the world has declined somewhat. This has led to increasingly vociferous complaints from industrialists about competition from Chinese imports (Marin 2005).

Although the aggregate level of Chinese import penetration was relatively low (at only 3.3 per cent of total consumption of industrial products in Brazil in 2007), some industries have been affected much more than others. Imports from China accounted for over 15 per cent of total consumption of medical instruments, travel goods, batteries and accumulators, and lamps and lighting. The level of penetration was over 10 per cent in a number of other sectors including data-processing equipment, radios, TVs and recording equipment, telephone equipment, and basic electronic materials (Jenkins and Barbosa 2011: Table 2). These figures may well underestimate the extent of Chinese competition since they only go up to 2007, and imports have increased further since then. They also take into account only those Chinese goods that are legally

imported. The Brazilian textile and clothing industry association, however, has estimated that it lost 60 million USD in sales to smuggled Chinese goods in 2006 (Paraguassu 2007).

Figure 2: Import Penetration\* in Manufacturing Goods from World and China, 1996–2007



Note: \* Imports divided by gross value of industrial production + imports – exports.

Source: Author’s own elaboration from MDIC/Aliceweb and Pesquisa Industrial Annual data.

## Bilateral Foreign Direct Investment Flows

### *Chinese Investment in Brazil*

Before 2010, Chinese FDI in Brazil was very limited. Although outward investment from China increased rapidly in the late 2000s to become the fifth-largest source of FDI in the world in 2009, Brazil remained largely unaffected. However in 2010 the situation changed with significant new Chinese investment in the country.

Table 5 shows the relatively insignificant level of Chinese FDI flows to Brazil (although it began to grow in 2009). Chinese official data on investment in Brazil differ slightly from those reported by the Brazilian

Central Bank on inflows of Chinese FDI. Nevertheless, they show that a little over 0.1 per cent of Chinese FDI over the period 2003–09 went to Brazil; looking at it from the Brazilian side, less than 0.1 per cent of total inflows of FDI came from China.

Table 5: Chinese FDI Flows to Brazil, 2002–2010

	Outward FDI from China (1)		Inward FDI to Brazil (2)	
	To Brazil (in million USD)	% of Total Chinese FDI	From China (in million USD)	% of Total FDI to Brazil
2002	Not available	Not available	9.7	0.05
2003	6.7	0.23	15.5	0.12
2004	6.4	0.12	4.4	0.02
2005	15.1	0.12	7.6	0.04
2006	10.1	0.06	6.7	0.03
2007	51.1	0.19	24.3	0.07
2008	22.4	0.04	38.4	0.09
2009	116.3	0.21	82	0.27
2010	Not available	Not available	392	0.75
2002–2009*	228.1	0.13	188.6	0.09

Note: 2003–2009 for outward FDI from China.

Sources: (1) MOFCOM 2009: Table 1; (2) IPEA 2011: Table 1.

Some caution is required, however, since there is a tendency to underestimate Chinese FDI, particularly because so much of it goes via third countries – especially Hong Kong and tax havens such as the Cayman Islands and the British Virgin Islands – and therefore does not show up as investment in Brazil in the Chinese data or as investment from China on the Brazilian side. Also, since MOFCOM data is based on trusting that firms will 1) register overseas investments and 2) report reinvested earnings overseas, there is further underestimation (Rosen and Hanemann 2009).

Nevertheless, other sources also indicate limited investment from China in the period up to 2009. The much-quoted joint venture between Vale and Baosteel never got off the ground, and other investments by Chinese firms in this period were on a relatively small scale (Saslavsky and Rozemberg 2009: 212–220).

Although Table 5 shows a sharp increase in Chinese FDI in 2010, other sources indicate that the figure of almost 400 million USD is a fraction of the real investment from China in that year. The Brazilian government think tank IPEA estimates Chinese acquisitions in Brazil in 2010 of over 14.9 billion USD of which over 10.6 billion had been completed and the remainder were awaiting government approval (IPEA 2011: Table 2). The Economic Commission for Latin America and the Caribbean reports confirmed Chinese FDI in Brazil of over 9.5 billion USD in 2010 (CEPAL 2011: Table III.3), while the Brazil–China Business Council puts the figure at nearly 12.7 billion USD, of which over 11.1 billion were acquisitions from other foreign investors (CEBC 2011: 13). The acquisition of a 40 per cent share of Repsol YPF by Sinopec alone represented an investment of over 7.1 billion USD, dwarfing the official figure for Chinese FDI in Brazil. Reports of planned investment by Chinese firms in Brazil in 2011 suggest that they will again come to more than 10 billion USD.

Most of the recent surge in Chinese investment in Brazil has been through mergers and acquisitions. Of the total confirmed investment recorded by CEBC in 2010, only 6 per cent were greenfield investments, and the rest involved M&A (own calculation from CEBC 2011: Appendix 2). As already noted, many of these involved acquisitions from other foreign investors and therefore did not contribute to an increase in capital inflows to Brazil but simply meant a change in the origin of the foreign owners.

The main sectors for Chinese investment in Brazil have been mining and oil and gas, with some planned investments in agribusiness. These are all clearly resource-seeking and reflect the trading relations between the two countries, particularly the concentration of Brazilian exports on primary commodities. There have been some market-seeking investments, most notably the acquisition of several electricity companies by State Grid. There are also Chinese investments in manufacturing to serve the domestic market, including in air conditioners, motorcycles and construction machinery (CEPAL 2011: 177-179), and a proposed investment to produce sub-compact cars by Chery (CEBC 2011: Ch. 4). These are mainly assembly operations that rely on imported parts and components from China and can therefore be seen as an extension of China's export strategy to Brazil.

### *Brazilian Investment in China*

Although Brazilian FDI in China has been relatively limited, as shown in Table 6, the official figures show that until quite recently, Brazilian FDI flows to China exceeded those coming from China (cf. Table 5). Nevertheless, Brazil accounted for less than 0.1 per cent of total FDI inflows to China, and a similarly low proportion of Brazil’s total FDI went to China over the same period.

Table 6: Brazilian FDI in China, 2002–2009

	Inward FDI to China (1)		Outward FDI from Brazil (2)	
	From Brazil (in million USD)	% of Total FDI to China	To China (in million USD)	% of Total Brazilian FDI
2002	15.36	0.03	13	0.03
2003	16.71	0.03	15	0.03
2004	30.7	0.05	28	0.05
2005	24.61	0.04	76	0.12
2006	55.6	0.09	93	0.10
2007	31.64	0.04	83	0.07
2008	38.79	0.04	48	0.04
2009	52.48	0.06	138	0.10
2002–2009	265.89	0.07	494	0.07

Source: (1) *China Statistical Yearbook*, various issues; (2) Banco Central do Brasil.

Despite the rapidly growing trade between Brazil and China, this has not been reflected in significant increases in Brazilian investment in China. There are a few high-profile cases of Brazilian firms that have established plants in China, most notably the aircraft manufacturer Embraer (see Goldstein and Toulan 2007 and Pimentel 2009 for a history of Embraer’s investment in China). Other Brazilian investors include WEG (electric motors) and Embraco (compressors). A number of other large Brazilian firms have been interested in investing in China but have faced obstacles in doing so as a result of Chinese restrictions and requirements (IPEA 2011: 11-12). The main motivation of Brazilian firms investing in China has been to gain access to the large and growing domestic market rather than to produce for export as many Northern transnational companies have done (Pimentel 2009).



Even with the major expansion of Chinese investment in Brazil in 2010, trade continues to be far more important than FDI in economic relations between the two countries. Bilateral trade flows were four or five times greater than FDI flows in 2010, and FDI was mainly driven by trade, with investments forming part of a strategy of ensuring supplies of raw materials from Brazil or securing better access to the Brazilian market for Chinese exports of manufactures.

## Indirect Impacts

Unlike earlier East Asian industrializers such as South Korea and Taiwan, which were relatively small economies, China's size means that its rapid growth is having a major impact on the global economy, which in turn affects other developing countries. In the case of Brazil, two such indirect effects are particularly significant: first, their impact on Brazilian manufactured exports that compete with China in third markets, and second, the effects of increased Chinese demand on world prices of primary commodities that Brazil exports.

## Chinese Competition and Brazilian Exports

Brazil is often presented as a country that has benefitted from the growth of China in contrast to some other countries – most notably Mexico – that have suffered because they compete with China in third markets and have lost market share as a result of China's global expansion. Although Brazil's exports to China are overwhelmingly of natural resource-based products, as was shown in Table 2, more than one-third of its exports to the rest of the world are made up of non-resource-based manufactures, and as such could face increased competition. This section will therefore consider the extent to which Brazil has lost market share to China in its major export markets.

The methodology used to estimate the loss of market share to China is an extension of Constant Market Share (CMS) analysis developed by Batista (2008). The gains (losses) of market shares between countries are related to their relative growth rates. In other words, countries gain from those countries whose exports are growing more slowly and lose to those that are growing faster than their own.

The loss of market share by a country (H) to China (C), in a particular product *i* is defined as:

$$\Delta k_{Hi} = \Delta k_{Hi} * k_{Ci}^t - \Delta k_{Ci} * k_{Hi}^t \quad (1)$$

where:  $k_{Hi}$  is the share of country H in total imports of good i by the destination market;

$k_{Ci}$  is the share of China in total imports of good i by the destination market;

superscript t represents the initial year of the period.

Summing over all products gives the aggregate loss of market share to China:

$$\Sigma \Delta k_{Hi} = \Sigma \Delta k_{Hi} * k_{Ci}^t - \Sigma \Delta k_{Ci} * k_{Hi}^t \quad (2)$$

Although this provides a useful way of attributing losses of market share between countries, it should be noted that the decomposition is based on accounting identities, and one should therefore be careful in making any causal inferences from it.

Equation (2) was used to estimate the loss of market share by Brazil to China. The data was collected for four key years, 1996, 2001, 2004 and 2009, in order to distinguish three time periods. The period from 1996 to 2001 represents the situation before China became a member of the WTO. The period from 2001 to 2004 covers the transition period between China's accession to the WTO and the final removal of quotas on textiles and garments on 1 January 2005, although it should be noted that subsequently the US and the EU imposed new restrictions on Chinese textile and clothing imports. The period from 2004 to 2009 shows the effects of full integration of China into the global economy.

The analysis presented here focuses on the US and the EU since these have been the most significant Northern markets in which Brazil faces competition from China. Evidence is also now emerging that Brazilian exports to other Latin American countries are being affected by Chinese competition (Jenkins and Barbosa 2011: 7) but this will not be discussed here. The data on US imports comes from the US International Trade Commission (<http://dataweb.usitc.gov/>), and that on the European Union from the COMEXT database (<http://fd.comext.eurostat.ec.eu.int/xtweb/>). Product data at the 5-digit level of the SITC (Revision 3) was used. It was important to have a high level of disaggregation in order to ensure that the products being compared were close substitutes for each other.

**Table 7: Brazil's Loss of Exports to China in the US and EU Markets, 1996–2009 (%)**

	US		EU	
	Total	Manufacturing	Total	Manufacturing
1996–2001	-0.5	-0.7	0	-2.5
2001–2004	-6.1	-9.6	-0.1	-0.3
2004–2009	-3.1	-5.3	-2.1	-5.9

Source: Author's own elaboration based on USITC and COMEXT data.

The estimates in Table 7 show that the impact of Chinese competition on Brazilian exports to third markets has been significant. Exports to the US have been worse hit by competition from China than have exports to the EU. In the latter case, it is only since 2004 that Brazil has lost market share to China. In the US, on the other hand, Brazil has been losing export markets to China since China joined the WTO in 2001. Not surprisingly, the impact has been felt most strongly in the case of exports of manufactures to both markets, reflecting the fact that China competes mainly in manufactured goods.

## Impacts on the Terms of Trade

A second important indirect effect of China's growth on Brazil is via the terms of trade and particularly the prices of primary commodities. Because China is not a "small economy" in economic terms, its growth affects world prices, so Brazil benefits not only from the growth of its exports to China but also from higher world prices for its exports to the rest of the world. Indeed, Brazil may benefit from higher prices for products it does not currently export to China, but China imports from other countries and that Brazil exports to the rest of the world.

Table 8 shows the 15 major primary commodities exported from Latin America and the estimated impact of the rapid growth of demand from China on world prices in recent years. The first two columns of figures show a range of estimates of the impact of China's rapid economic growth on prices based on different assumptions about the elasticity of the world supply of the various commodities drawn from a number of different sources. This involved calculating the relative rates of growth of demand for each commodity in China and in the rest of the world between 2002 and 2007 and then estimating how much lower

world demand would have been if Chinese demand had grown at the same rate as demand in the rest of the world over the period (for details of the sources used and how the impact of China on world prices was calculated, see Jenkins 2011). The third column shows the value of Brazilian exports of each of the 15 commodities in 2007. The last two columns show the increased value of Brazilian exports of each product as a result of the higher prices estimated to have been caused by the rapid growth of Chinese demand since 2002.

It is generally recognized that the impact of China's growth on commodity prices has been most significant for metals in recent years. The combination of large increases in Chinese net imports and inelastic supply have led to substantial price increases for most metals with the IMF metals price index increasing more than three-fold between 2002 and 2007 (IMF 2011). The main exception has been aluminium, where Chinese supply has kept up with the growth in demand and China remains a net exporter. Oil prices have also skyrocketed in recent years, but this has had more to do with supply conditions than with the growth of demand, and the contribution of China in terms of world oil consumption has not been as significant as in the case of metals. Brazil has benefitted particularly from the large increases in the price of iron ore between 2002 and 2007.

Agricultural commodity prices have not increased nearly as rapidly as metals and oil prices have. China has become a major importer of soybeans, and its demand growth has been an important factor in the increased prices in recent years. The growth of demand for meat as food consumption patterns change with increased incomes has also meant that China has contributed to increased meat prices. However, in another significant agricultural product exported by Brazil, coffee, Chinese consumption levels are relatively low and demand has not grown very rapidly, meaning that China's impact on prices has been negligible. China has had a significant impact on the prices of some forest products exported from Brazil such as sawn wood and chemical pulp for the paper industry.

Table 8 shows that in 2007 Brazil's exports of the 15 commodities came to almost 56 billion USD, accounting for about one-third of Brazil's total exports that year. The higher prices resulting from the exceptional growth of Chinese demand since 2007 are estimated to have increased Brazilian export earnings by between 9 and 14 billion USD. In other words, between 16 and 25 per cent of the total value of exports of

these 15 commodities could be accounted for by the “China effect” on world prices. The most significant factor in terms of higher export earnings was the increased price of iron ore, but other minerals, crude oil, and soybeans and soybean products also contributed.

Table 8: The “China Effect” on Brazilian Exports of Commodities

Commodity	China's Impact on Prices (%)		Brazilian Exports (in million USD)	Gain in export earnings (in million USD)	
	Maximum	Minimum		Maximum	Minimum
Crude oil	27.1	10.8	8,905	1,900	871
Iron ore	153.6	96.0	10,558	6,394	5,171
Copper	122.6	49.1	2,054	1,131	676
Aluminium	72.8	45.5	4,396	1,852	1,375
Zinc	147.6	59.1	164	98	61
Soybean	7.7	5.1	6,709	477	326
Soya oil	16.0	10.7	1,720	237	166
Fishmeal	15.6	10.4	28	4	3
Coffee	0.5	0.2	3,892	19	8
Sugar	15.5	3.1	5,101	684	153
Bananas	3.0	1.5	44	1	1
Beef	6.6	3.3	3,486	215	111
Poultry	1.4	0.7	4,360	60	30
Sawn wood	25.1	8.4	1,567	314	121
Chemical pulp	11.5	3.8	2,945	303	109
Total			55,929	13,691	9,181

Source: Jenkins 2011 and UN COMTRADE data.

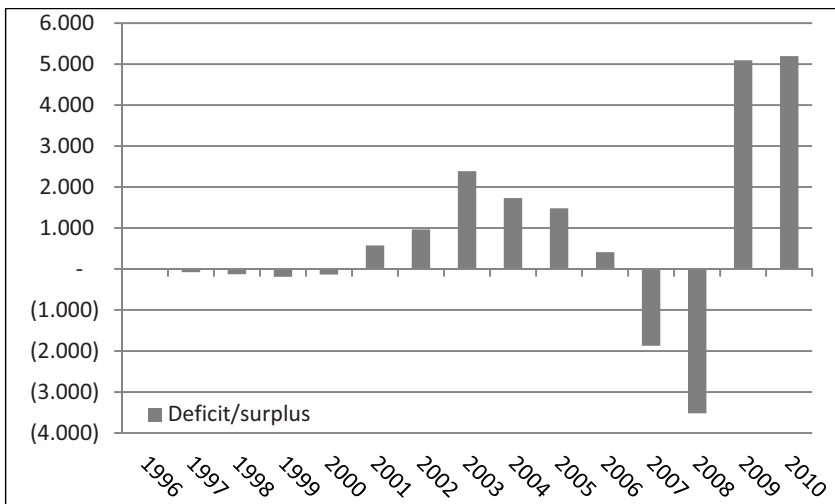
The impact of the “China effect” on Brazil’s trade balance is lower than its impact on export earnings because net exports are less than gross exports, and for crude oil, copper and zinc Brazil was a net importer in 2007. A more accurate estimate of the impact on the trade balance can therefore be obtained by applying the estimated contribution of China to increased prices to the value of net exports rather than of gross exports. On this basis, the contribution of the “China effect” was to improve

Brazil's trade balance by between 6.6 and 9 billion USD or between 11.9 and 16 per cent of the value of exports of the 15 commodities (Jenkins 2011: Table 5).

## The Impact of China on the Growth and Structure of the Brazilian Economy

Since the Brazilian economy has historically suffered from a foreign exchange constraint, a critical factor determining the impact of China on economic growth is its effect on the balance of trade and the balance of payments. Indeed, it was the large trade surpluses that Brazil enjoyed during the first five years of the millennium that were largely responsible for the very positive view of the economic impact of China on the country.

Figure 3: Brazil's Trade Balance with China, 1996–2010 (in million USD)



Source: Aliceweb/MDIC.

As was noted before, Brazil's exports to China grew rapidly from the end of the 1990s on, while the growth of imports from China started only in 2002. The differential timing in the growth of exports and imports is reflected in Figure 3, which illustrates the evolution of the trade balance

between the two countries. Brazil's trade with China showed small deficits until exports began to grow rapidly at the turn of the century. This led to large surpluses, which peaked at almost 2.4 billion USD in 2003. After that, the rapid growth of imports from China led to shrinking surpluses that turned into large deficits in 2007 and 2008. It is not surprising, therefore, that the initial positive view of trade with China was replaced by a more sceptical approach in these years. However, the global economic crisis, which led to a large drop in Brazilian imports from China in 2009 while exports continued to grow, has resulted in large trade surpluses for Brazil the past two years.

However, as the previous section indicated, it is also important to take into account the indirect effects China's growth has had on Brazilian trade. The additional net foreign exchange as a result of the contribution of China to increased world prices since 2002 was estimated at between 6.6 and 9 billion USD in 2007. On the other hand, the loss of markets to China in the United States and the European Union over the longer period from 2001 to 2009 came to approximately 2.5 billion USD (author's own estimation from USITC and COMEXT data). A complete estimate of the loss would be higher since exports to the US and the EU account for only approximately one-third of Brazil's total exports in 2009, and there is evidence that the country is also losing market share to China in its other major markets in Latin America (Jenkins and Barbosa 2011). Approximately half of Brazil's total exports go to markets other than the US, EU and China. If Brazil lost market share to China at the same rate in these other markets as it has in the US and the EU, then the total loss would rise from 2.5 billion to 6.25 billion USD. (Exports to other countries, excluding China, are 1.5 times total exports to the US and EU, so this ratio was applied to the estimated loss of exports to the US and EU.) It may well be that exports to other markets have been less affected than those to the US particularly, so this estimate is likely to be at the upper end of the possible range. Given that it refers to the loss over a longer period (2001–09) than the estimated gain from higher commodity prices (2002–07), and that this high-end estimate is somewhat below the lower bound of the estimated gain from the China effect on commodity prices, the two indirect effects on Brazilian's trade balance are likely to have been positive overall at the end of the first decade of the twenty-first century.

It therefore seems that the effect of China on Brazil's trade balance, taking into account both the direct impacts of bilateral trade flows and

the main indirect impacts, is currently positive. This, however, depends on the continued high level of Chinese demand for commodities that Brazil exports, which is the main factor behind both the direct and indirect positive effects.

Perhaps more significant in terms of the longer-term growth prospects for Brazil is the impact that China is having on the structure of the Brazilian economy. Several studies of the impact of China on Latin America have expressed concerns that the growth of China is contributing to deindustrialization in the region with potentially deleterious effects on technological development and long-term growth (IDB 2006; Moreira 2007; Gallagher and Porzecanski 2010). There is an on-going debate amongst Brazilian economists over whether or not the Brazilian economy is deindustrializing (Bresser-Pereira 2010; Bonelli and Pessoa 2010), and the impact of China is often cited as one cause. Although given the extent of Chinese import penetration it is an exaggeration to claim that it has led to general deindustrialization of the economy, China certainly has contributed to the primarization of Brazil's exports. The pattern of trade with China described in the second section shows clear evidence of this, with exports being overwhelmingly based on natural resources.

This tends to be reinforced by the indirect impacts of China on Brazil. A higher price for primary commodities tends to encourage investment in these areas at the expense of the manufacturing sector. Concerns have been expressed that the commodity price boom may even be having "Dutch disease"-type effects in Latin America (IDB 2006: 212). In addition, as was shown above, Chinese competition in Brazil's export markets is also mainly affecting the manufacturing sector. Given the role often attributed to manufactured exports in promoting economic growth, the difficulties Brazil faces in such markets are another cause for concern.

This also explains the conflicting views of China held by different groups in Brazil. Perhaps more than in any other Latin American country, there are major winners and losers in Brazil as a result of the growth of China, both at the sectoral level and in terms of social classes. Primary commodity producers have been the major beneficiaries, while the major losers have been in the manufacturing sector. The winners consist of a fairly small group of producers who account for the bulk of iron ore and soybean exports. It seems likely that the losing camp, although concentrated in some industrial sectors, consists of far more firms. Further-



more, if the employment effects of losing markets to China are taken into account, the number of losers is likely to be far greater than the number of winners.

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# Contents

## Introduction

- Jörn DOSCH and David S. G. GOODMAN  
China and Latin America: Complementarity, Competition,  
and Globalisation 3

## Research Articles

- **Rhys JENKINS**  
**China and Brazil: Economic Impacts of a Growing  
Relationship** 21
- Roberto HERNÁNDEZ HERNÁNDEZ  
Economic Liberalization and Trade Relations between  
Mexico and China 49
- Ruben GONZALEZ-VICENTE  
The Political Economy of Sino-Peruvian Relations: A New  
Dependency? 97
- Juan Carlos GACHÚZ  
Chile's Economic and Political Relationship with China 133
- Adrian H. HEARN  
China, Global Governance and the Future of Cuba 155

Contributors 181

Article Index 2011 183