CEPII

# Dominance on World Markets: the China Conundrum

Sébastien Jean, Ariell Reshef,
Gianluca Santoni & Vincent Vicard

## Summary

We characterize China's atypical dominance in world trade at the product level and analyze a number of factors that could explain it.

Defining product-level dominant positions as a share of more than 50% of worldwide exports, we show that China held a dominant position in almost 600 products out of some 5,000 in 2019. This is at least six times greater than the equivalent number for the United States, Japan or any other country, and twice the number for the European Union considered as a whole. This large number of dominant positions held by China is atypical by historical standards, at least since the 1970s.

While we do not identify definite causes of China's numerous dominant positions, we can rule out some explanations. The number of dominant positions is not explained by Chinese global market share alone. Nor is it explained by China's sector specialization; dominant positions are prevalent in several important sectors (electronics, textiles/wearing apparel, footwear and machinery).

Looking at pricing behavior, a fine-grained analysis based on individual firms' average market share suggests that Chinese firms use their market power to charge significant mark-ups, much more than French exporters.

Such product-level dominant positions make it difficult for importers to substitute their supplier for another, at least in the short term. This may be consequential in an open world increasingly seen through the lens of dependencies.

RESEARCH AND EXPERTISE
ON THE WORLD ECONOMY

## ■ Introduction

In 2019, China held a dominant position in the global economy, defined by a share of more than 50% of the worldwide export market, for almost 600 products at the most detailed level of harmonized trade classifications (around 5,000 products). This means that China supplies at least half of global imports for these products. This figure is at least six times greater than the equivalent number for the United States, Japan or any other country; even the European Union considered as a whole does not reach half this level.

This fact is intriguing, and is potentially consequential. Indeed, close economic interdependence, and trade relations in particular, are increasingly considered through the lens of dependence, thus raising questions of vulnerability and leverage. A dominant position, as we define it, is significant because it implies that buyers of a good on international markets will find it difficult to replace their supplier with another. Relying on a 50% threshold to characterize dominance is admittedly somewhat arbitrary, and we will check our results' robustness to using alternative values. However, arithmetically, having a more-than-half share of a market implies that the country is the most important provider, generally by far. Hence, a supplier that enjoys a dominant position has more leverage over its buyers, and puts competitors at a disadvantage. At the same time, a buyer that relies on imports of a product where one of the exporters holds a dominant position is vulnerable to disruptions from a dominant source.

*in 2019, China held a dominant position for almost 600 products*

Recent empirical assessments of trade vulnerabilities reflect this view. For example, the European Commission (2021) defines dependencies as "reliance on a limited number of actors for the supply of goods, services, data, infrastructures, skills and technologies combined with a limited capacity for internal production to substitute imports". Accordingly, building on previous work by Bonneau and Nakaa (2020), the first step in the empirical identification of dependencies relies on an indicator of the concentration of EU imports from extra-EU sources. Jaravel and Méjean (2021) focus on products for which more than half of French imports are sourced from extra-EU countries, and for which imports are strongly concentrated (Herfindahl-Hirschman index of imports by origin larger than 0.5). Zenglein (2020), in assessing the EU's situation with regard to China, defines dependencies as products where the EU is a net importer, with more than 50% of its imports coming from China, and China supplying more than 30% of global exports. Beyond their differences, these assessments of trade vulnerabilities thus all focus on the concentration of imports.

The very large number of products for which China enjoys a dominant position at the world level is far more than a statistical curiosity; it has potentially meaningful consequences from a political economy point of view. This is why this Policy Brief aims at analyzing in depth this pattern: Is it only a matter of sheer size, given that China is the leading world exporter of merchandise? Is it a recent pattern? Is it unusual by historical standards?

## ■ 1. China's dominant positions: more than size can explain

China is the largest exporter of goods worldwide. Therefore, it is natural that it is also the country holding the largest number of product-level dominant positions, defined as a world-level export market share above 50%.[1] Indeed, the number of product-level dominant positions is closely related to a country's aggregate share in world export (Figure 1), and the relationship is even stronger for large exporters (Panel A) than for other countries (Panel B). However, even taking its high market share into account, the number of product-level dominant positions appears particularly high for China. With an export market share slightly larger than the EU's (18% vs. 17%), it holds twice as many dominant positions; the US's market share is much smaller, at 11%, but it has approximately six times fewer dominant positions.

This is even more surprising given China's intermediate income level. According to Imbs and Wacziarg (2003, p. 3), "various measures of sectoral concentration follow a U-shaped pattern across a wide variety of data sources: countries first diversify, in the sense that economic activity is spread more equally across sectors, but there exists, relatively late in the development process, a point at which they start specializing again". This pattern is also manifested in a U-shape pattern in exports shares (Cadot, Carrère & Strauss-Kahn, 2011). China's intermediate level of income would suggest that it should be well diversified in its export products, without exhibiting particularly strong specializations. In contrast, China's relatively large number of dominant positions reflects a concentration of exports on products in which it is dominant.[2]

*for a similar market share in world exports, China invariably holds a substantially larger number of product-level dominant positions*

Figure 1 – The cross–country relationship between dominant positions and market share (in %) in 2019
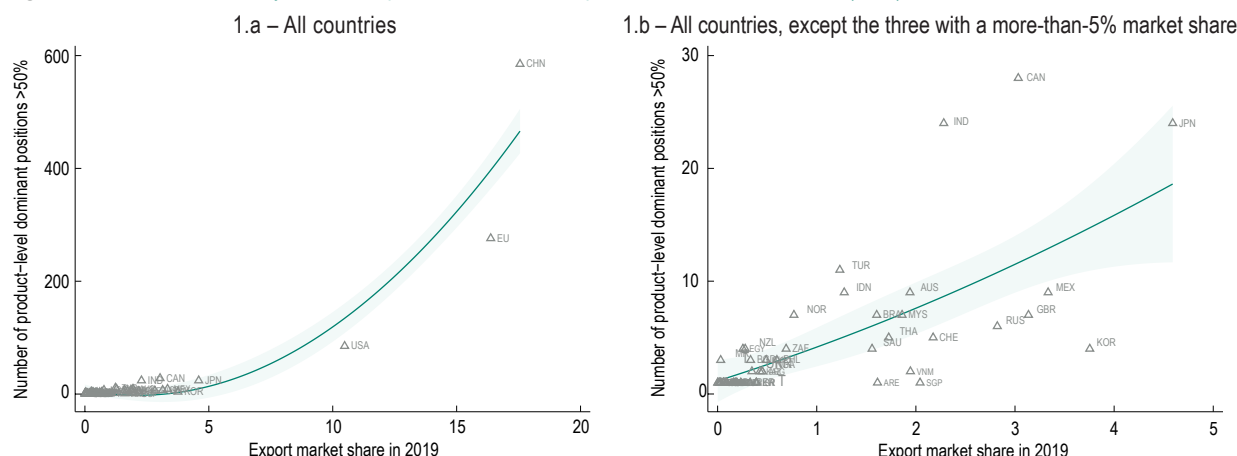
1.a – All countries



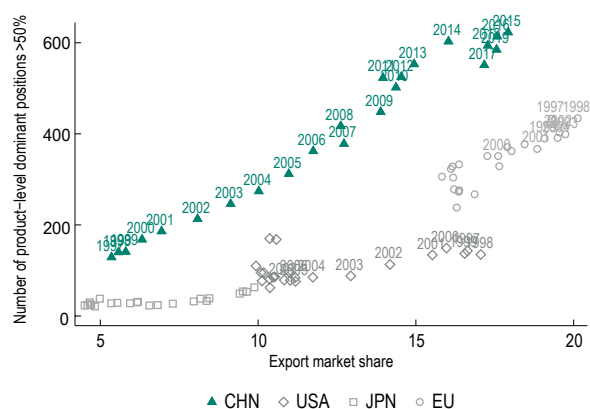1.b – All countries, except the three with a more-than-5% market share



Source: CEPII (BACI database).

Note: Product-level dominant positions defined as products for which an exporter represents more than 50% of worldwide exports.

Since other countries in 2019 fall short of providing a fully suitable benchmark to assess China's situation (given China's leadership, there is no good comparison group), it is useful to compare it to the position of very large exporters over the past decades. This comparison confirms China's particularity. For a similar market share in world exports, China invariably holds a substantially larger number of product-level dominant positions (Figure 2).[3] The comparison is meaningful, because the world market share reached by China, even in recent years, has been surpassed by at least one other big exporter (USA, Japan, EU) at some point in time.

Figure 2 – Dominant positions (number of products) and export market share (in %) for large traders, 1997–2019



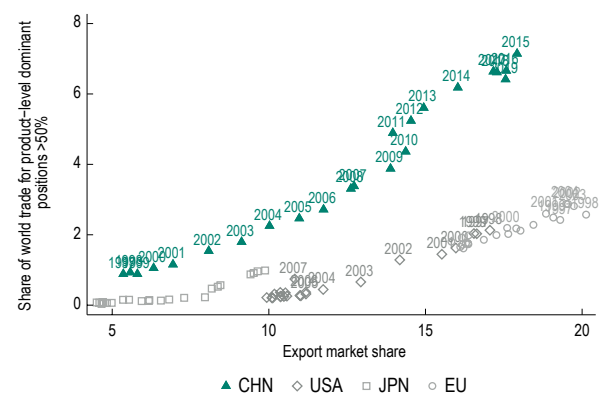Source: CEPII (BACI database).

Note: Product-level dominant positions defined as products for which an exporter represents more than 50% of worldwide exports.

One possible explanation for this could be that China holds strong positions in products where, on average, each product accounts for a smaller share of world trade, in comparison to other products. This is not the case. Measuring the importance

(3) Figure A.1 in Appendix A shows that the same pattern holds when defining product-level dominant positions using 40% or 60% of world trade as thresholds instead of our benchmark 50%.

of China's dominant positions through the share of world trade covered instead of the number of products does not alter qualitatively the result (Figure 3). If anything, China's particularity is even more pronounced according to this metric. The current large number of dominant positions for China is significant for two reasons. First, it is larger than the number of dominant positions held by the EU or the US twenty years earlier. In fact, the number of dominant positions reached by China recently is comparable to that obtained by the EU and the US in the early 1970s (see Figure 4, in which products are defined at the more aggregated ISIC 4-digit level). Second, the level of overall trade openness is much higher today than previously. This implies that a dominant position on world export markets has a much larger effect for destination markets today than twenty or fifty years ago. In other words, a larger export share today has larger implications since overall import penetration is high, compared to the not-too-distant past when trade represented a lower share of global goods production and consumption.
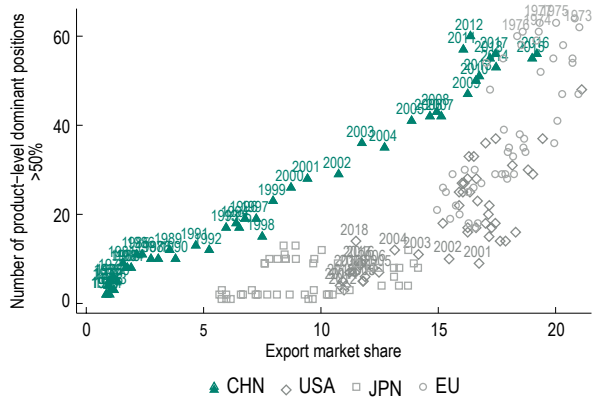
Figure 3 – Dominant positions (share of world trade, %) and export market share (in %) for large traders, 1997–2019



Source: CEPII (BACI database).

Note: Product-level dominant positions defined as products for which an exporter represents more than 50% of worldwide exports.

Figure 4 – Dominant positions (number of products) and export market share (in %): 1970–2018



Source: United Nations (COMTRADE database).
Note: Products defined at the ISIC 4-digit level.

To establish China's particularity more precisely, we carried out product-level econometric estimates of the probability, for a given exporter, of enjoying a dominant position in 2019. The exporter's aggregate export market share, as well as its squared level, are used as explanatory variables. A dominant position is more likely for a large exporter and this relation is convex (see column 1 of Table 1), which is consistent with the convexity displayed in Figures 1, 2 and 3. In all specifications estimated (with or without the square term, including or not a dummy for the US and Japan, restricting the sample to the US, China, Japan and the EU), China's specificity stands out. An indicator for Chinese exports is always found to be positive and statistically significant, showing that, for a given aggregate export market share, the probability of enjoying a dominant position is on average higher for China than for other countries, by 7 to 9 percentage points (see Table 1).

## ■ 2. No straightforward explanation for Chinese dominant positions

Establishing that Chinese exports are dominant for a surprisingly high number of products raises a number of questions and potential explanations. In this section, we check to what extent this could be explained by the context of world export markets, or by a pattern specific to one or two sectors, and whether dominant positions are persistent over time.

### 2.1. Worldwide export concentration is not trending upward

A possible explanation for China's especially large number of dominant positions could lie in a trend toward more concentrated world markets. If that were the case, it would be reflected in the lead world exporter finding itself more often in a dominant position now than it used to be in the past –which could help explain China's specificity.

Table 1 – Product-level dominant position and aggregate export market share, econometric estimates

| Dependent variable | Probability of product-level dominant position (*ikt*) | | | |
| --- | --- | --- | --- | --- |
| | 1 | 2 | 3 | 4 |
| World Market Share | 0.033 | -0.180*** | -0.047 | 0.306 |
| | (0.183) | (0.053) | (0.064) | (0.431) |
| World Market Share Square | 4.099*** | 4.635*** | 4.150*** | 3.595 |
| | (0.688) | (0.458) | (0.544) | (2.093) |
| CHN | | 0.082*** | 0.075*** | 0.090*** |
| | | (0.005) | (0.003) | (0.010) |
| USA | | | -0.024*** | -0.012 |
| | | | (0.003) | (0.012) |
| JPN | | | -0.007*** | 0.018 |
| | | | (0.002) | (0.014) |
| | | | | |
| Observations | 3,456,017 | 3,456,017 | 3,456,017 | 267,736 |
| R-squared | 0.083 | 0.096 | 0.097 | 0.140 |
| Fixed effects | k t | k t | k t | k t |
| Sample | All | All | All | CN-US-JP-EU |

Source: Authors' estimates.

Note: The table reports the results of a linear probability model in which the dependent variable takes the value 1 (otherwise 0) if country (i) has a dominant position, *i.e.* a world market share of more than 50%, in product (k) and year (t). Fixed effects at the product (k) level capture any time-invariant product characteristics that may affect the degree of dominance, while fixed effects at the year (t) level capture world-level business cycles and demand fluctuations. Standard errors in parentheses are clustered at the country and product-year level *** p<0.01, ** p<0.05, * p<0.1.

However, this hypothesis is not supported by the data. Over the 1997–2019 period, the median, cross-product, of the Herfindahl-Hirschman index (HHI) of concentration of world exports does not show any meaningful trend (Figure 5). For products with less concentrated exports, concentration was actually trending slightly downward during the 1990s and then flat or slightly increasing, as shown by the median and first quartile of product-level concentration.

Figure 5 – Export concentration does not show any clear trend (1997–2019)
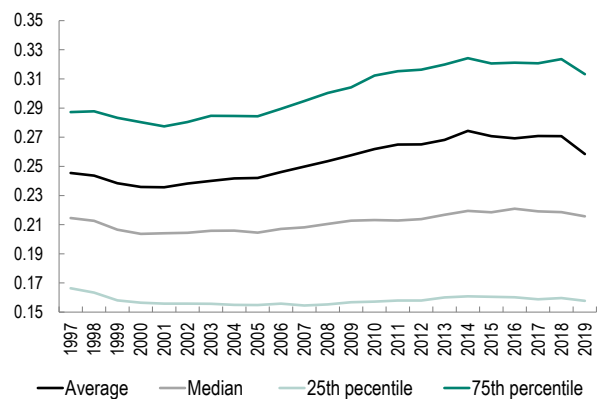


Source: CEPII (BACI database).

Note: HHI is the average Herfindahl-Hirschman Index of exports across all products; medHHI is the median level, p25HHI denotes the first quartile, and p75HHI denotes the third quartile of the Herfindahl-Hirschman Index of exports across all products. Calculations based on HS 6-digit product classifications.

This is consistent with the results found by Bonfiglioli *et al.* (2021). Based on US imports, they find that concentration has fallen in the typical industry, driven by an increase in the number of exporting firms (the extensive margin), while at the same time average revenue per product of top firms has increased. For the most recent period, White *et al.* (2023) also note that "[o]ver the past five years, the largest economies have not systematically diversified the origins of imports".

For products with more concentrated exports (third quartile), a slight downward trend is also visible during the 1990s, while an upward trend is found since then. This increasing concentration is consistent with the increasing number of products dominated by China. However, the number of China's dominant positions already increased from around 100 to 300 over 1997–2005, a period of stagnating global export concentration even for the third quartile of HHI. This pattern suggests that the increasing number of China's dominant positions has not been driven by an overall increase in export concentration.

## 2.2.  A specificity spanning a variety of sectors

Further analysis shows that a few sectors account for the bulk of Chinese dominant positions. This is chiefly the case for textiles and wearing apparel, where more or less one in three Chinese dominant positions are found in the ten years to 2019 (*i.e.* around 170 dominant positions; Figure 6).

*China's specificity is significant within most sectors*

This is followed by metal products (73 products in 2019), chemicals (72) and electronic products (43). The "other" sector[4] accounts for approximately one in six dominant positions.

Assessing sectors' contributions to dominant positions by export value instead of number of products delivers a different picture (Figure 7). In particular, this illustrates the increasing importance of electronic products, accounting for approximately one third of the total in recent years. The "other" sector still appears as an important contributor, as is the case, here, for machinery. In contrast, textiles and wearing apparel play only a minor role in terms of value (one ninth to one eighth of the total in recent years). This is due to the relatively high level of classification detail in these sectors, which overstates their importance when it is measured based on the number of products compared to value, and potentially by lower unit values than other sectors.

(4) The "other" sector includes various manufactured products under chapters 68 to 71 and 90 to 97 of the HS classifications. It includes ceramic products, glass and glassware, stones, optical, measuring or medical instrument or apparatus, musical instruments, arms, clock and watches, furniture and toys. China's dominant positions in these sectors include heterogeneous products, *e.g.* ceramic products, glass products and lenses, clocks and parts, seats, furniture, lamps, and sport equipment.
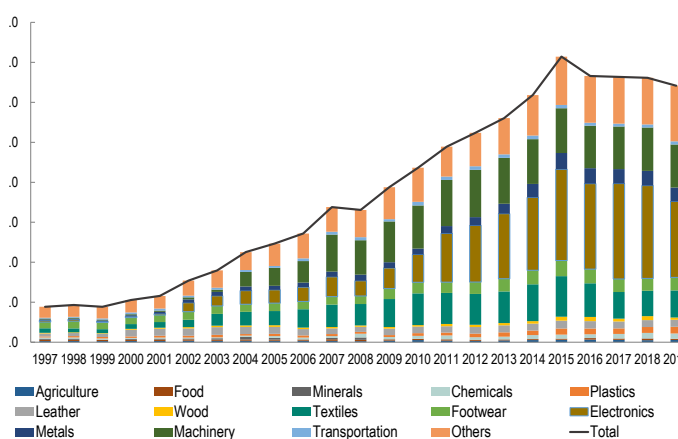
Figure 6 – China's dominant positions (number of products), by sector
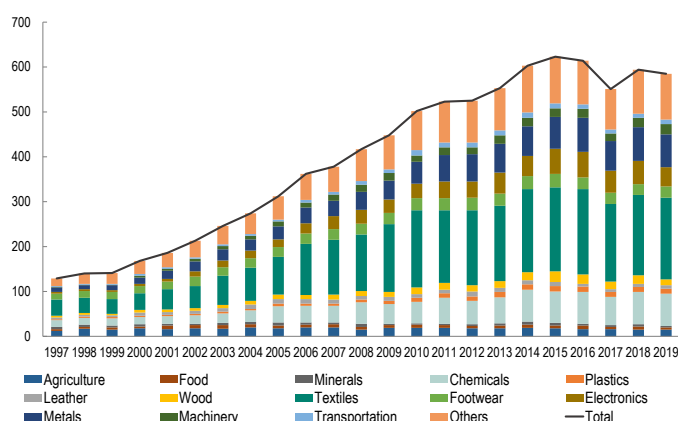
Source: CEPII (BACI database).

Note: Product-level dominant positions defined as products for which an exporter represents more than 50% of worldwide exports. The groups are based on the aggregation of the following HS chapters: Agriculture (01-15); Food (16-24); Minerals (25-27); Chemicals (28-38); Plastics (39-40); Leather (41-43); Wood (44-49); Textiles (50-63); Footwear (64-67); Electronics (85); Metals (72-83); Machinery (84); Transportation (86-89); Others (90-97, 68-71).

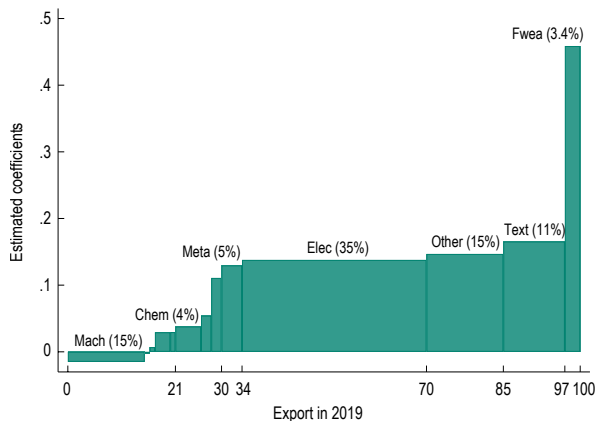Figure 7 – China's dominant positions (share of world exports), by sector

Source : CEPII (BACI database).

Note: Product-level dominant positions defined as products for which an exporter represents more than 50% of worldwide exports. The groups are based on the aggregation of the following HS chapters: Agriculture (01-15); Food (16-24); Minerals (25-27); Chemicals (28-38); Plastics (39-40); Leather (41-43); Wood (44-49); Textiles (50-63); Footwear (64-67); Electronics (85); Metals (72-83); Machinery (84); Transportation (86-89); Others (90-97, 68-71).

Given that sectors differ in size (measured by either number of products or total exports), this breakdown indicates the relative importance of sectors, but not the magnitude of China's specificity within each sector. We address this question by extending the econometric analysis presented above of the product-level probability of holding a dominant position. Introducing a dummy variable for each sector in China allows testing whether, given aggregate export market share, a dominant position is more likely in China in a given sector. The results show that China's specificity is significant within most sectors. It is thus not explained either by China's sector specialization or by its performance in one specific sector (Figure 8).

Figure 8 – China's dominant positions (number of products), econometric estimates by sector



Source : Authors' estimates.

Note: Product-level dominant positions defined as products for which an exporter represents more than 50% of worldwide exports.

Reading note: Chemicals (Chem); Electronics (Elec); Footwear (Fwear); Machinery (Mach); Metals (Metal); Textiles (Text); Others (Other). This figure illustrates the excess propensity of China to command a dominant position in export markets by sector, over and above (controlling for) product and year-specific factors, in 2019. Sectors are ordered from left to right by their estimated excess propensity. The width of each column indicates the share of the sector in Chinese exports in value, and the height is the estimated excess propensity.

China's particularly high incidence of dominant positions is far more pronounced in a handful of sectors. The footwear sector stands out by the intensity of this specificity, with China's probability of holding a dominant position almost 60% larger[5] than expected based on Chinese aggregate exports; however, its importance in the broad picture is limited, given its relatively low share in Chinese total exports (3.4%). Even though the incidence of dominant position is less intense in their case (approximately a 15% higher probability of holding a dominant position), three sectors account for the bulk of China's specificity: textiles, "other" products and, most of all, electronic products, which account for 35% of China's total exports. To the extent that "global concentration [is] most prominent in electronics", as emphasized by White *et al.* (2023, p. 6), this result is not surprising; nonetheless, it is noteworthy that China's dominant positions in this area are outstanding, even by the sector's standards.

*three sectors account for the bulk of China's specificity: textiles, "other" products and, most of all, electronic products*

## 2.3. China's dominant positions, once acquired, persist over time

Another relevant dimension of dominant positions is their persistence over time. After being acquired, most of China's dominant positions remain dominated by China until the end of the period (Figure 9). Specifically, 90% of products dominated by China in 2018 are still dominated in 2019. Further back in time, 72% of products dominated by China in 2000 or 2010 are still dominated in 2019. Such persistence is specific to China The corresponding figures for the rest of the world's dominant positions are one third lower. Such stability in the concentration of exports contrasts with the relative volatility of import dependencies identified using the European Commission criteria (Vicard and Wibaux, 2023). This pattern of persistence further questions the ability of importers to find alternative suppliers of these products.

Figure 9 – Persistence over time in China's dominant positions (number of products)
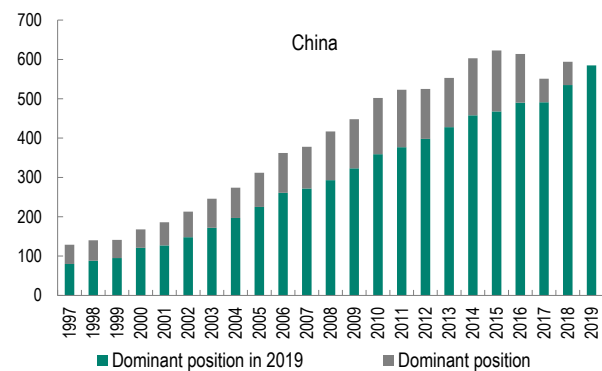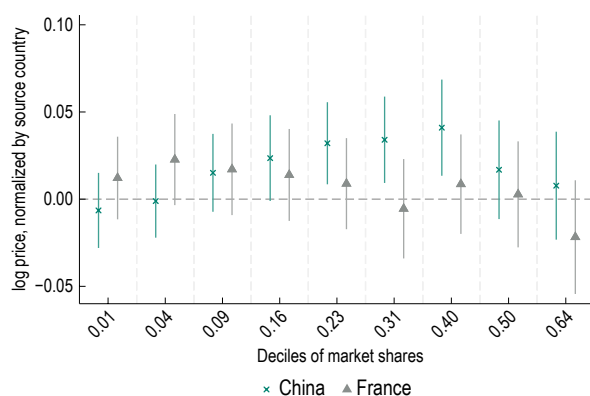


Source: CEPII (BACI database).

Note: Product-level dominant positions defined as products for which an exporter represents more than 50% of worldwide exports.

Reading note: In 2010, out of the 502 products dominated by China, 359 are still dominated in 2019.

## 3. Chinese exporters' pricing strategy is consistent with profit maximization in presence of market power

The statistical evidence presented above consistently points toward China holding an exceptionally large number of dominant positions on world markets. A first step in trying to shed light on the possible underlying explanations and mechanisms is to assess how this outcome relates to prices. Market shares on world markets depend on price competitiveness, which in turn depend on production costs. China's dominant positions could be the consequence of very low prices offered by Chinese exporters in a subset of products. However, the relationship between market shares,

---

(5) The graph reports the coefficient estimated using a logarithm form, and exp(0.45)-1=0.58.

Figure 10 – Prices and aggregate market shares (by destination-product)

Note: The vertical axis is the log price minus the log price in the first decile, which is estimated separately for each source country (China and France); therefore the levels are not comparable. The horizontal axis labels show the minimum values of the corresponding decile. The first decile of the distribution is the reference group and is, therefore, not shown. Deciles of market shares are calculated on the joint distribution of the two countries, considering only the set of common products exported both by China and France to a given European (plus Turkey and UK) market. A market is defined as a destination product, in a given year. The graph shows the point estimates and 95% confidence intervals of the estimates.

Figure 11 – Prices and average firm market shares (by destination-product)

Note: The vertical axis is the log price minus the log price in the first decile, which is estimated separately for each source country (China and France); therefore the levels are not comparable. The horizontal axis labels show the minimum values of the corresponding decile. The first decile of the distribution is the reference group and is, therefore, not shown. Deciles of market shares are calculated on the joint distribution of the two countries, considering only the set of common products exported both by China and France to a given European (plus Turkey and UK) market. A market is defined as a destination x product, in a given year. The graph shows the point estimates and 95% confidence intervals of the estimates.

prices and costs is more subtle than that. A larger market share confers greater market power, which leads profit-maximizing firms to increase their price-cost margin (mark-up).

In order to analyze and compare pricing strategies and their relation to export market shares, we rely on product-level export data, as well as firm-level concentration across exporters by destination, in two countries for which the necessary data are available: China and France. (More details on the methodology are given in the Appendix C.)

We start by assessing the raw data. If exporters coordinate their pricing strategies, this would be reflected in a different relationship across markets (defined here 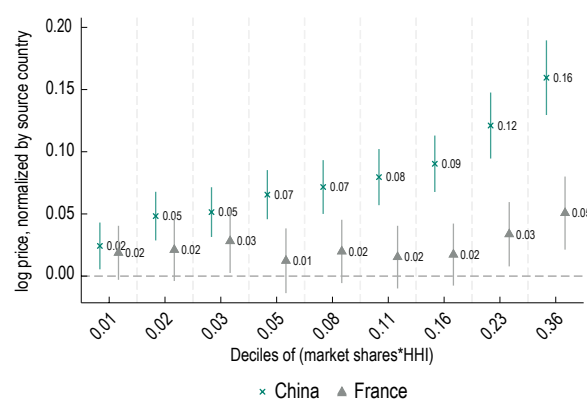as a given product in a given destination market in a given year) between average price and export market share. Figure 10 suggests that this is not the case. After controlling for destination- and product-specific factors for the year concerned (through fixed effects), prices do not appear to be systematically related to market share, neither

*after being acquired, most of China's dominant positions remain dominated by China until the end of the period*

for Chinese nor for French exports. While some differences are observed across deciles, they remain low and statistically insignificant. These results do not lend support to the notion that Chinese exporters coordinate their export pricing strategies.

For uncoordinated exporters, the pricing strategy is not influenced by the exporting country's total market share, but rather by the average market share of the average exporter in the country. This average can be approximated by multiplying

the country's market share times the HHI concentration index of the country's exporters on this market, both in the relevant year (Nocke and Schutz, 2018). Using this computed average exporter market share uncovers a positive relationship with prices, which is statistically significant in the case of China (but not for France). Chinese exporters do set higher prices when they enjoy a higher average market share. The difference is sizeable; our estimates suggest that prices are 17% higher (0.16 log points) for markets belonging to the highest decile in terms of market power, compared to the lowest decile (Figure 11).

This finding suggests that Chinese exporters behave in a manner consistent with profit maximization. The finding that the relationship is more pronounced for China than for France could at least partly be related to the country's size. To dig into the plausibility of this hypothesis, we used canonical theoretical frameworks from the industrial organization literature to compute firms' predicted average mark-up on each market, assuming competition is either à la Cournot (Appendix Figure B.1), or à la Bertrand (Appendix Figure B.2). The upward-sloping relationship between export prices and market power is even clearer in these theory-based estimates than in the "naïve" ones presented in Figure 11.

*Chinese exporters do set higher prices when they enjoy a higher average market share*

This is especially true assuming Bertrand competition, with a 26% difference in average prices between the top and bottom deciles in terms of market share.

We then examine in more detail the relationship depicted in Figure 11. We use the theory-based predicted mark-ups, market by market, as explanatory variables of market-specific average export prices. For both France and China, the estimates show a positive and significant coefficient for this variable (Appendix Table 2). This is consistent with the cruder results by decile in Figure 11. The more accurate assessment allowed by this method demonstrates that the relationship is statistically significant even for France. However, the positive relationship between predicted markups and prices is far stronger for China in all specifications.[6]

While the difference with France is difficult to interpret a priori, the results for China are consistent with canonical theoretical frameworks.[7] In other words, this analysis shows that differences across markets in Chinese export prices are consistent with competitive behavior between profit-maximizing Chinese exporters.

To be clear, this has no relation with possible distortions in the allocation of resources across sectors, whatever their form. This finding refers only to the behavior of firms within a given sector and does not say anything about the average price level set by Chinese exporters. The analysis does not preclude interference of the Chinese authorities in the

*differences across markets in Chinese export prices are consistent with competitive behavior between profit-maximizing Chinese exporters*

sectoral composition of the economy. What it does show is that there is a strong relationship between market shares and prices, mediated (predicted) by mark-ups. Destination markets (country-by-product) in which China has a dominant position exhibit higher, not lower prices. The tight relationship between market shares, mark-ups and prices implies that there is some loss of consumer welfare in markets where China commands a large share, and that this loss may be considerable in markets in which China has a dominant position.

## ▮ Conclusion

At a time when trade relations are increasingly seen through the lens of potential vulnerabilities, the concentration of exports on world markets has attracted much attention. When an exporter accounts for an overwhelming share of world exports of a specific product, it implies that it would be difficult for many importers to substitute this supplier for another, at least in the short term. Such dominant positions may raise concerns about the vulnerability of importers, while exporters enjoying such a strong export position may be given substantial leverage.

Defining dominant positions as a situation where one country accounts for more than half of total world exports, this Policy Brief shows that China is different from other countries. Even when the volume of its aggregate exports is taken into account, it holds far more dominant positions. This finding proves robust to different measures and benchmarks, including in the past 25 years, and including using detailed, product-level data. It is not confined to a single sector but spans several important ones (chiefly electronics, but also textiles/wearing apparel, footwear and machinery). A fine-grained analysis based on individual firms' average market share suggests that this has consequences for pricing behavior, where Chinese firms use their market power to charge significant mark-ups, much more than French exporters.

The exceptionally large number of China's dominant positions remains a conundrum. We cannot exclude that this result is related to the peculiar nature of the Chinese economy, where the Communist Party and the state play an unusually important coordination and intervention role; investigating whether this is the case requires further research. What we can say is that China's dominant position stands out in the recent historical context, and that it is consequential, at least for prices charged on foreign markets. While prices of Chinese imports

*the exceptionally large number of China's dominant positions remains a conundrum*

may be lower than close substitutes, our analysis indicates that they could be still lower if Chinese exporters did not exploit their market power. We hope this work will attract attention to China's unprecedented number of dominant positions, and spur new research to dig into its causes and its consequences.

---

(6) Due to data availability for China, the analysis above is carried out for exports to European (plus Turkey and UK) destination markets (we do not have HHI concentration measures for Chinese exporters in other markets). This may raise a concern about the results for French exporters, whose behaviour may be different in other, non-European markets. To address this issue, we extend the dataset for France alone to include its non-European export destinations and estimate the same relationships in non-European destinations. The results, reported in Appendix Table B.1, show that, while predicted mark-ups for French exporters show a stronger explanatory power for prices outside the EU than within it, this relation remains much weaker than for China.

(7) In theory, the coefficient for predicted mark-ups in explaining prices should be equal to one, while our estimates for China lie between 0.5 and 1.1.

# References

Bonfiglioli, A., Crinò, R. & Gancia, G. (2021). Concentration in international markets: Evidence from US imports. *Journal of Monetary Economics*, 121, 1939.

Bonneau, C. & Nakaa, M. (2020). Vulnérabilité des approvisionnements français et européens. *Trésor-Eco*, 274.

Cadot, O., Carrère, C. & Strauss-Kahn, V. (2011). Export diversification: what's behind the hump? *Review of Economics and Statistics*, 93(2), pp. 590-605.

European Commission (2021). *Strategic dependencies and capacities*.

Gaulier, G. & Zignago, S. (2010). BACI: International Trade Database at the Product-Level. The 1994-2007 Version. *CEPII Working Paper*, No. 2010-23.

Imbs, J. & Wacziarg, R. (2003). Stages of Diversification. *American Economic Review*, 93(1), 6386.

Jaravel, X. & Méjean, I. (2021). Quels intrants vulnérables doit-on cibler ? *Focus*, 057.

Nocke, V. & Schutz, N. (2018). An aggregative games approach to merger analysis in multiproduct-firm oligopoly. *NBER Working Paper,* No. 24578.

Vicard, V. & Wibaux, P. (2023). EU Strategic Dependencies: A Long View. *CEPII Policy Brief*, No. 41, June.

White, O., Woetzel, J., Smit, S., Seong, J. & Devesa, T. (2023). *The Complication of Concentration in Global Trade*. McKinsey Global Institute.

Zenglein, M. (2020). *Mapping and recalibrating Europe's economic interdependence with China*. MERICS China Monitor, November 18.

# About the authors

Sébastien Jean is Research associate at CEPII and professor of economics at Conservatoire National des Arts et Métiers.

Ariell Reshef is Scientific advisor at CEPII, director of research at the Centre d'économie de la Sorbonne, and associate member at Paris School of Economics.

Gianluca Santoni is Economist at CEPII.

Vincent Vicard is Economist and deputy director of CEPII.

Contact: vincent.vicard@cepii.fr

# Appendix A – Additional figure

Figure A.1 – Dominant positions (number of products) and export market share (in %), 1997–2019: alternative thresholds for product-level dominant position
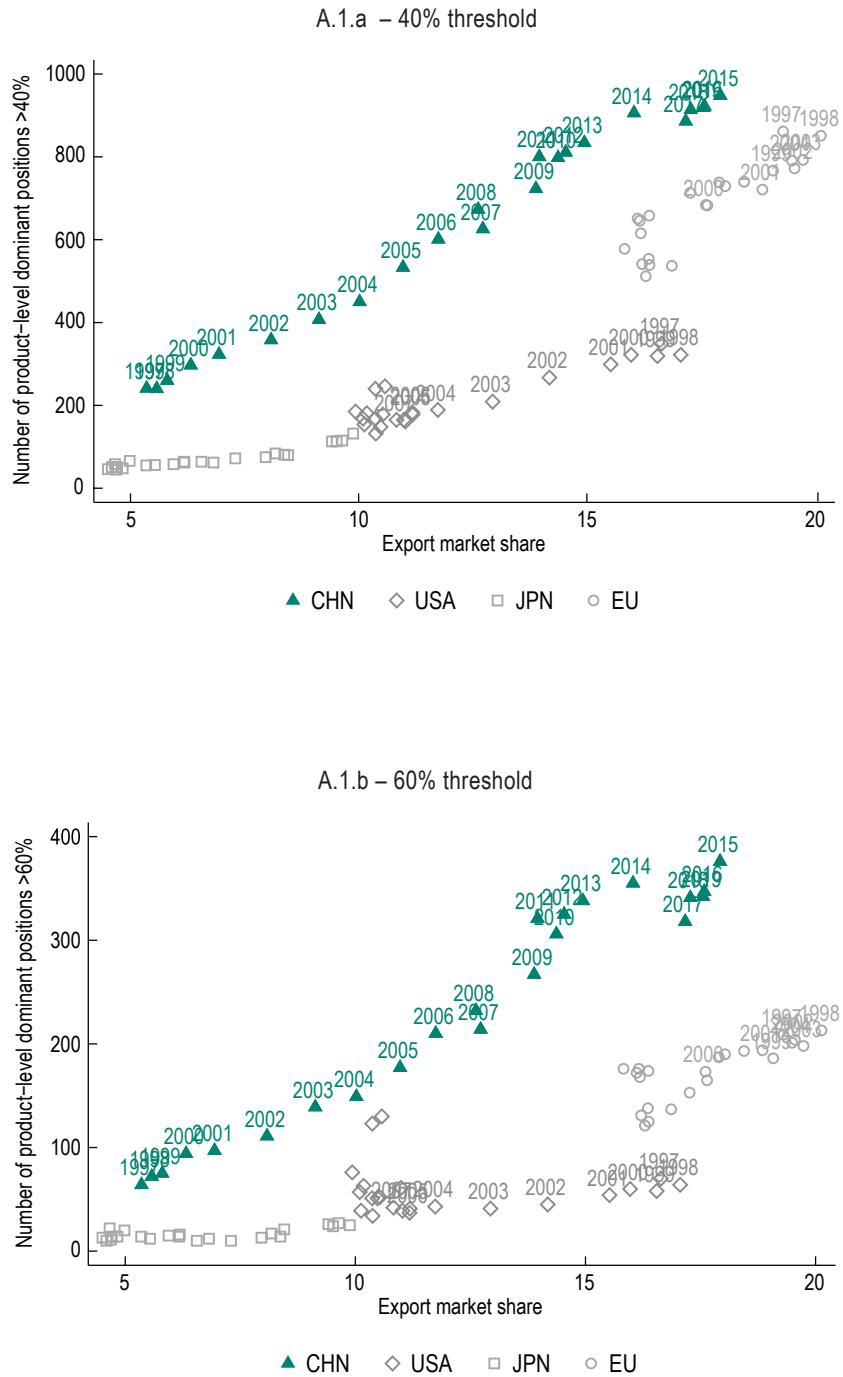
### A.1.a – 40% threshold



### A.1.b – 60% threshold



Source:  CEPII (BACI database).

Note: Product-level dominant positions defined as products for which an exporter represents more than 40% or 60% of worldwide exports respectively.

## Appendix B – Additional figure

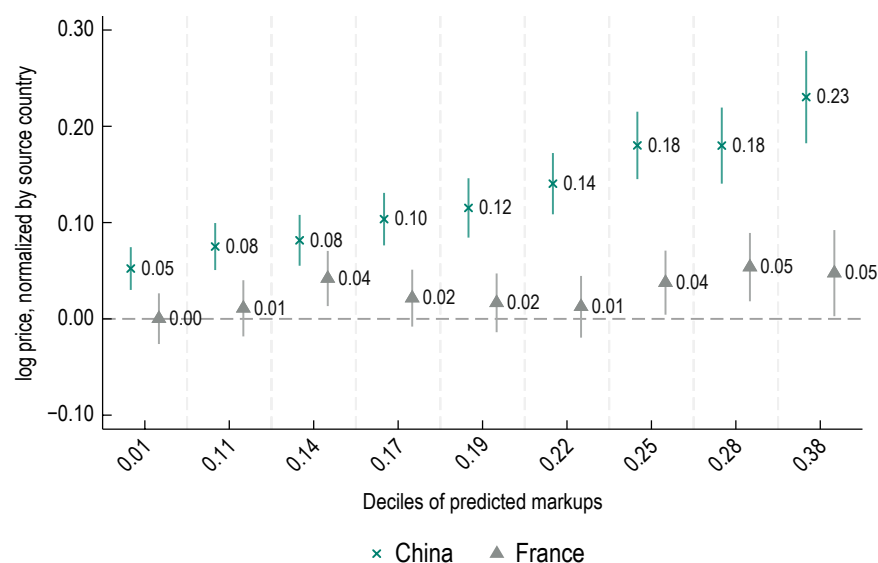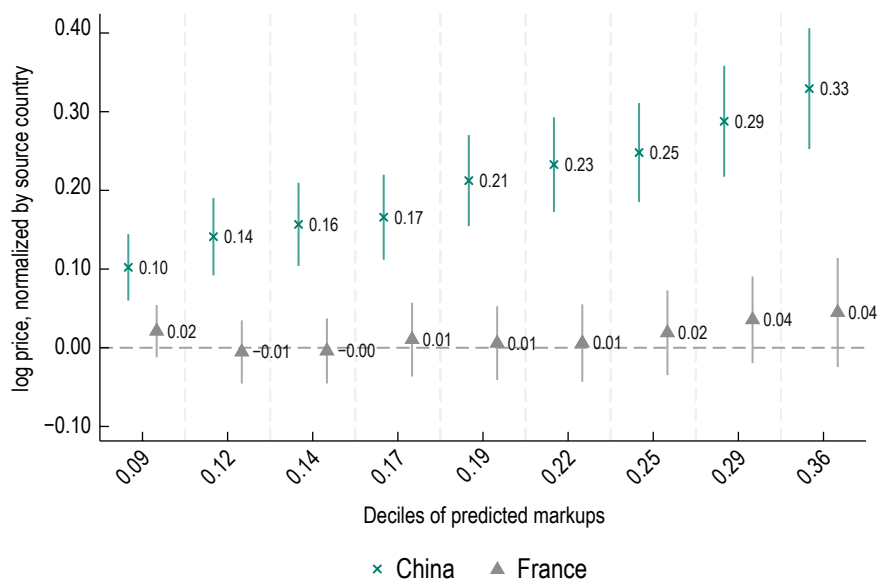Figure B.1 – Prices and average firm predicted markups (Cournot competition)



Sources: Authors' estimates.

Note: The vertical axis is the log price minus the log price in the first decile, which is estimated separately for each source country (China and France); therefore the levels are not comparable. The horizontal axis labels show the minimum values of the corresponding decile. The first decile of the distribution is the reference group and is, therefore, not shown. Deciles of market shares are calculated on the joint distribution of the two countries, considering only the set of common products exported both by China and France to a given European (plus Turkey and UK) market. A market is defined as a destination x product, in a given year. The graph shows the point estimates and 95% confidence intervals of the estimates.

Figure B.2 – Prices and average firm predicted markups (Bertrand competition)



Sources: Authors' estimates.

Note: The vertical axis is the log price minus the log price in the first decile, which is estimated separately for each source country (China and France); therefore the levels are not comparable. The horizontal axis labels show the minimum values of the corresponding decile. The first decile of the distribution is the reference group and is, therefore, not shown. Deciles of market shares are calculated on the joint distribution of the two countries, considering only the set of common products exported both by China and France to a given European (plus Turkey and UK) market. A market is defined as a destination x product, in a given year. The graph shows the point estimates and 95% confidence intervals of the estimates.
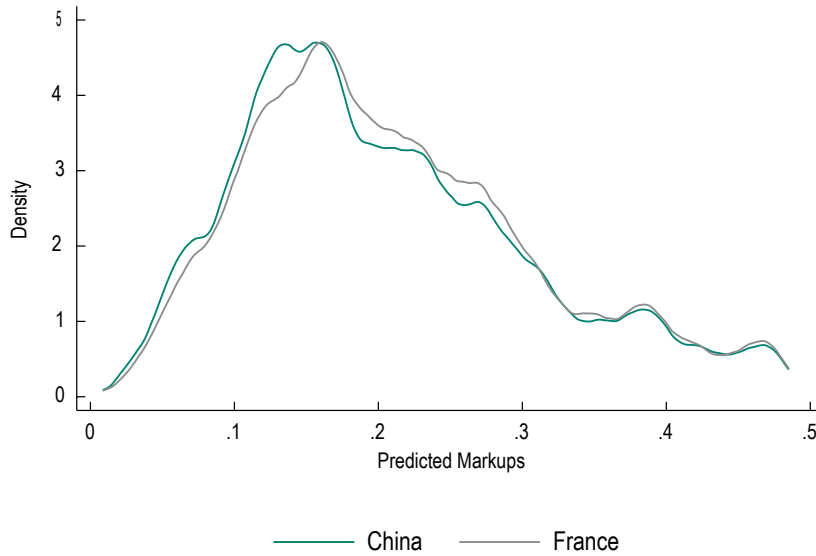
Figure B.3 – Distribution of predicted markups (Bertrand competition)



Sources: Authors' estimates.

Table B.1 – Prices and market power, China and France exporting to European markets

| Dependent variable | Export Price: log(Unit Values) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| μ Bertrand market- product | 0.724*** (0.087) | 0.092* (0.054) | | | 1.065*** (0.203) | 0.234** (0.108) | | |
| μ Cournot market- product | | | 0.573*** (0.061) | 0.145*** (0.040) | | | 0.731*** (0.119) | 0.176*** (0.061) |
| Observations | 159.943 | 262.347 | 160.333 | 261.959 | 140.906 | 141.089 | 141.417 | 141.408 |
| R-squared | 0.774 | 0.807 | 0.775 | 0.807 | 0.780 | 0.797 | 0.780 | 0.797 |
| FEs | gt dt | gt dt | gt dt | gt dt | gt dt | gt dt | gt dt | gt dt |
| Competition | Bertrand | Bertrand | Cournot | Cournot | Bertrand | Bertrand | Cournot | Cournot |
| Etha | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Exp | China | France | China | France | China | France | China | France |
| Sample | All product | All product | All product | All product | Common products-markets pairs | Common products-markets pairs | Common products-markets pairs | Common products-markets pairs |
| Cluster | iso_d | iso_d | iso_d | iso_d | iso_d | iso_d | iso_d | iso_d |

Sources: Authors' estimates.

Note: The table reports the results of a linear regression where the dependent variable measures the price of products exported (approximated by unit values) by Chinese and French firms to the European market. As explanatory variables, we include a measure of the exporter's market power: predicted mark-ups under Bertrand competition $\mu^{Bertrand}_{market,product}$ or Cournot competition $\mu^{Cournot}_{market,product}$. We also include destination year and product year fixed effects to capture additional unobservable factors that may affect pricing strategy. "All product" refers to the sample including all 6-digit HS codes available in the HHI database (*i.e.* 1341; see Appendix C for further details). "Common product-market pairs" refers to a restricted sample where we consider only the subset of products and EU destination markets to which both China and France export. Standard errors in parentheses are clustered at the destination country level *** p<0.01, ** p<0.05, * p<0.1

Table B.2 – Prices and market power for France in European vs non-European destinations (China for reference)

| Dependent variable | Export Price: log(Unit Values) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Bertrand $\mu_{market\text{-}product}$ | 0.698*** (0.083) | 0.073*** (0.028) | 0.091* (0.052) | 0.158*** (0.030) | | | | |
| Cournot $\mu_{market\text{-}product}$ | | | | | 0.570*** (0.059) | 0.159*** (0.025) | 0.144*** (0.038) | 0.251*** (0.028) |
| Observations | 161,295 | 678,392 | 264,368 | 413,749 | 161,315 | 678,372 | 264,430 | 413,665 |
| R-squared | 0.774 | 0.743 | 0.806 | 0.721 | 0.774 | 0.743 | 0.806 | 0.721 |
| FEs | gt dt | gt dt | gt dt | gt dt | gt dt | gt dt | gt dt | gt dt |
| Competition | Bertrand | Bertrand | Bertrand | Bertrand | Cournot | Cournot | Cournot | Cournot |
| Etha | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Exp | China | France | France | France | China | France | France | France |
| Sample | All product EU | All product EU+ExtraEU | All product EU | All product Extra EU | All product EU | All product EU+ExtraEU | All product EU | All product Extra EU |
| Cluster | iso_d | iso_d | iso_d | iso_d | iso_d | iso_d | iso_d | iso_d |

Sources: Authors' estimates.

Note: The table reports the results of a linear regression where the dependent variable measures the price of products exported (approximated by unit values) by Chinese and French firms to the European market. As explanatory variables, we include a measure of the exporter's market power: predicted mark-ups under Bertrand competition $\mu_{market,product}^{Bertrand}$ or Cournot competition $\mu_{market,product}^{Cournot}$. We also include destination year and product year fixed effects to capture additional unobservable factors that may affect pricing strategy. "All product" refers to the sample including all 6-digit HS codes available in the HHI database (*i.e.* 1341; see Appendix C for further details). "Common product-market pairs" refers to a restricted sample where we consider only the subset of products and EU destination markets to which both China and France export. Standard errors in parentheses are clustered at the destination country level *** p<0.01, ** p<0.05, * p<0.1

# Appendix C – Technical Appendix

## C.1    Market shares, markups and prices

Our methodology builds on Atkeson and Burstein (2008) and Neary (2016), which are models of nested constant elasticity of substitution (CES) multi-product oligopoly.[1] Consumers in some destination market consume many goods, and substitute across these goods with elasticity $\eta$. Within each good $g$ there can be many varieties (differentiated by brands, firms, source countries, etc.). Within a good $g$, consumers substitute across varieties with elasticity $\sigma_g$. Suppliers have monopoly power of varying degrees over their varieties. When setting their prices suppliers act strategically, and take into account their influence on other suppliers within a good, but ignore the potential influence their actions may have on other goods.

We model competition within a good either *a la* Bertrand (price competition) or *a la* Cournot (competition on quantities). In both cases, a supplier that commands a greater share of the market (in equilibrium) also charges a higher mark-up (the difference between price and costs) within that market.

Consider the market share of a supplier $\omega$ from origin country $o$ selling in destination $d$ good $g$, $S_{odg}(\omega)$. It is convenient to start by computing the Lerner index, which is the difference between price and marginal cost as a share of the price, $L = (P - MC)/P$. If competition is *a la* Bertrand, then the Lerner index is

$$L_{odg}^{B}(\omega) = \frac{1}{\sigma_g\left[1 - S_{odg}(\omega)\right] + \eta S_{odg}(\omega)} \tag{1}$$

and if firms compete *a la* Cournot, then

$$L_{odg}^{C}(\omega) = \frac{1}{\sigma_g}\left[1 - S_{odg}(\omega)\right] + \frac{1}{\eta}S_{odg}(\omega) \ . \tag{2}$$

Here we assume that $\eta$ and $\sigma_g$ do not vary by destination. We then use the Lerner index to compute markups.

$$\mu = P/MC = 1/\left(1 - L\right). \tag{3}$$

## C.2    Measuring market shares and elasticities

In order to measure the markup that is mandated by the model delineated above, we must have information on $\eta$, $\sigma_g$ and $S_{odg}(\omega)$. Previous applications of this model have used $\eta = 1$ (or slightly above). This implies constant expenditure shares and very little substitutability across goods within a destination. Given the high degree of disaggregation that we use (HS 6-digit), we think that this value is too low, and we use $\eta = 2$. The results are not qualitatively affected when we use higher values of $\eta$. We obtain estimates of $\sigma_g$ from CEPII's Product Level Trade Elasticities database.[2]

We do not observe firm level data, so we compute market shares at the origin, destination and product level. Breinlich, Fadinger, Nocke & Schutz (2022)[3] show that the average market share of exporters from an

---

[1] Atkeson, A., & Burstein, A. (2008). Pricing-to-market, trade costs, and international relative prices. *American Economic Review*, 98(5), 1998–2031. Neary, J. P. (2016). International trade in general oligopolistic equilibrium. *Review of International Economics* 24(4), 669–698.

[2] Fontagné, Lionel and Guimbard, Houssein and Orefice, Gianluca, Product-Level Trade Elasticities (December 16, 2019). CEPII Working Paper No 2019-17, Available at SSRN: https://ssrn.com/abstract=3526933 or http://dx.doi.org/10.2139/ssrn.3526933.

[3] Breinlich, H., Fadinger, H., Nocke, V., & Schutz, N. (2022). "Gravity with Granularity". Working paper, University of Mannheim.

origin $o$ in a destination $d$ and good $g$ is approximately equal to the origin country's market share times the Herfindahl–Hirschman Index of exporters along those same dimensions:

$$\overline{S}_{odg} \simeq S_{odg} \times HHI_{odg} \tag{4}$$

times a term that varies only by destination market. We will ignore this term here as we will absorb this using destination fixed effects in the application below. We have $HHI_{odg}$ for only two origin countries: China and France. This constrains our analysis to these countries.

Another difficulty arises from the fact that while we observe trade flows at the HS 6-digit level, we do not observe total expenditure on a good in a destination at the same level of aggregation. Therefore, in order to compute $S_{odg}$ we use the share of export sales (obtained from CEPII's BACI dataset), $S^x_{odg}$ times the share of total imports in total expenditure on good $g$ in destination $d$,

$$S_{odg} = S^x_{odg} \times (1 - S_{ddg}) \ . \tag{5}$$

The share of domestic firms in total expenditure $S_{ddg}$ is available from CEPII's TradeProd dataset, but only at a higher level of aggregation (9 manufacturing industries).[4] This turns (5) into

$$S_{odg} \simeq S^x_{odg} \times \left(1 - S_{dd,i(g)}\right) \ , \tag{6}$$

where $i(g)$ denotes the industry that includes good $g$. Eventually, we use

$$\overline{S}_{odg} \simeq S^x_{odg} \times \left(1 - S_{dd,i(g)}\right) \times HHI_{odg} \tag{7}$$

as our measure of the average market share of firms from $o$ in destination $d$ in good $g$. We use $\overline{S}_{odg}$ instead of $S_{odg}(\omega)$ to compute average Lerner indices and corresponding average markups.

## Application

We use (3) to compute "predicted markups" $\mu_{odg}$ for the two countries for which we have the HHI data to do so: China and France. Without loss of generality, we can now drop the origin index.

If the model were a perfect predictor of prices and markups given marginal costs, then we could write

$$P_{dg} = \mu_{dg} MC_{dg} \ , \tag{8}$$

where $P_{dg}$ is the observed price inclusive of monopoly power and $MC_{dg}$ includes the impact of trade barriers. In this case, we can write

$$P_{dg} = \mu_{dg} MC_g \tau_{dg} \ , \tag{9}$$

where $MC_g$ is the marginal production cost and $\tau_{dg}$ captures ad valorem trade barriers. Taking logs we can write

$$\ln P_{dg} = \ln \mu_{dg} + \ln MC_g + \ln \tau_{dg} \ . \tag{10}$$

We estimate a version of (10) separately for China and France. If trade barriers have component that is good-specific (e.g., MFN) and another one that is destination specific (in fact, bilateral), then we can write

$$\ln P_{dg} = \ln \mu_{dg} + \ln MC_g + \ln \tau_d + \ln \tau_g \ . \tag{11}$$

We absorb $\ln MC_g$ and $\ln \tau_d$ with good and destination fixed effects, respectively. If good-specific trade barrier variation is not correlated with market shares and mark-ups from a given origin (they should not if these are non-discriminatory, like MFN tariffs), then the following regression

$$\ln P_{dg} = \beta \ln \mu_{dg} + \alpha_g + \alpha_d + \varepsilon_{dg} \ , \tag{12}$$

will be an unbiased and consistent estimator of the influence of markups on prices, where $\alpha_g$ and $\alpha_d$ are good and destination specific fixed effects, respectively. The destination specific fixed effects also correct for the missing destination-specific component in (4).

[4]Mayer T., Santoni G. and Vicard, V. (2023) The CEPII Trade and Production Database, CEPII Working Paper 2023- 01 , January 2023 , CEPII.

## Policy Brief

### CEPII

RESEARCH AND EXPERTISE
ON THE WORLD ECONOMY