BBVA Research

Brazil

Economic Watch

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Economic Analysis

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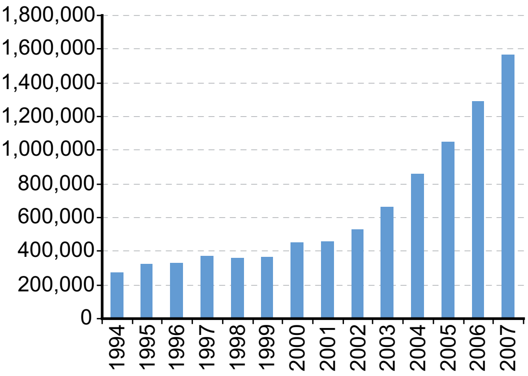
Will the emergence of China deindustrialize Brazil?[1]

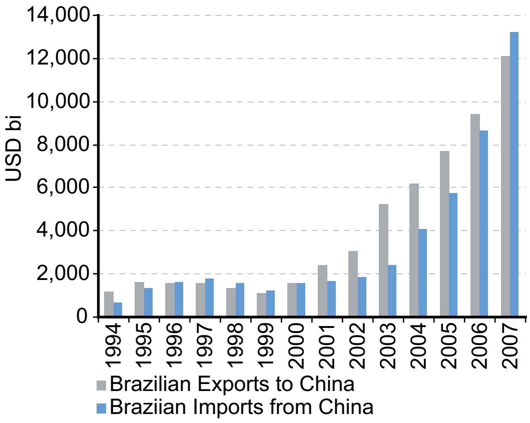
- **The overlapping between Brazilian and Chinese exports is limited** and the degree of competition between the two countries is relatively small.
- **The number of sectors in which Brazil's and China's comparative advantages intersect have declined during the last few years**
  Both countries increased their comparative advantage in the products in which they already had an advantage some years ago and lost their comparative advantage in others.
- **The emergence of China has been causing a displacement of Brazilian exports not only towards natural-based products**
  but also towards goods with higher quality and higher technological content. This challenges the predominant view that the emergence of China will deindustrialize Brazil.

Chart 1
The Emergence of China
Total Chinese Exports (USD millions)



Source: COMTRADE

Chart 2
Brazil and China integration
Commercial Trade (USD millions)



Source: COMTRADE

1: This document is based on the paper "The impact of the emergence of China on Brazilian international trade" by Enestor Dos Santos (BBVA Research) and Soledad Zignago (Bank of France).

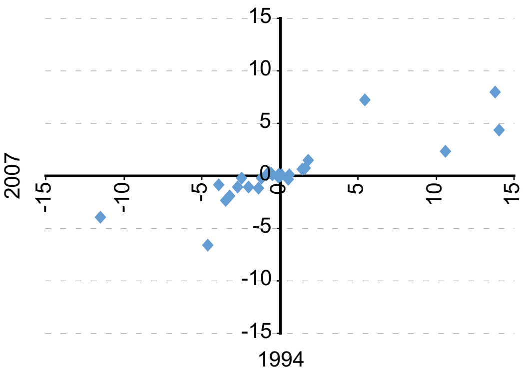
The emergence of China creates good opportunities for commodity producers such as Brazil. There are concerns, however, that increasing commodity exports as well as the direct impact of expansion in Chinese exports of manufactured products imply the deindustrialization of the Brazilian economy.

A first way to approximate the impact the emergence of China can have on Brazil is to check how complementary their trade structures are. The tables presented at the end show that the main sectors in which Brazil displays comparative advantage are commodity-related sectors, more specifically, "food products and beverages", "metal ores" and "agriculture, hunting and related", according to 2007 data. In the case of China, however, the sectors with higher comparative advantage are manufacturing-related sectors.

Comparing how Chinese and Brazilian comparative advantages have evolved between 1994 and 2007 shows that in this period both countries improved upon their initial advantages. On the other hand, there was an increase in the disadvantage in production in sectors that were already less competitive in 1994. This specialization trend was expected, given the relative opening of these economies observed in the period.

Chart 3

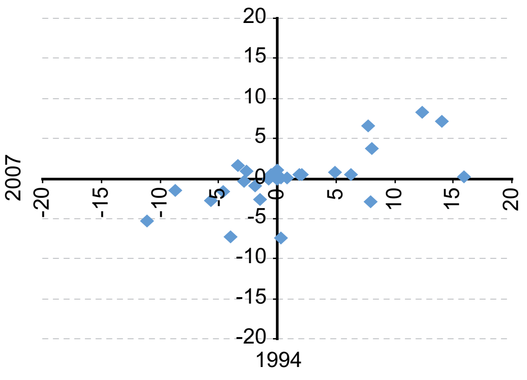
Brazil: Dispersion of Revealed Comparative Advantage: 1994 vs 2007



Source: BBVA Research

Chart 4

China: Dispersion of Revealed Comparative Advantage: 1994 vs 2007

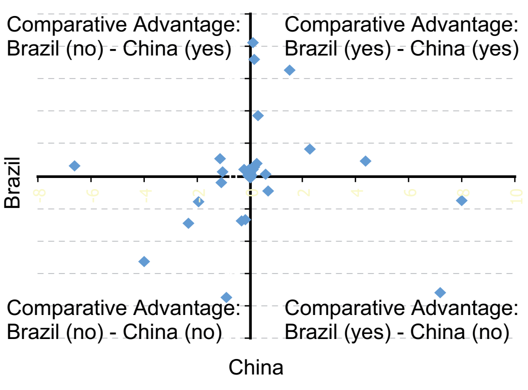


Source: BBVA Research

The number of sectors in which both Brazil and China have comparative advantage has declined since 1994, as shown in the graphs below. In the graph for 2007, it is clear that the number of sectors in the "yes – yes" zone (i.e. the quadrant in which both countries display comparative advantage) is lower than in the 1994 graph. The number of sectors in the "yes – no" zones (i.e. the quadrants where only one country has comparative advantage) is much higher in 2007 than in 1994, suggesting high and increasing complementarity.

Chart 5

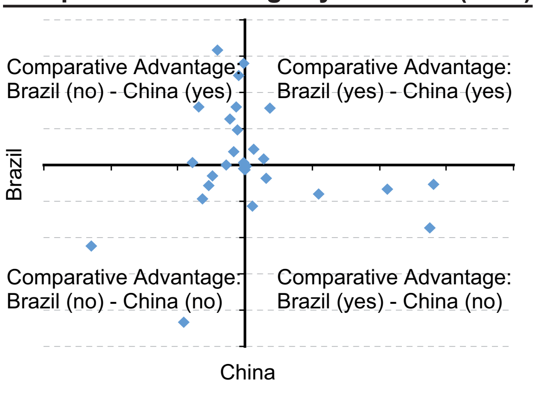
Brazil and China: Dispersion of Revealed Comparative Advantage by Products (1994)



Source: BBVA Research

Chart 6

Brazil and China: Dispersion of Revealed Comparative Advantage by Products (2007)



Source: BBVA Research

The claim that Brazil and China have complementary trade structures is reinforced by the analysis of the comparative advantages based on the technological content of exports. The results displayed in the tables below show that Brazil has advantage in the production of primary products (PP) and of resource-based manufacturing (RB), and to a small extent in low-technology (LT) products. China, on the other hand, has advantage in the production of low-technology (LT) and high-technology (HT) products. In spite of the general complementarity picture that emerges from this analysis, Brazil and China clearly compete in LT markets, in which China has a much greater advantage than Brazil.

Table 1

China: Revealed Comparative Advantage (by Technological Content*)

Technology	2007	1994
LT	47.17	17.09
HT	16.64	-2.98
RB	-7.92	-0.79
MT	-8.42	-16.62
PP	-37.49	0.94

* Services are not presented in the table. The Index of Comparative Advantage of Chinese services was equal to -9.98 in 2007 and to 2.36 in 1997
Source: BBVA Research, BACI.

Table 2

Brazil: Revealed Comparative Advantage (by Technological Content*)

Technology	2007	1994
PP	14.25	1.20
RB	13.64	3.15
LT	5.12	10.17
MT	-12.40	-4.55
HT	-12.84	-6.25

* Services are not presented in the table. The Index of Comparative Advantage of Brazilian services was equal to -7.77 in 2007 and to -3,72 in 1997
Source: BBVA Research, BACI.

Overall complementarity indicators corroborate the evidenced provided by the comparison of both countries' comparative advantages. The Coefficient of Specialization, which varies from 0 to 1 and is equal to 1 when there is no complementarity at all and equal to 0 when there is a perfect complementarity between overall exports, was equal to 0.27 in 2007, confirming that the degree of complementarity between the two countries is high. The Complementarity Index, which compares the export profile of a given country to the import profile of another country, and trends towards 0 when one country does not export the same products imported by the other and is greater than 1 when there exists a complementarity between a country's exports and other country's imports, was, in 2007, equal to 1.14.

Although there is a general complementarity between their trade structures, Brazil and China compete in a set of manufactured products. Both the stimulus that China represents for Brazilian exports of commodities and the competition that the Asian country exerts in manufactured markets raise concerns of an excessive specialization in commodities and a deindustrialization of Brazil's exports. To verify whether this has happened in the last few years, the performance of Brazilian exports in foreign markets from 1994-2007 was analyzed.

The total share of Brazilian exports in global markets increased timidly from 1.11% in 1994 to 1.21% in 2007. The share of Brazilian primary products (PP) exports in world market expanded from 3.26% to 5.24% mainly due to an expansion of the share of Brazilian PP exports to China (which increased from 1.05% to 9.38%). As a share of global markets, Brazilian high-technology exports expanded significantly from 0.21% to 0.48%, although they still remain at very low levels. Regarding other technological groups, medium-technology (MT) and resource-based (RB) shares in world markets remained basically stable while the share of LT exports dropped the most, from 0.99% in 1994 to 0.77% in 2007.

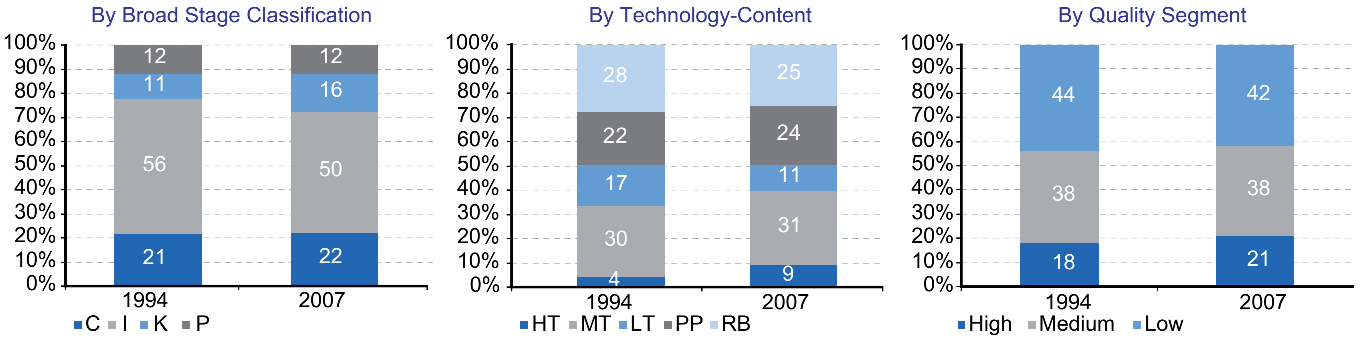
The expansion of HT and the weakening of LT exports are likely related to the fierce competition of Chinese LT products which could have helped to displace Brazilian exports towards more technological groups. Either way, this movement towards more technological exports is good news for Brazil and suggests that the deindustrialization of Brazilian exports is not a necessary consequence of the emergence of China.

In addition to looking at the technological classification (goods with more technological content vs goods with less technological content), one can use new trade datasets to look at the quality dimension of trade flows between Brazil and China. Observe that the quality dimension is independent of the traditional product classification, i.e. any product can be of high or low quality independently of its characteristics or technological content. A non-technological product as soybeans exported by Brazil can be, for example, classified as being of high or low quality depending basically on how its quality compares to the average quality of the soybeans traded in world markets.

Looking, therefore, at the quality dimension of exports, shows that from 1994–-2007 Brazilian exports of high quality (H) products expanded from 18% to 21%, while the exports of medium quality (M) goods remained stable at 38%, and the share of low quality (L) goods in Brazilian exports dropped to 42%. The market share of H exports expanded the most among quality groups in the analyzed period. In 1994 the share of Brazilian H exports in foreign markets was equal to 0.69% and in 2007 this figure rose to 0.80%. The share of M exports in foreign markets expanded less in the same period, from 1.21% to 1.28%. On the other hand, L exports lost space in global markets. In 1994 the market share of Brazilian L exports was 1.66% and in 2007 it declined to 1.6%.

Chart 5

Brazilian Exports (share of total exports; in %)



Source: BACI

From 1994 to 2007, therefore, while China emerged as a giant player in international trade markets, Brazil was able to significantly increase its share of products with more technological content and with higher quality in global markets. On the other hand, low technological and low quality goods lost space in global markets. It is worth noting that this movement towards more technology and quality took place especially in the main markets for Brazilian exports, namely in Europe, Latin America and the USA. This weakens the view that the emergence of China would imply a deindustrialization of Brazil.

Table 3

Brazil: Revealed Comparative Advantage (From ISIC Classification)

Product	ISIC	2007	1994
Food products and beverages	15	**14.07**	**4.36**
Metal ores	13	**13.76**	**7.98**
Agriculture, hunting & related	1	**10.60**	**2.29**
Basic metals products	27	**5.43**	**7.18**
Leather products	19	**1.84**	**1.49**
Paper and paper products	21	**1.61**	**0.70**
Wood & pr. exc. furnit.; straw	20	**1.42**	**0.61**
Other non-metallic mineral pr.	26	**0.61**	**0.16**
Motor vehicles and trailers	34	**0.57**	-0.33
Tobacco products	16	**0.06**	**0.06**
Electricity, gas and steam	40	**0.01**	-0.01
Other service activities	93	**0.00**	**0.00**
Uranium and thorium ores	12	**0.00**	**0.00**
Other business activities	74	**0.00**	**0.00**
Recycling	37	-0.02	-0.01
Forestry, logging & rel. act.	2	-0.02	**0.02**
Leisure, cultural & sport pr.	92	-0.03	**0.00**
Fish, prod. of fish hatcheries	5	-0.04	**0.01**
Other mining and quarrying pr.	14	-0.06	**0.06**
Publishing, printing & reprod.	22	-0.12	-0.06
Furniture; manufacturing n.e.c	36	-0.13	**0.15**
Wearing apparel; fur	18	-0.48	**0.09**
Fabr. metal pr. exc. machin.	28	-0.54	**0.26**

Continued on next page

Table 3 (cont.)

Brazil: Revealed Comparative Advantage (From ISIC Classification)

Product	ISIC	2007	1994
Textiles	17	-0.65	**0.30**
Rubber and plastics products	25	-0.88	**0.11**
Electr. machinery & apparatus	31	-1.15	-0.22
Coal, lignite and peat	10	-1.40	-1.13
Office and computing machinery	30	-2.04	-1.05
Other transport equipment	35	-2.45	-0.17
Medical & precision instr.	33	-2.73	-1.08
Coke, refined petr. pr., nucl.	23	-3.20	-1.92
Radio, TV and communication	32	-3.45	-2.31
Machinery and equipment n.e.c.	29	-3.94	-0.87
Crude petroleum & natural gas	11	-4.59	-6.59
Chemicals & chemical products	24	-11.49	-3.98
Total	TT	0.00	0.00

Source: CHELEM, BBVA Research

Table 4

China: Revealed Comparative Advantage (From ISIC Classification)

Product	ISIC	2007	1994
Office and computing machinery	30	**15.91**	**0.26**
Furniture; manufacturing n.e.c	36	**13.98**	**7.20**
Wearing apparel; fur	18	**12.32**	**8.26**
Textiles	17	**8.04**	**3.76**
Radio, TV and communication	32	**7.97**	-2.93
Leather products	19	**7.79**	**6.54**
Electr. machinery & apparatus	31	**6.32**	**0.43**
Fabr. metal pr. exc. machin.	28	**4.89**	**0.78**
Other non-metallic mineral pr.	26	**2.10**	**0.54**
Rubber and plastics products	25	**1.91**	**0.44**
Wood & pr. exc. furnit.; straw	20	**0.83**	**0.14**
Machinery and equipment n.e.c.	29	**0.37**	-7.47
Publishing, printing & reprod.	22	**0.35**	**0.04**
Fish, prod. of fish hatcheries	5	**0.02**	**0.20**
Other service activities	93	**0.00**	**0.00**
Leisure, cultural & sport pr.	92	**0.00**	**0.07**
Recycling	37	**0.00**	-0.01
Other business activities	74	-0.01	-0.01
Electricity, gas and steam	40	-0.01	**0.41**
Uranium and thorium ores	12	-0.02	**0.00**
Coal, lignite and peat	10	-0.02	**1.03**
Tobacco products	16	-0.08	**0.02**
Other mining and quarrying pr.	14	-0.52	**0.49**
Forestry, logging & rel. act.	2	-0.74	-0.08
Other transport equipment	35	-1.45	-2.68
Paper and paper products	21	-1.83	-0.91
Food products and beverages	15	-2.66	0.90
Medical & precision instr.	33	-2.78	-0.39
Agriculture, hunting & related	1	-3.40	1.65
Basic metals products	27	-3.93	-7.23
Coke, refined petr. pr., nucl.	23	-4.61	-1.59
Motor vehicles and trailers	34	-5.64	-2.80
Metal ores	13	-8.71	-1.48
Chemicals & chemical products	24	-11.14	-5.26
Crude petroleum & natural gas	11	-21.68	**0.61**
Total	TT	0.00	0.00

Source: CHELEM, BBVA Research

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