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Exports account for half the fall of Brazilian industrial production

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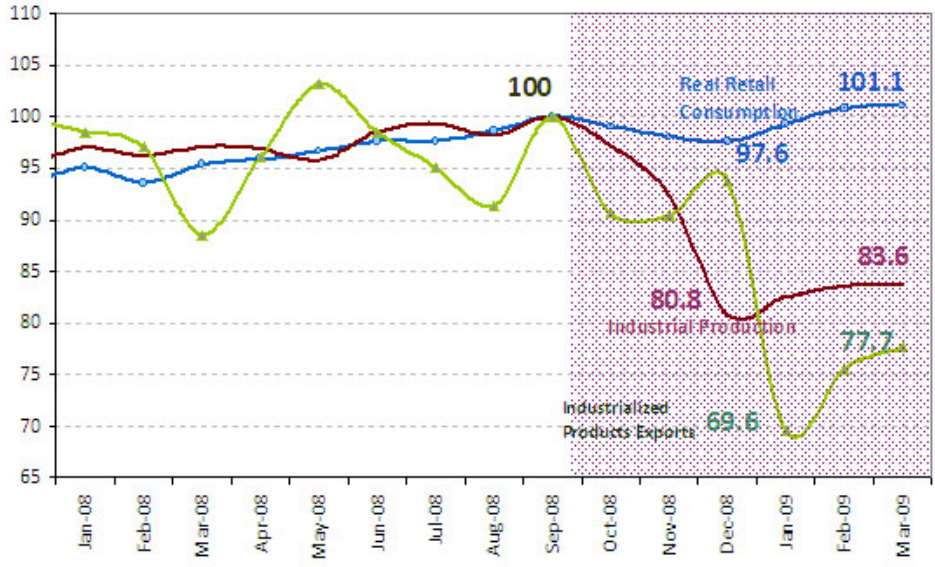
The decline in foreign sales had a negative impact on input production

After more than six months since the international financial crisis worsened, we can say that the fall in global industrial production is related mostly to the decline in world trade.

In Brazil, the fall in industrial production accompanied the global economy, but two surprising characteristics stand out. The first was the intensity of the decrease. Between September 2008 and March 2009, the reduction reached 16%, much worse than the most negative of prospects.[1] The second surprise was the fact that this drop occurred amid a small increase in retail sales, i.e., the level of domestic consumption remained unchanged. Thus, the main reason for the fall in industrial production is most likely exports. This explanation, however, contradicts the low share of exports in the industrial production volume, about 20% in 2008.

1 The data of the study on Brazilian industry are seasonally adjusted. The data on production and retail sales were taken from the IBGE. The data on exports were provided by Secex (Department of Foreign Trade), a body of the Ministry of Development, Industry and Trade, and were seasonally adjusted by the authors.

Chart 1: Industrial Production, Exports and Consumption – seasonally adjusted index (September 2008 = 100)



Source: BNDES, IBGE, Secex and Funcex

In this study, to further investigate this issue, we evaluate the effect of the fall in exports on aggregate industrial production and on each sector over the six months following the worsening of the crisis, between October 2008 and March 2009. The central argument is that, although exports are of a relatively small importance in the industrial production value, there is a significant degree of verticalization in the production of exports - purchase of intermediate goods and capital goods in Brazil by exporting companies - that should be taken into account in the calculation. This verticalization significantly enhances the total effect of the fall in exports on industrial production

Industrial production, exports and final domestic consumption

The IBGE and Secex present monthly data on total production, final retail sales and exports, but not on intersector production and stock formation. Chart 1 shows that between September and December 2008, industrial production declined 19%. This is the worst performance

since the beginning of the series in 1991. Retail sales showed a totally different evolution. Although sales declined over the last quarter of 2008, in March they were already higher than in September last year.

Exports have performed worse than industrial production. In January, external sales showed a decline of 26% compared to September 2008. Some recovery was seen in February and March. Still, exports of industrial goods remain well below the pre-crisis level, with a 22% drop compared to September.

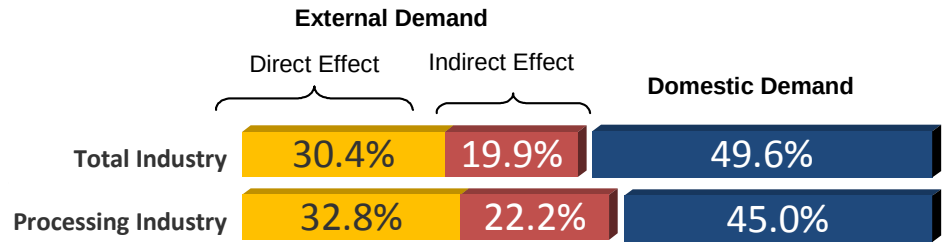
Measurement of exports' effect on industrial production

The total production of an industrial sector has four possible destinations: it can either be exported; used as an input in the production of other goods; be sold in retail; or, when not sold, for stock formation. Thus, to measure the total impact of the fall in exports on a sector's production, we need to add to the direct effect of the decline in external sales its indirect effect, i.e., the decrease in production of intermediate sectors due to the decline in exports.

The estimate of indirect effect was obtained using data from the input-output matrix produced by IBGE. This matrix shows the amount of inputs from other sectors that each industrial sector uses in its production. These data refer to the 2005 input-product matrix, the latest available.

The result for the period from September 2008 to March 2009 is shown in Chart 2. The direct effect of the decrease in exports in each sector on its production accounts for only 30.4% of the reduction in industrial production in the period. However, when we include the effects on intermediate goods

Chart 2: Effect on industrial production decline - % of Total



Source: BNDES (based on data from the IBGE, Secex and Funcex).

earmarked for production of final goods for foreign markets, the importance of exports reaches more than 50%. Thus, the indirect effect accounted for 19.9 percentage points of the drop in industrial production in the period.

We come to the conclusion that the decline in exports accounted for half the fall in industrial production in the six months following the worsening of the international crisis. In the case of the processing industry, the total effect was even greater, with foreign sales accounting for 55% of production shrinkage.

The internal market (household and government consumption), company investment and stock variation accounted for the remaining 49.6 % of industrial production slump. Since IBGE surveys show that there was an increase in retail sales in the period, which means an increase in consumption, this percentage is due to other demand components (investment) and adjustment of industry stocks.

More than half the decrease in industrial production is due to the fall in exports

In the case of the processing industry, the effect of the fall in exports was even greater: 55% of the decrease in industrial production. There are two main reasons for this: on one hand, the fall in foreign sales was higher than in the extraction industry. On the other hand, the indirect effect was stronger due to the impact of the fall in exports on processing industry sectors that produce basic inputs.

Sectorial impacts

Table 1 shows the performance of exports and industrial production between September 2008 and March 2009, as well as the characteristics of industrial sectors in terms of their export coefficients and the percentage earmarked for intermediary consumption. The relationship between export performance and production, however, varied significantly between sectors, even considering the differences in the effect of foreign sales on the production of each industrial segment (export coefficient). In vehicles, for example, exports fell 50%, accompanied by a 29% shrinkage in production. In machinery and equipment, foreign sales dropped by 41%, with a 37% decline in production.

In basic metallurgy, the fall in foreign sales was lower than the industry average, although industrial production shrinkage was twice as high. In chemicals, there was an increase in exports, but a decline in production. The explanation for such trend is that, for the most part, the two segments are important suppliers of inputs to other industry exporting

Table 1 Performance of Industry and Destination of Production

	Performance per Sector (sep/08-mar/09)		Destination of Production			
	Production Variation	Export Variation	Exports	Industry´s Intemediate Consumption	Domestic Demand*	
Sector with high percentage of sales for intermediate consumption						
Basic Metalwork	-30.6%	-13.9%	25.4%	62.4%	12.2%	
Metal Production	-21.5%	-24.4%	8.3%	60.8%	30.9%	
Extraction of Non-Metal Minerals	5.3%	-15.6%	23.6%	58.7%	17.7%	
Chemicals	-6.0%	2.8%	11.6%	57.4%	31.0%	
Textiles	-10.2%	-28.2%	14.6%	56.0%	29.4%	
Rubber and Plastic	-21.3%	-23.9%	9.3%	50.8%	39.9%	
Electrical Material	-37.5%	-23.0%	17.1%	48.8%	34.1%	
Oil and Fuel	0.1%	-9.3%	19.9%	47.0%	33.1%	
Wood Production	-12.8%	-14.4%	42.7%	45.8%	11.6%	
Pulp and Paper	-4.9%	-12.1%	25.0%	36.7%	38.4%	
Extraction of Metallic Minerals	-13.0%	-27.7%	59.6%	35.5%	4.9%	
Sectores with low percentage of sales for intermediate consumption						
Vehicles	-28.6%	-50.1%	18.8%	25.0%	56.1%	
Leather and Shoes	-16.5%	-31.4%	38.0%	23.9%	38.1%	
Non-Metal Minerals	-13.4%	-26.5%	12.3%	23.7%	64.0%	
Machinery and Equipment	-37.4%	-40.8%	23.7%	21.0%	55.4%	
Other Transport Equipment	-6.1%	-56.9%	63.1%	19.8%	17.1%	
Foodstuffs and Beverages	2.3%	15.1%	23.3%	18.7%	58.0%	
Medical and Optical Instruments	-5.4%	-27.4%	22.6%	16.2%	61.2%	
Electronics & Communications	-38.1%	-35.9%	19.2%	11.5%	69.3%	
Furniture & Others	-12.4%	-23.3%	16.3%	5.5%	78.2%	
Office Equipment and Computers	-19.9%	-33.3%	5.6%	1.3%	93.1%	
Clothing	-12.7%	-1.1%	2.7%	1.2%	96.1%	
Extraction Industry	-1.1%	-13.4%	62.0%			
Processing Industry	-15.8%	-23.6%	17.1%			
Total Industry	-15.0%	-22.3%	19.5%			

* Consuption, Investiment and Stock Adjustment

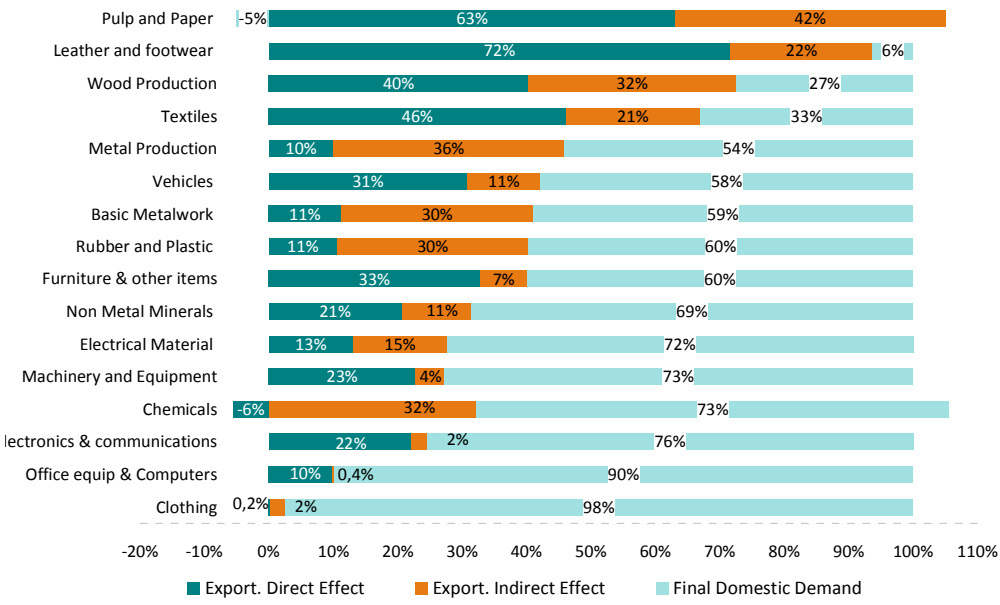
Source: BNDES (based on data from the IBGE, Secex and Funcex).

sectors. Half the production in both segments is earmarked for intermediate industrial consumption.

The clothing sector, in its turn, experienced a drop in industrial production far greater than the drop in its exports. Because this sector has a low export coefficient and a reduced percentage earmarked for intermediate consumption, the main factor that contributed to this drop in production was final domestic demand, as shown by the data indicating a decline in the retail sales of these products – 7% between September 2008 and March 2009.

Chart 3 shows the impact of exports, sorted into direct and indirect effects, on the performance of industrial production per sector. For the purposes of this study, we only presented the industry sectors that showed a fall in production. The sectors "Other Transport Equipment";

Chart 3 Effect of Exports on Industrial Production per Sector - % of Total



Source: BNDES (based on data from the IBGE, Secex and Funcex).

"Extraction of Metallic Minerals"; and "Medical and Optical Instruments" had a total effect greater than 100%. This means that domestic demand contributed positively to industrial production in these sectors.

In general, we see that foreign demand had a strong influence on the drop in industrial production in most sectors. It accounted for more than half the production adjustment in 7 of the 16 sectors analyzed in the Chart. In 13 sectors, foreign demand accounted for more than a quarter of the production shrinkage.

The indirect effect is particularly significant in sectors that produce basic inputs. Included in this group are pulp and paper; basic metallurgy; rubber and plastics; and chemicals. In basic metallurgy, for example, only 11% of the decrease in industrial production was a result of the fall in exports in the sector. The other 30% was a result of the fall in exports in other sectors.

The indirect effect was important to explain the drop in industrial production in sectors that export relatively little, such as rubber and plastics, or the chemical industry. Both have export coefficients of less than 12%. For the rubber and plastic sector, 40% of the decrease in in-

dustrial production can be explained by the reduction in foreign demand. In the chemical industry, which exports only 12% of its production, 32% shrinkage in industrial production was a result of the fall in foreign demand in other sectors.

The importance of the fall in exports in the performance of production was lower in electronics and communications, office equipment and computers, and clothing. In this case, the impact of the internal market on production shrinkage was significant. In fact, the IBGE's monthly survey on retail demonstrates that the worst performance in terms of turnover in retail sales occurred in clothing and footwear, and office equipment, computers and communication.

The return of exports to previous levels will determine the growth of industrial activity

Conclusions

This study seeks to explain why, surprisingly, the fall in exports had a significant role in the shrinkage of Brazil's industrial production. The results show that exports accounted for half the fall in industrial production, in the period, and for more than half (55%) of the reduction in the processing industry.

The impact of exports on production was much higher than expected, considering only the direct effect of the decrease in foreign sales for each sector. We need to take into account the strong impact of the fall in exports on domestic sales of industry inputs earmarked for production by other sectors of exported goods. This effect was particularly strong in the sectors of pulp and paper, basic metallurgy, rubber and plastics, and chemicals.

The results show a Brazilian industry with a reasonable degree of integration between sectors (verticalized), which amplifies the effects of changes in exports on production. However, this strong link indicates that recovery in industrial production tends to be rapid when exports start growing, when economy stocks stop decreasing and when retail sales pick up.

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