

TRADE OPENNESS INDICATORS

ECONOMIC INDICATORS **CNI**



Importance of foreign markets to the manufacturing industry grows significantly

The significance of the foreign market to the manufacturing industry exports, as measured by the **Export Coefficient**, showed growth in 2022. This was after remaining nearly unchanged in 2019 and 2021.

The **Export Coefficient** increased to 20.3% in 2022, marking an increase of nearly two percentage points (p.p.) compared to 2021. This rise in the coefficient signifies a more substantial increase in the volume of exported products compared to domestic production.

Conversely, the expansion in the proportion of imported products in

domestic consumption slowed down. After surging by 2.8 p.p. between 2020 and 2021, the **Import Penetration Ratio** increased by 1.1 p.p. compared to 2021, reaching 25.9% in 2022. As a result, the ratio reached its highest level in the historical series at constant prices.

The **Import Penetration Ratio** was driven by the rebound in demand for consumer goods, particularly in sectors like Wearing Apparel and Accessories, and investments, such as Machinery. This shift was influenced by the resurgence of consumption by Brazilians, despite the devaluation of the real and the delay in the response of the quantity imported to the exchange rate.

In a similar way, the use of imported industrial inputs by the industry has seen a rise. This outcome mirrors the increase in the consumption of imported industrial inputs while seeing a decrease in the consumption of domestic inputs. The **Imports**

Manufacturing Trade Openness Indicators

In %

INDICATORS	CURRENT PRICES		CONSTANT PRICES **	
	2021*	2022*	2021*	2022*
Export Indicator	17.8	18.3	18.6	20.3
Import Penetration Ratio	22.8	23.1	24.8	25.9
Imported Industrial Inputs Indicator	21.8	23.0	24.5	25.1
Net export indicator	8.3	8.0	8.4	9.7

Source: own elaboration.

Note: * estimate. For more details, see methodology at: [CAC](#).

** Constant prices in 2015.

of Industrial Inputs Indicator, measuring the share of inputs imported in the total industrial inputs used by the manufacturing industry, in constant prices, experienced a moderate increase of 0.6 p.p., from 24.5% in 2021 to 25.1% in 2022.

Due to the rise in the export coefficient and the concurrent growth in the

consumption of imported industrial inputs, the **Net Export Coefficient** witnessed a modest decline in 2022 when considering the series at current prices. This reduction continues the declining trend that commenced in 2017.

The indicator, which reflects the disparity between revenue from exports and expenditure on imported industrial inputs, dropped by 0.3 p.p., declining from 8.3% in 2021 to 8.0% in 2022 in the series at current prices.

EXPORT INDICATOR

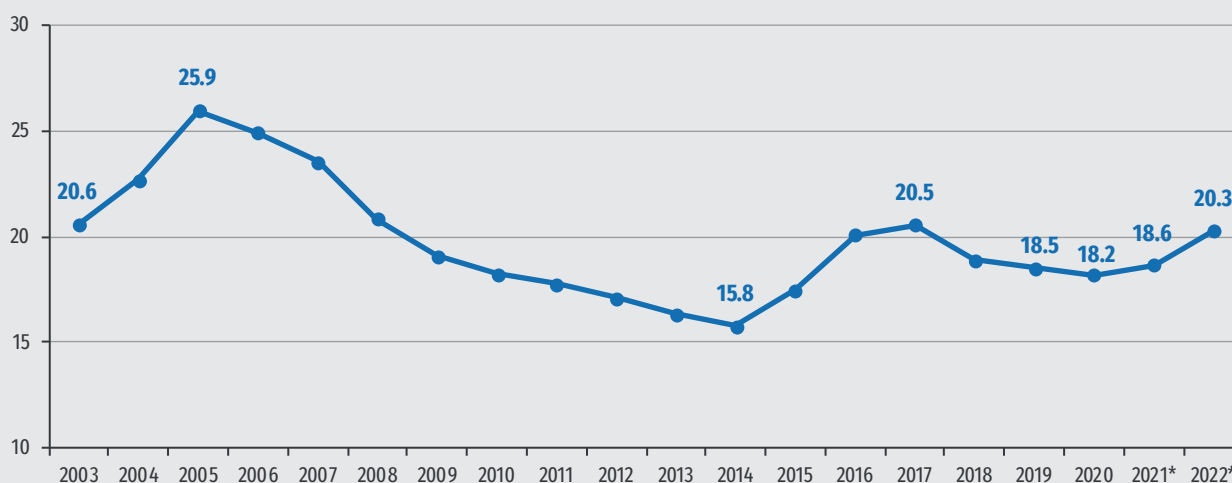
The significance of foreign markets to the manufacturing industry has rebounded after a period of relative decline

Following a period of decline between 2018 and 2020 and maintaining relative stability between 2019 and 2021 (when compared to the pre-pandemic period), the export coefficient saw an increase in 2022. This indicator, measuring the share of production intended to the foreign market, surged by nearly 2 p.p., reaching levels above 20%, up from 18.6% in 2021 to 20.3% in 2022.

A comparison of the manufacturing industry exports to production reveals a significant increase, growing by 8.7% between 2021 and 2022, while production experienced marginal change (-0.2%). This upturn in foreign sales of products from the manufacturing industry can be interpreted as the export of surplus production, given the reduction in domestic production, or as part of an internationalization strategy¹ which also leveraged the devaluation of the national currency.

Manufacturing export indicator

In % - constant prices 2015



Source: own elaboration.

Note: * estimate. For more details, see methodology at: [CAC](#).

¹ Foreign sales to the European Union, Asia (except China), and Latin America (except Mercosur) had a positive influence of 18.7%, 17.4%, and 16.3% respectively between 2021 and 2022. See *Economic Note 26*, CNI. Available at: [<Exportações de bens da indústria de transformação foram recorde em 2022>](#).

The Pulp and Paper sector was among those that experienced a substantial increase in the significance of exports in their production

While the global economic landscape was still in a phase of recovery during this period, the majority of sectors witnessed an uptick in the proportion of exports in their production. Out of the 23 sectors under evaluation, 15 concluded 2022 with an increased export coefficient, 7 saw a decline, and 1 sector remained unchanged in comparison to 2021. However, the increases were significant for 5 out of 15 sectors.

Among the various sectors, the Pulp and Paper industry displayed one of the most remarkable increases in the coefficient. Production for the foreign market in this sector surged by 6.5 p.p., escalating from 37.9% in 2021 to 44.3% in 2022, marking the highest value ever recorded in the series at constant prices.

The foreign market has acted as a catalyst for domestic production in the Pulp and Paper sector, despite an increase in domestic demand. Consequently, the Pulp and Paper sector experienced a substantial expansion in export values, with a remarkable growth of 21.0% between 2021 and 2022.

The Tobacco sector also witnessed substantial growth in the coefficient. The coefficient in this sector increased from 51.0% in 2021 to 61.2% in 2022, marking a significant rise of 10.2 p.p.. Within this sector, the foreign market served as a driver for domestic production, even in the context of rising domestic demand. As a consequence, the Tobacco sector recorded a noteworthy 30.0% increase in the value of exports between 2021 and 2022.

Regarding the other sectors that showed a significant increase in the indicator, the highlights are: Motor Vehicles, Food, and Wood. Exports in the Motor Vehicles sector contributed to an incremental impact on domestic production, albeit to a modest extent. The export coefficient

for this sector registered an increase from 16.7% in 2021 to 19.4% in 2022. The export performance of the Motor Vehicles sector can be attributed to heightened demand in certain Latin American nations, notably Chile and Argentina.

In 2022, the Motor Vehicles sector had specific goods that prominently featured in the coefficient, at constant three-digit prices. Motor Vehicles registered an increase of 21.3%; Vehicle Bodies, Trailers, and Semi-Trailers experienced a 13.1% surge; and Parts and Accessories for Motor Vehicles grew by 17.4%. Furthermore, the value of exports in these categories increased by 24.3%, 37.5%, and 10%, respectively.

In the Food sector, production intended for the international market expanded by 2.7 p.p., climbing from 28.3% in 2021 to 31.0% in 2022, marking the highest coefficient in the series at constant prices. The Food sector's strong export performance is attributed to increased demand in various countries, especially in China.

Next, in the Wood sector, production and sales abroad experienced a decrease in internal and external demand, but the reduction in exports was smaller, showing a retraction in internal demand larger than in external demand in 2021-22. The export indicator in the sector rose from 45.2% to 48.4% in this period.

This sector primarily includes Wood, Cork, Straw, and Basketry Products exported by Brazil, and it observed an increase in the export coefficient of 2.2 p.p. between 2021 and 2022. The three digit constant price coefficient for these goods climbed from 37.3% in 2021 to 39.5% in 2022.

The most significant decreases in the Export Coefficient between 2021 and 2022 were witnessed in the Other Transport Equipment and Furniture sectors, which decreased by 1.3 and 1.2 p.p., respectively. During this period, the Export Coefficients dropped from 38.1% to 36.8% and from 13.2% to 12.0%, respectively.

The Other Transport Equipment sector is very heterogeneous. This sector includes the construction of ships, rail vehicles, aircraft, military combat vehicles, motorcycles, bicycles, tricycles, and carts, among others. In addition, the behavior of the coefficient is volatile.

In the Furniture sector, production and sales abroad experienced a decrease in internal and external demand, showing a retraction in external demand larger than in internal demand in 2021- 2022. Another sector that experienced a moderate reduction in the Export Coefficient was Non-Metallic Minerals.

Export indicator – Sectors with the biggest variations from 2021 and 2022

In % - constant prices 2015

	SECTORS	INDICATORS		VARIATION (pp)
		2021*	2022*	2021-2022
Main increases	Tobacco	51.0	61.2	10.2
	Pulp and Paper	37.9	44.3	6.4
	Wood**	45.2	48.4	3.2
	Wood, Cork, Straw, and Basketry Products	37.3	39.5	2.2
	Motor Vehicles**	16.7	19.4	2.7
	Motor Vehicles	18.0	21.3	3.3
	Bodies for Motor Vehicles; Trailers and Semi-Trailers	8.9	13.1	4.2
	Parts and Accessories for Motor Vehicles	16.1	17.4	1.3
	Food	28.3	31.0	2.7
Main decreases	Other Transport Equipment**	38.1	36.8	-1.3
	Vessel Construction	5.9	5.0	-0.9
	Aircraft, Spacecraft, and Related Machinery	87.8	84.8	-3.0
	Furniture	13.2	12.0	-1.2
	Non-Metallic Minerals	9.7	9.2	-0.5

Source: own elaboration.

Note: * estimate. For more details, see methodology at: [CAC](#).

** ISIC 4.0 groups (three digits) calculated.

IMPORT PENETRATION RATIOS

For the second contribute year, the share of imports in Brazilian consumption reached a record high

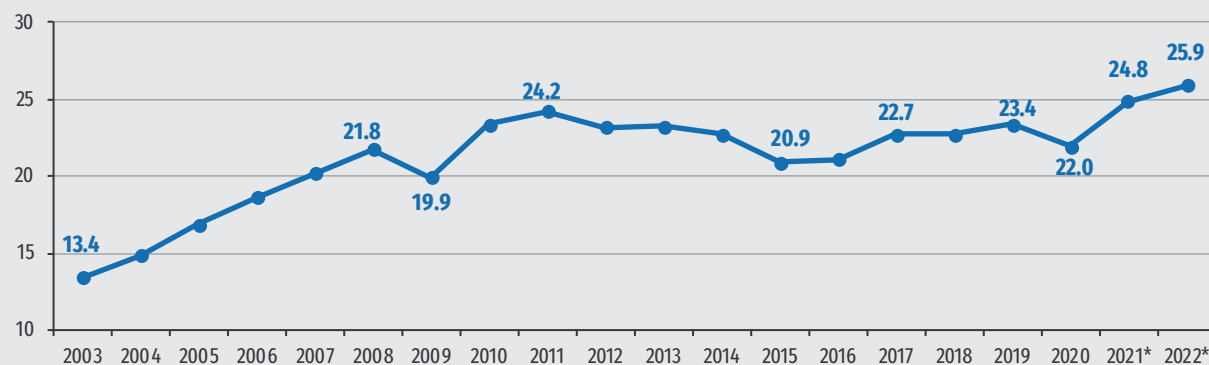
The import penetration ratio measures the share of imported goods in Brazil's apparent consumption. Apparent consumption is all that is produced domestically, minus exports plus imports.

The indicator reached a new record in 2022, surging from 24.8% in 2021 to 25.9% in 2022. This 1.1 p.p. increase in the indicator signifies that imports played a more substantial role in the Brazilian domestic market in 2022 compared to 2021.

One of the primary drivers behind the growth in the import penetration ratio was the rebound in consumer demand following the pandemic. Consumer goods sectors, such as Wearing Apparel and Accessories, and Leather and Footwear, which experienced a drop in demand during the pandemic and a decrease in the coefficient, observed a significant increase in demand post-pandemic as consumers resumed shopping activities that had been constrained.

Manufacturing import penetration ratio

In % - constant prices 2015



Source: own elaboration.

Note: *estimate. For more details, see methodology at: [CAC](#).

The wearing apparel and accessories and machinery sectors witnessed a substantial upswing in imports for Brazilian consumption

During the transition from 2021 to 2022, the import penetration ratio decreased in four sectors, with the most significant declines occurring in Pharmaceuticals (-2.5 p.p.) and Basic Metals (-1.3 p.p.). In both of these sectors, the reduction is due to decreased imports, which amounted to 12% and 15% of the imported value between 2021 and 2022, respectively.

Specifically within the Pharmaceuticals sector, the coefficient declined by 2.5 points in 2022 compared to the previous year. After being significantly impacted by the pandemic in 2021, with a coefficient of 53.1%, the sector recorded a coefficient of 50.6% in 2022.

Within the Basic Metals sector, the coefficient decreased from 20.7% in 2021 to 19.4% in 2022. In this sector, some of the products that experienced reductions in the three-digit indicator between 2021 and 2022 were Iron and Steel, which declined from 15.6% to 14.8%, and Primary Products of Precious and Other Non-Ferrous Metals, which decreased from 32.1% to 27.2%.

Wearing Apparel and Accessories was the sector that presented the highest increase in the import penetration

ratio, up by 4.2 p.p., comparing 2021-2022. In 2022, the sector witnessed substantial growth, driven by the recovery of Brazilian consumer demand for goods that had been previously restrained, reaching a coefficient of 14.6%. Additionally, it recorded a 34% increase in the value imported between 2021 and 2022.

Within this sector, notable goods that experienced an increase in the coefficient between 2021 and 2022, at constant three-digit prices, were Knitwear, which rose from 32.1% to 36.4%, and Wearing Apparel, excluding fur articles, which increased from 9.5% to 13.2%.

The most substantial increases in the coefficient in the 2022 period compared to 2021 were observed in different sectors considered strategically important for investment, such as Machinery, equipment, and electrical materials (+3.8 p.p.), Machinery and equipment (+3.2 p.p.), as well as Leather and footwear (+3.3 p.p.) and Textile products (+3.0 p.p.).

In 2022, in the Machinery, equipment, and electrical materials, as well as the Machinery and equipment sectors, some of the three-digit sectors that stood out in the coefficient were: Electric motors, generators and transformers, and electricity distribution and control apparatus, 42.0%; general-purpose machinery, 61.4%; and special-purpose machinery, 30.8%. These sectors are considered strategic for investment in Brazilian industrial production.

In the Leather and footwear, as well as the Textile products sectors, between 2021 and 2022, the goods that stood out in terms of the three-digit indicator increase were: Tanning and finishing of leather; manufacture of luggage, handbags, and saddlery; dressing and dyeing of leather (+8.0 p.p.); Footwear (+1.2 p.p.); Spinning, weaving, and finishing of textile products (+4.0 p.p.); and Other textile products (+1.9 p.p.).

Import penetration ratio – Sectors with significant variations from 2021-2022

In % - constant prices 2015

	SECTORS	INDICATORS		VARIATION (pp)
		2021*	2022*	2021-2022
Main increases	Wearing Apparel and Accessories**	10.4	14.6	4.2
	Wearing Apparel, except fur items	9.5	13.2	3.7
	Knitwear	32.1	36.4	4.3
	Electrical Machinery, Equipment, and Materials**	36.8	40.6	3.8
	Electric Motors, Generators and Transformers, and Electrical Energy Distribution and Control Devices	41.5	42.0	0.5
	Leather and Footwear**	9.4	12.7	3.3
	Leather Tanning and Finishing; Manufacture of Bags and Saddlery; Leather Dressing and Dyeing	21.3	29.3	8.0
	Footwear	5.5	6.7	1.2
	Machinery and Equipment**	42.0	45.2	3.2
	General-Purpose Machines	56.5	61.4	4.9
	Special-Purpose Machines	28.3	30.8	2.5
	Textiles**	24.9	27.9	3.0
	Spinning, Weaving, and Finishing of Textile Products	22.2	26.2	4.0
	Other Textiles	27.7	29.6	1.9
Main decreases	Pharmaceuticals and Pharmaceuticals	53.1	50.6	-2.5
	Basic Metals**	20.7	19.4	-1.3
	Iron and Steel	15.6	14.8	-0.8
	Primary Products of Precious and Other Non-Ferrous Metals	32.1	27.2	-4.9

Source: own elaboration.

Note: * estimate. For more details, see methodology at: [CAC](#).

** ISIC 4.0 groups (three digits) calculated.



IMPORTED INDUSTRIAL INPUT INDICATOR

The use of imported inputs in Brazilian production reaches a new record high

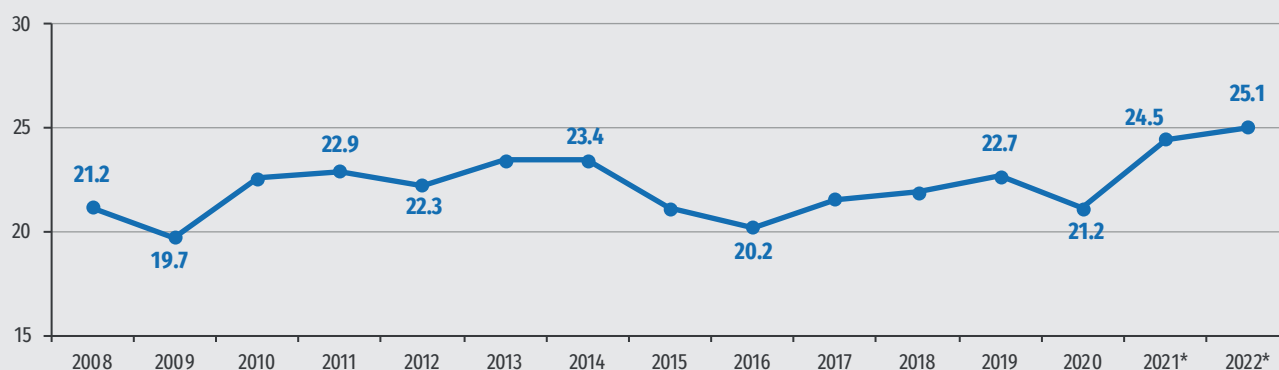
The share of imported industrial inputs in the total inputs used by the manufacturing industry (Imported Industrial Inputs Ratio) reached a new record level in 2022. The use of imported

industrial inputs by Manufacturing increased from 24.5% in 2021 to 25.1% in 2022.

The value of imported industrial inputs consumption in constant prices increased 2.6%, while domestic industrial input consumption decreased 0,6%.

Manufacturing imported inputs indicator

In % - constant prices 2015



Source: own elaboration.

Note: *estimate. For more details, see methodology at: [CAC](#).

Of the 20 sectors considered², three concluded 2022 with a decrease in the Imported Industrial Inputs Ratio, 15 experienced an increase, and two remained unchanged compared to 2021. The reductions were especially notable in two of the three sectors.

The Pharms and pharmaceuticals sector recorded the most significant decline in the coefficient, dropping from 35.9% in 2021 to 34.3% in 2022, a decrease of 1.6 p.p.. In this sector, there was a decline in the total consumption of industrial inputs (-2.0%). However, the consumption of imported inputs decreased (-6.0%), while the consumption of domestic inputs increased (+1.0%).

After the peak of the pandemic, the Pharms and Pharmaceuticals sector, which reached the highest level of the import coefficient during the

pandemic, played a decisive role in the internalization of some domestic inputs in the sector. This justifies the increase in the consumption of domestic raw materials in 2022.

The second-largest drop in the imported input coefficient between 2021 and 2022 was observed in the Basic Metals sector, which decreased by 1.4 p.p. (from 22.5 in 2021 to 21.1% in 2022). In this sector, there was a reduction in the total consumption of industrial inputs (-5.0%), with decreases in the consumption of imported inputs (-11.0%) and in the consumption of domestic inputs (-4.0%).

The most significant increases in the coefficient during this period were recorded in the following sectors: Wearing Apparel and Accessories (2.6 pp); Computers, Electronics, and Opticals (2.4 pp); Textiles (1.8 pp); Machinery and Equipment (1.7 pp); and Other Transport Equipment (1.6 pp).

As mentioned earlier, the recovery in demand from Brazilian consumers for consumer goods after the pandemic led to an upswing in imports of Wearing Apparel and Accessories, as well as Textile products. In the other sectors mentioned, the rise in the consumption of imported industrial inputs surpassed the increase in the consumption of domestic industrial inputs.

² The Food and Tobacco sectors were not included in the calculation due to the significant weight of inputs sourced from agriculture in the production of these sectors. This holds for both imported inputs and net exports coefficients.

Imported industrial input indicator - Sectors with the most significant variations from 2021-2022

In % - constant prices 2015

	SECTORS	INDICATORS		VARIATION (pp)
		2021*	2022*	2019-2021
Main increases	Wearing Apparel and Accessories	22.2	24.8	2.6
	Computers, Electronics, and Opticals	42.0	44.4	2.4
	Textiles	30.5	32.3	1.8
	Machinery and Equipment	27.4	29.1	1.7
	Other Transport Equipment	29.0	30.6	1.6
Main decreases	Pharmaceuticals and Pharmaceuticals	35.9	34.3	-1.6
	Basic Metals	22.5	21.1	-1.4

Source: own elaboration.

Note: * estimate. For more details, see methodology at: [CAC](#).

NET EXPORT INDICATORS

Expenses on imported industrial inputs reduces export revenue, continuing the downward trend

The net export coefficient indicator reflects the balance, in reais, between export revenue and expenditure on imported industrial inputs - both measured concerning the value of production³. The ratio is positive when revenue from exports exceeds expenditure on imported industrial inputs.

From 2021 to 2022, the manufacturing net export indicator registered a slight drop from 8.3% to 8.0%, keeping the downward trend that began in 2017, despite the growth in 2020. The result indicates a lower expansion in the manufacturing industry's exports compared to its imports of industrial inputs.

When the indicator is above zero, it signifies that the industry is more responsive to a strengthening of the domestic currency than to a depreciation. A devaluation of the national currency leads to increased costs for imported goods. It's essential to recognize that this dynamic can vary among industrial sectors.

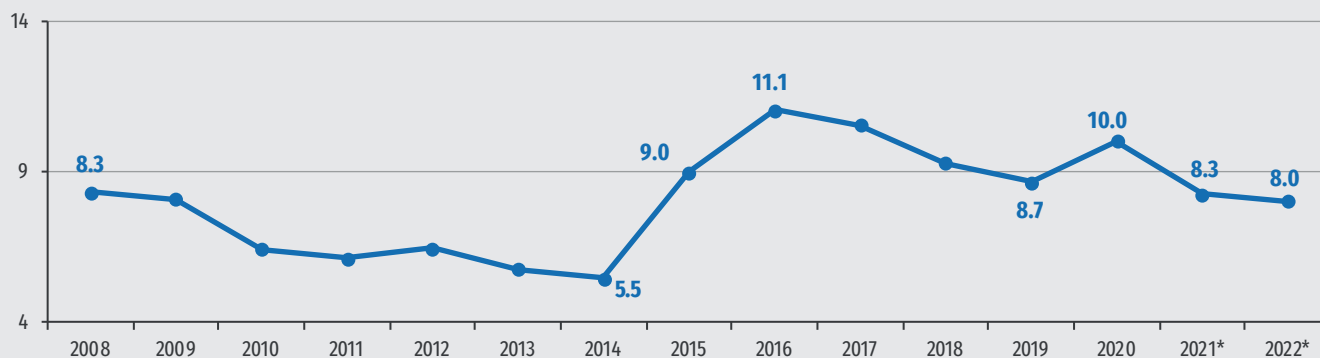
The Motor Vehicles, Pharmaceutical and Pharmaceuticals, Basic Metals, and Machinery and Equipment sectors continued to exhibit the highest net export coefficients. The first sector, Motor Vehicles, further extended its lead from the other sectors by registering a 2.7 pp increase in the coefficient between 2021 and 2022. The other three sectors experienced a marginal rise in revenue and recorded an approximate 1 pp increase in the 2021-2022 period.

The sectors with the lowest indicators in 2022 are: Leather and Footwear, Non-Metallic Minerals, Rubber and Plastics Products, and Textiles.

³ The Net Export ratio differs from other indicators (Export Coefficient, Import Penetration, and Imported Industrial Inputs) because it uses current prices. This method takes into account both income and expenditure, providing a more precise analysis of this indicator.

Manufacturing net export indicator

In % - current prices



Source: own elaboration.

Note: * estimate. For more details, see methodology at: [CAC](#).

Exports indicator – Sectors with the most significant variations from 2021-2022

In % - constant prices

	SECTORS	INDICATORS		VARIATION (pp)
		2021*	2022*	2021-2022
Main increases	Motor Vehicles	3.7	6.4	2.7
	Pharmaceuticals and Pharmaceuticals	-1.2	-0.3	0.9
	Basic Metals	26.0	26.9	0.9
	Machinery and Equipment	10.6	11.3	0.7
Main decreases	Leather and Footwear	22.2	18.1	-4.1
	Non-Metallic Minerals	1.2	-2.3	-3.5
	Rubber and Plastic Products	-7.0	-9.7	-2.7
	Textiles	-6.2	-8.7	-2.5

Source: own elaboration.

Note: * estimate. For more details, see methodology at: [CAC](#).

Note on trade openness coefficients

The export and import penetration coefficients are additionally calculated for selected sectors at the three-digit ISIC level. [Click here to see the new CAC survey data tables.](#)



Learn More

More information on the new methodology and research data charts: www.cni.com.br/e_cac

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Customer Service - Phone: +55 (61) 3317-9992 email: sac@cni.com.br

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