

Exposure of Spanish firms to imports of critical inputs from China: a survey-based analysis

Article 02
14/10/2024

<https://doi.org/10.53479/37836>

Rationale

High trade dependency on China could pose a risk to the Spanish economy in the event of trade disruptions or if geopolitical tensions were to escalate. This article analyses the evidence from a module in the Banco de España Business Activity Survey (EBAE), harmonised with the Banca d'Italia and the Deutsche Bundesbank, asking Spanish firms about their dependence on critical inputs imported from China.

Takeaways

- 10% of Spanish firms import critical inputs from China. Within manufacturing, 20% of Spanish firms do so, a figure similar to Italy's 17%, but less than Germany's 34%.
- Only 22% of Spanish manufacturing firms that import critical inputs from China have adopted measures to reduce their exposure. A total of 30% and 40% of their Italian and German counterparts, respectively, have already adopted strategies to reduce such exposure.
- Among the Spanish manufacturing firms that have taken measures to reduce their dependence on critical inputs from China, half have replaced Chinese suppliers with others located in the EU. This is also the preferred strategy of Italian and German firms.

Keywords

China, international trade, imports, geopolitical risks, open strategic autonomy.

JEL classification

E66, F13, L25.

Authors:

Irina Balteanu
International Economics and Euro Area
Department. Banco de España

Alejandro Fernández Cerezo
Economic Developments Department
Banco de España

Javier Quintana
Economic Developments Department
Banco de España

China as the main source of Spain's and the EU's extra-EU imports

In recent years, global supply chains have come under significant strain as a result of the pandemic, the war in Ukraine, the conflict in the Middle East and the growing US-China trade rivalry, among other factors. These developments have prompted considerable concern about the fragility of European economies' supply chains and the possible overdependence on some non-EU suppliers, particularly for strategic goods. As a key supplier for the world economy, escalating trade restrictions on China could trigger severe disruptions to trade and global economic activity.¹ Some recently adopted measures, such as the EU's decision to raise tariffs on imports of Chinese electric vehicles and China's investigation into pork and dairy imports from the EU, are indicative of a likely increase in EU-China trade fragmentation.

In 2023 China was the main source of extra-EU imports of goods for Spain and the EU as a whole, accounting for 20% in both cases, some 7 pp more than the second largest supplier (the United States). These shares have tripled since the early 2000s. If we include intra-EU trade, China is second only to Germany as the largest supplier of goods to Spain. By contrast, China receives a relatively small share of Spanish and EU goods exports (5.3% and 8.8%, respectively, in 2023), resulting in these two economies having a high trade deficit with China. In addition, in many product categories, imports from China account for a high share of total extra-EU imports, which is reflected in the high bilateral concentration of extra-EU imports with respect to China. The difference between the bilateral concentration of imports with respect to China and to the United States is also noteworthy² (see Chart 1.a). A European Central Bank (ECB) telephone survey of large multinationals operating in the EU also suggests that, for most of them, China is not only the main supplier of key inputs for their business, but also the main risk to their sector's value chains.³

China plays an even more important role in the imports of some "high dependency" products, deemed as such because they are sourced from a few suppliers and in addition are scarce in the EU and hard to substitute.⁴ They are therefore products that are particularly vulnerable to potential disruptions to international trade flows. Some of them, such as computers, optical devices,

1 See, for example, Campos, Estefania-Flores, Furceri and Timini (2023), who show that an extreme scenario where the world economy splits into two blocs (East and West) could have sizeable effects in terms of trade and welfare, with trade between the two blocs falling by 20-30%.

2 Bilateral import concentration is measured by weighting the share of imports for each group of products for which the trading partner is the main supplier by the import concentration index of the respective group of products. The product-level concentration index is measured, using a Herfindahl-Hirschman index, as the squared sum of the shares from the different trading partners. See Ioannou et al. (2023) for more details on the methodology.

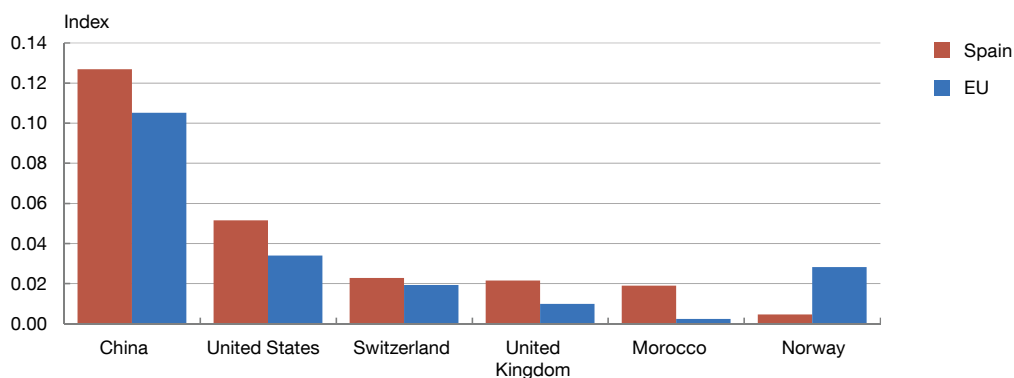
3 Attinasi, Ioannou, Lebastard and Morris (2023).

4 See European Commission (2021) and Ioannou et al. (2023), which calculate three trade dependency indicators: import concentration (calculated, using the Herfindahl-Hirschman index, as the squared sum of the shares from the different trading partners); scarcity (ratio of extra-EU imports to intra- and extra-EU imports); and substitutability (i.e. the possibility of replacing extra-EU imports with European exports, measured as the ratio of extra-EU imports to total exports).

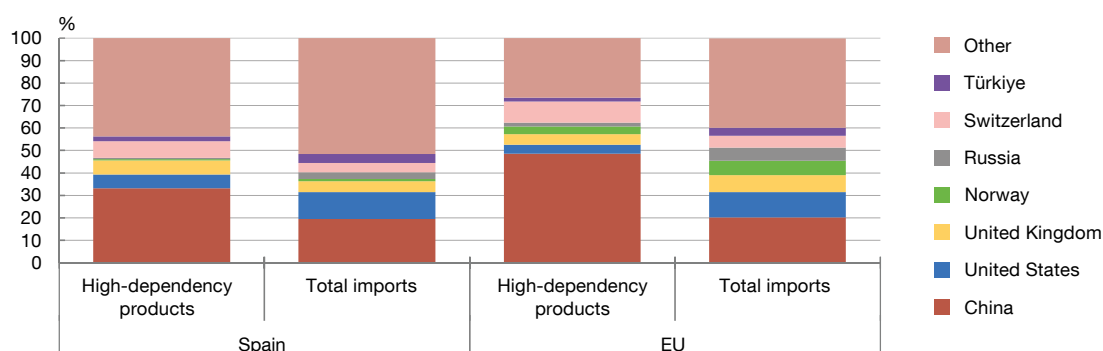
Chart 1

China is the main source of trade vulnerability for Spain and the EU, both by volume and by concentration and nature of their imports

1.a Bilateral import concentration (2022) (a)



1.b Origin of total imports and of high-dependency products (b)



SOURCES: CEPII-BACI (2022) and Eurostat (2022).

- a Bilateral import concentration is measured by weighting the share of imports for each group of products for which the trading partner is the main supplier by the import concentration index of the respective group of products. The concentration index is calculated as the squared sum of the shares of the different supplier countries (Herfindahl-Hirschman index).
- b Following the methodology in European Commission (2021).



photovoltaic cells and LEDs, are strategically important for the European economy and key to the digital and energy transitions.⁵ In 2022 one-third of Spanish imports and close to one-half of European imports of these products came from China (see Chart 1.b).

This high dependency on China could pose a risk in the event of trade disruptions. A recent example was the shutdown of the Chinese economy due to the pandemic containment measures in 2020, which disrupted the supply of certain goods to Spain and the EU.⁶ Therefore, and given

5 China is also the main source country for almost one-quarter of the raw materials the European Commission identified as being “critical” to the digital and green transitions.

6 Khalil and Weber (2022) and Lafrogne-Joussier, Martin and Mejean (2023) find sizeable adverse effects on European manufacturing output and the activity of French firms, respectively, as a result of the temporary lockdown of the Chinese economy in early 2020 because of the pandemic. Despite being temporary, these effects provide a glimpse of the potential costs of an increase in US-China trade restrictions leading to permanent global trade disruptions.

the complex geopolitical environment, many countries are taking measures to lower their external dependencies, via policies that boost local production of “strategic” products, incentivise the reconfiguration of value chains or introduce foreign direct investment screening mechanisms. In addition, a growing number of firms are considering strategies to make their supply chains more resilient. For example, the above-mentioned ECB survey reveals that more than 75% of the surveyed firms intend to adopt strategies to relocate their production and/or diversify their suppliers over the next five years, versus 40% that did so in the previous five years.⁷ In any event, adjusting trade relations and supply chains may take time, given the challenges and costs involved in changing business models and amending contracts.

The evidence provided by business surveys can be useful for identifying early trends. To such end, the Banco de España, the Banca d’Italia⁸ and the Deutsche Bundesbank⁹ have coordinated to incorporate into their regular business surveys a module of specific questions on the risks that firms perceive China could pose to their supply chains and the possible measures they are considering to mitigate such risks. This module asked firms about dependency on the critical inputs sourced from China, their substitutability with inputs from other suppliers, the measures adopted to reduce their exposure to China and their opinion on a possible escalation of the trade tensions between China and the western economies (including the EU).¹⁰ Critical inputs are those without which an important part of the firm’s production process could not be performed or would be significantly delayed, or the quality of its goods or services would deteriorate.

Exposure of Spanish firms to critical inputs from China

The 2023 Q4 edition of the Banco de España Business Activity Survey (EBAE) included a specific module on Spanish firms’ trade dependency on China. The field work was conducted between 13 and 27 November 2023 and 6,200 firms participated.¹¹

According to the survey, around 10% of Spanish firms import critical inputs from China, with notable cross-sector differences. Specifically, more than 20% of firms in the manufacturing, mining and quarrying and trade sectors depend on critical inputs from China (see Chart 2.a). Half of the firms import these inputs directly, with the other half doing so through intermediaries. Many of the firms that depend on these inputs do not therefore import them directly from China. However, in sectors such as manufacturing and mining and quarrying, most of the importers of critical inputs source them directly from suppliers located in that country. Some manufacturing sub-sectors are even more exposed to China. For example, 80% of pharmaceutical firms, 60%

7 For more details, see Attinasi, Ioannou, Lebastard and Morris (2023). The same trends are observed in the surveys conducted by other institutions, such as the European Bank for Reconstruction and Development (2022) and the European Investment Bank (2023).

8 Bottone, Mancini and Padellini (2023).

9 Deutsche Bundesbank (2023).

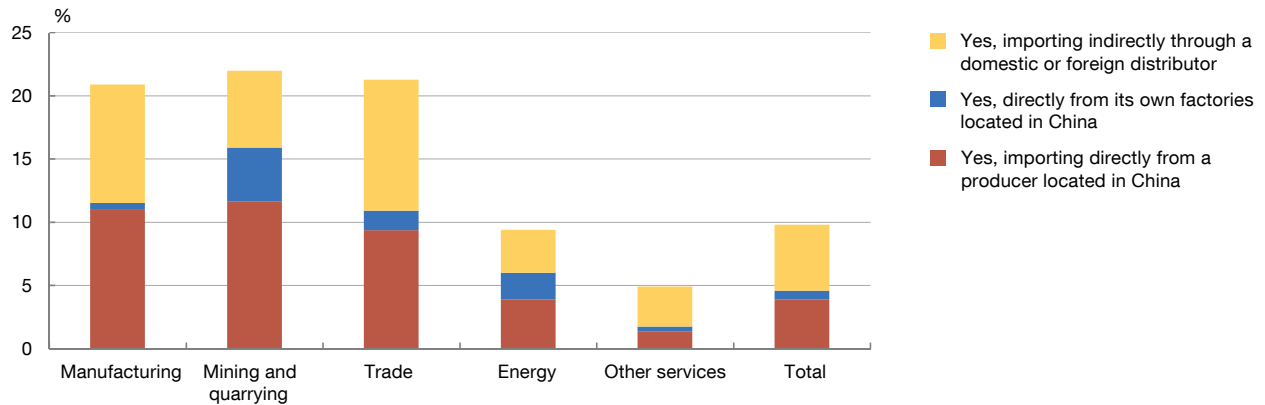
10 The results of this harmonised survey were published in Balteanu et al. (2024).

11 Fernández Cerezo and Izquierdo (2023).

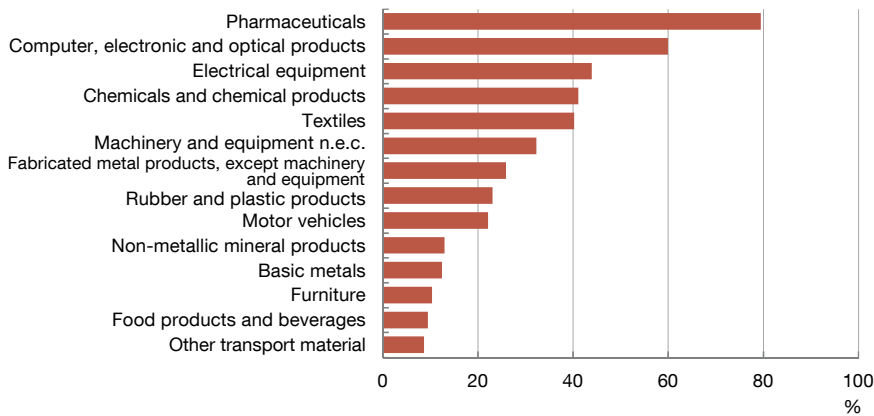
Chart 2

Exposure of Spanish firms to critical inputs from China

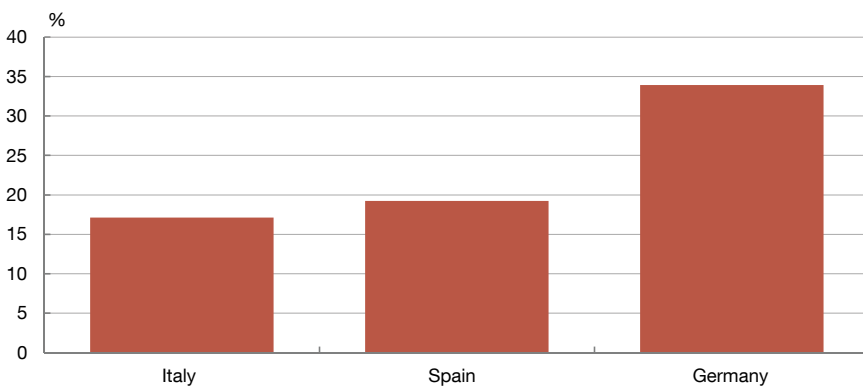
2.a Spanish firms that import critical inputs from China (a)



2.b Spanish manufacturers that import critical inputs from China, by sub-sector (a)



2.c Manufacturing firms that import critical inputs from China, by country (a) (b)



SOURCES: Banco de España, Banca d'Italia, Deutsche Bundesbank and Baiteanu et al. (2024).

- a Firms' responses to the question: "Has your firm bought critical inputs from China in the last 12 months?". Possible answers: 1) "Yes, importing directly from a producer located in China"; 2) "Yes, directly from our own factories located in China"; 3) "Yes, importing indirectly through a domestic or foreign distributor"; and 4) "No". Critical inputs are those without which an important part of the surveyed firm's production process could not be performed or would be significantly delayed, or the quality of its goods or services would deteriorate.
- b Manufacturing firms with more than 20 employees.



of computer, electronic and optical products manufacturers and 40% of chemicals firms and of electrical equipment manufacturers import critical inputs from China (see Chart 2.b).

When asked about the substitutability of the critical inputs from China, two-thirds of the exposed firms said it would be difficult or very difficult to replace them in the event of sudden supply chain interruptions. This is true for around 70% of manufacturing firms and around 90% in sub-sectors such as the manufacture of computer, electronic and optical products, of electrical equipment and of other non-metallic mineral products.

Importers of critical inputs from China are concentrated among the largest, most productive and most export-oriented firms.¹² Indeed, firms that import critical inputs from China are 30% larger than other companies, with this figure rising to nearly 40% in the manufacturing sector. Controlling for size and age, these firms are 18% more productive (10% in manufacturing). They are also more likely to be exporters and typically export a larger share of their output.¹³ These findings are consistent with the literature,¹⁴ which indicates that firms that participate in global trade flows, through both imports and exports, are larger and more productive than those that operate only in the internal market.

Looking at the international comparison, Spanish manufacturing firms with more than 20 employees¹⁵ are similarly exposed to critical inputs from China as their Italian counterparts and considerably less exposed than German firms. In particular, around 20% of firms in Spain and Italy import critical inputs from China, while in Germany nearly one-third of firms do so (see Chart 2.c), reflecting Germany's greater trade exposure to China.

Strategies adopted by manufacturing firms to mitigate supply chain risks¹⁶

According to the responses to the EBAE module, firms that source critical inputs from China are more actively restructuring their supply chains, or have plans to do so, than other companies. Specifically, 53% of such firms report having increased the number of their suppliers, compared

12 Regressions are estimated to establish the relationship between the probability of importing critical inputs from China and firm (i) size, (ii) productivity, (iii) probability of exporting and (iv) exports as a share of total sales. The firm characteristics are taken from the Banco de España's Central Balance Sheet Data Office database for 2021. All of the regressions control for firm age and sector (NACE Rev. 2 division level) and region fixed effects. Regressions (ii)-(iv) also control for firm size.

13 These firms also have higher inventory levels than other companies. Controlling for the same firm characteristics, the inventory-to-total assets ratio is 30% higher for importers of critical inputs from China. This evidence aligns with the literature linking international trade with greater exposure to delivery delays and bottlenecks, leading these firms to accumulate inventories beyond optimal levels (Lafrogne-Joussier, Martin and Mejean, 2023; Alessandria, Khan, Khederlarianm, Mix and Ruhl, 2023). Carreras-Valle (2023) links US trade with China to long and volatile delivery times.

14 See, for example, Bernard, Jensen, Redding and Schott (2012) for a discussion of the characteristics of more export and import-oriented firms.

15 This set of firms allows for a harmonised comparison of the three countries. In addition, to ensure better consistency across the three surveys, the group of firms that indirectly import critical inputs from China only includes companies that also cite this as the most problematic channel in the event of trade fragmentation.

16 To ensure a uniform comparison of responses from Spanish firms with those of their Italian and German counterparts, this analysis focuses on manufacturing firms with more than 20 employees. This section is based in part on the results published in Balteanu et al. (2024).

with 31% of non-exposed companies. In addition, 18% have replaced some of their foreign suppliers with others located closer to, or within, Spain, compared with 12% of non-exposed firms. By firm type, those most actively restructuring their supply chains are large firms and manufacturers of pharmaceutical products, electrical equipment, textiles, machinery and computer, electronic and optical products. However, these figures are lower than those observed in Italy,¹⁷ where two-thirds of manufacturing firms exposed to China report having supplier diversification strategies, compared with 40% of non-exposed firms, while one-third of exposed firms have supplier relocation strategies, compared with 16% of unexposed firms (see Chart 3.a).¹⁸

Thus, a higher proportion of Spanish and Italian firms have opted to increase the number of their suppliers rather than reshoring or nearshoring them. This evidence aligns with overall global trends, which so far indicate a greater propensity towards supplier diversification over relocation strategies.¹⁹

The module questionnaire included a question specifically for firms that import critical inputs from China, asking about their strategies to reduce exposure to these particular inputs. In the case of Spain, most firms have not, as yet, implemented any measures directly geared towards reducing their reliance on these inputs. In particular, 51% of firms have taken no action and have no plans to do so, while 27% were considering implementing some kind of measure over the course of 2024. Only 22% of Spanish firms already had a strategy in place (see Chart 3.b). This is somewhat lower than in Italy (30%), and considerably lower than in Germany, where 40% of firms had already adopted strategies to reduce their reliance on China and only a fraction had no plans to do so.

Among the Spanish manufacturing firms that had already taken measures to reduce their dependency on China, half had replaced Chinese suppliers with others located in the EU, while 20% had switched to suppliers located in Spain (see Chart 3.c). Replacing Chinese suppliers with others from the EU's internal market is also the preferred strategy for Italian and German firms. However, a higher proportion of Italian and, especially, German firms are also opting to replace their Chinese suppliers with non-EU ones (26% and 29%, respectively, compared with 15% in Spain).

An escalation of geopolitical tensions between the western economies and China could have a considerable impact on economic activity. Almost 25% of Spanish firms indicate that their business would be adversely affected due to the potential disruption in trade and investment flows, and the associated rise in uncertainty. These adverse effects would be especially pronounced for manufacturing firms due to their greater exposure to international trade and global value chains, with over 40% reporting that their business would suffer. In addition, a significant share of firms that do not import critical inputs from China could be adversely impacted, mainly through the uncertainty channel (see Chart 4.a). In the manufacturing sector, the vast majority of manufacturers of pharmaceuticals, electrical equipment and computer, electronic and optical products, as well

17 These results are not available for Germany, as the survey did not include this question.

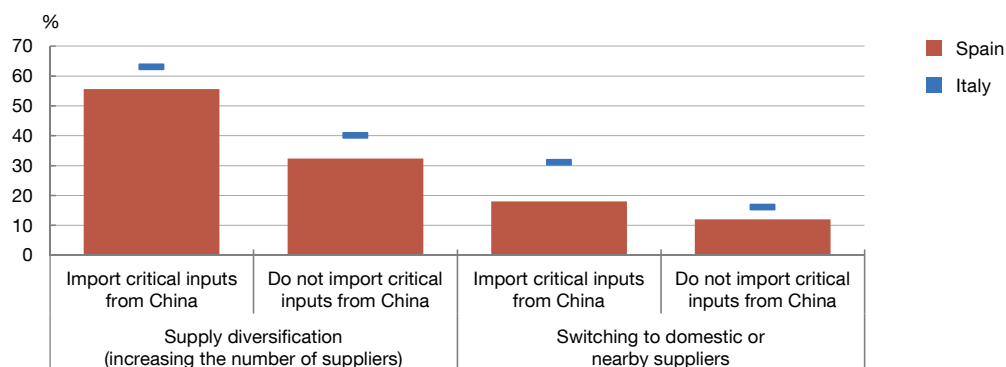
18 Bottone, Mancini and Padellini (2023).

19 See Alfaro and Chor (2023) for a discussion of the recent changes in global value chains.

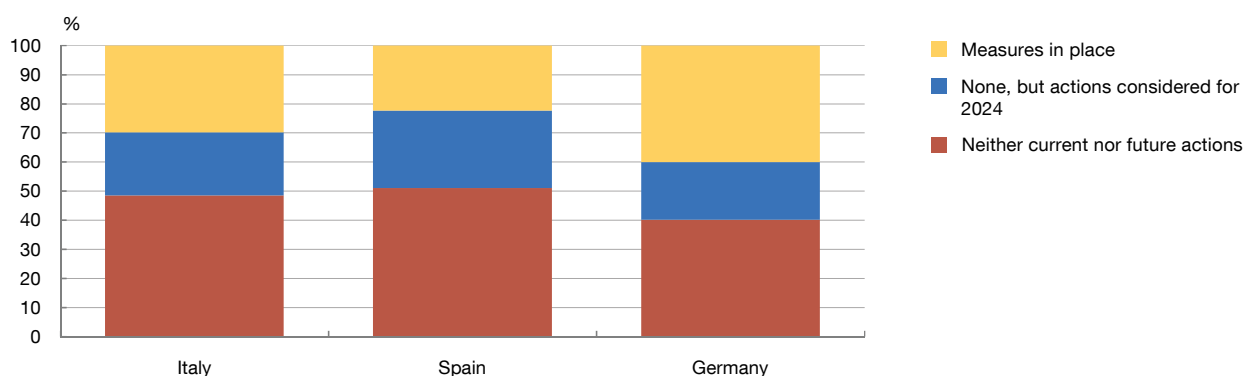
Chart 3

Strategies used by manufacturing firms to reduce supply chain risks and their exposure to China

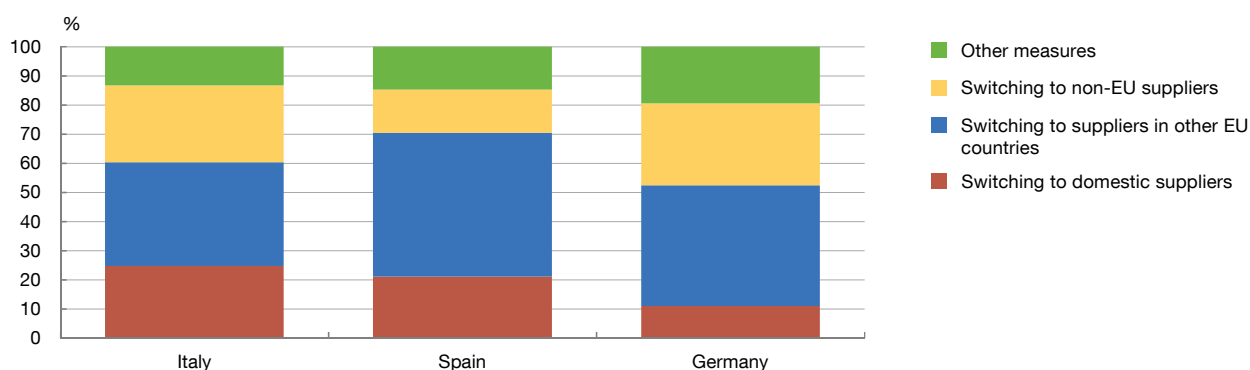
3.a Supply chain reorientation strategies (a)



3.b Measures to reduce exposure to China (b)



3.c Measures in place to reduce exposure to China (b)



SOURCES: Banco de España, Banca d'Italia, Deutsche Bundesbank, Balteanu et al. (2024) and Bottone, Mancini and Padellini (2023).

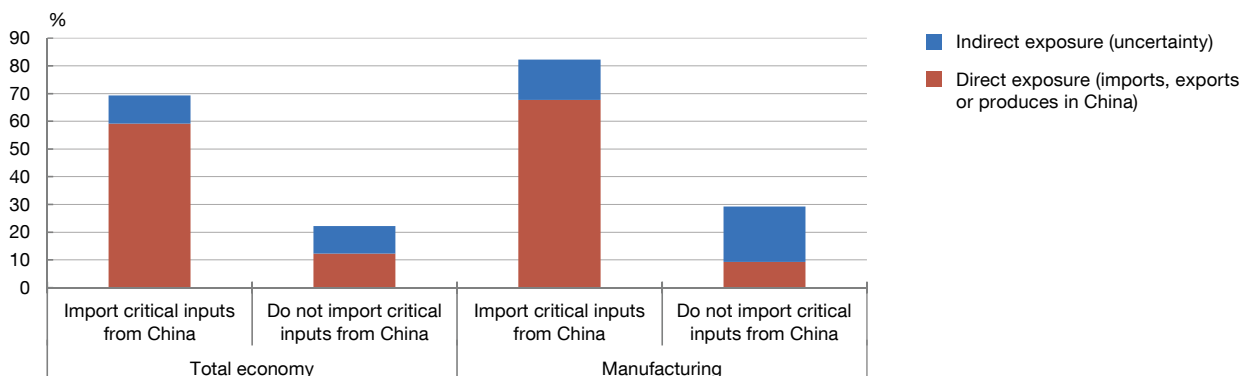
- a** Firms' responses to the question: "Has your firm implemented any of the following measures in 2023, or does it intend to implement any of them in 2024?". Possible answers: 1) "Lengthening the delivery time of products/services to customers"; 2) "Supplier diversification (increasing the number of input suppliers)"; 3) "Replacing foreign suppliers with others located in Spain"; and 4) "Replacing foreign suppliers with others located closer to Spain". Only manufacturing firms with over 20 employees are included.
- b** Firms' responses to the question: "If your firm imports critical inputs from China, has it taken or is it planning to take any measures to reduce its dependence on such imports?". Possible answers: 1) "No, none have been taken and none are planned"; 2) "None have been taken, but some measures are planned for the next 12 months"; 3) "Yes, they have been replaced with inputs produced in Spain or produced in-house"; 4) "Yes, they have been replaced with inputs produced in other EU countries"; 5) "Yes, they have been replaced with inputs produced in other non-EU countries"; and 6) "Yes, measures different from those mentioned above have been implemented". Only Manufacturing firms with more than 20 employees.



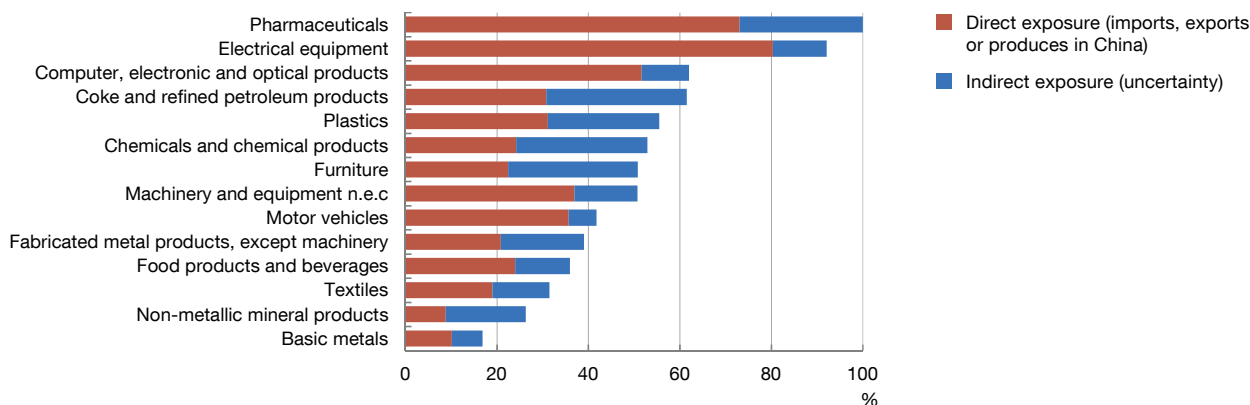
Chart 4

Impact of a potential increase in trade tensions between China and the West

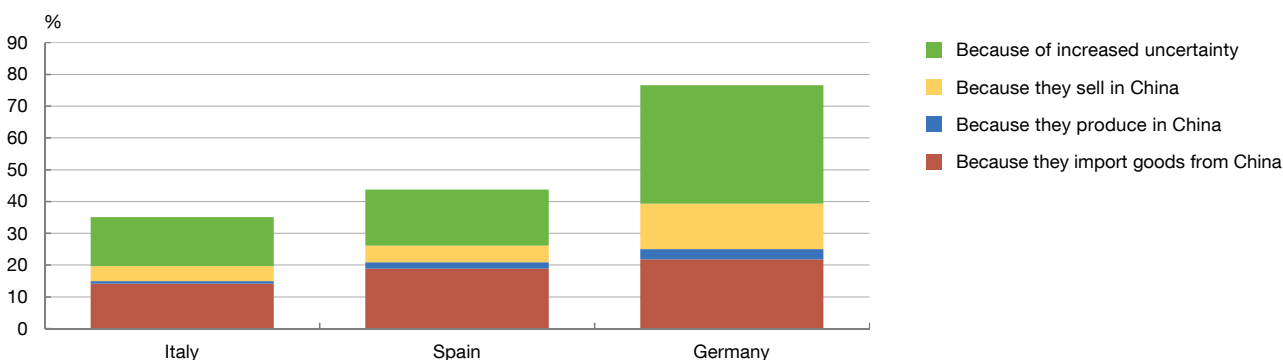
4.a Spanish firms indicating a potentially negative impact from fragmentation (a)



4.b Spanish manufacturing firms indicating a potentially negative impact from fragmentation, by sub-sector (a)



4.c Manufacturing firms indicating a potentially negative impact from fragmentation, by country (a) (b)



SOURCES: Banco de España, Banca d'Italia, Deutsche Bundesbank and Balteanu et al. (2024).

- a Firms' responses to the question: "How do you think your firm would be affected by an increase in tensions between China and western countries (including the EU) in the coming months, potentially resulting in new tariffs, non-tariff measures or restrictions on foreign investment?". Possible answers: 1) "No significant effect"; 2) "Positively"; 3) "Negatively, because our firm uses inputs from China"; 4) "Negatively, because our firm sells (directly or through intermediaries) products and services to firms or consumers in China"; 5) "Negatively, because a portion of our firm/group's production is located in China"; and 6) "Negatively, due to increased uncertainty over future economic developments". "Direct exposure" includes answers 3, 4 and 5. "Indirect exposure" includes answer 4.
- b Manufacturing firms with more than 20 employees.



as those in the chemicals, coke and oil refining industries, believe that their business could be negatively impacted in the event of escalating trade tensions (see Chart 4.b).

Looking at the international comparison, 45% of Spanish manufacturing firms could be adversely affected by an increase in trade tensions, slightly more than Italy's 36%, but significantly less than Germany's 77%, in line with Germany's greater exposure to the Chinese economy (see Chart 4.c). Losing access to inputs from China is one of the main factors that could harm business activity in these three countries, affecting around 20% of manufacturing firms. However, increased uncertainty is identified as a particularly important channel: 18% of Spanish firms cited this as a key channel, compared with 15% of Italian firms and 37% of German firms.

In consequence, numerous firms, even those without direct ties to China, anticipate adverse effects on their business if trade relations worsen, in line with the literature linking geopolitical tensions, uncertainty and economic activity.²⁰ In particular, increased uncertainty could amplify the effect of geopolitical shocks on the domestic economy.

In sum, a worsening of trade relations with China, which the restrictions recently announced by European and Chinese authorities have only made more likely, could be particularly detrimental for the Spanish and European economies, given the existing close trade ties and the highly concentrated supply of some strategic goods. However, most Spanish firms exposed to critical inputs imported from China have not yet taken measures to reduce their exposure to the country. This stands in contrast to the higher propensity to adopt or plan strategies demonstrated by Italian firms (whose exposure to China is comparable to that of Spanish companies) and especially by German firms (the most exposed).²¹

In a complex global environment marked by escalating trade restrictions, the likelihood of these economic vulnerabilities surfacing could be greater. Against this background, a series of measures have recently been implemented to reduce the European economy's external dependencies, such as the Critical Raw Materials Act, the European Chips Act and other actions under the Open Strategic Autonomy framework designed to bolster the resilience of European production chains against geopolitical shocks. However, these initiatives must be carefully designed and scrutinised, as some could have unintended consequences for the European single market. For instance, these measures should weigh the potential benefits associated with reduced external dependence against the costs of decreased participation in global supply chains, since there is evidence that such participation helps firms manage demand and supply shocks more effectively.²² Similarly, nearshoring and reshoring decisions can also have adverse consequences if they diminish competition in the internal market and enhance the market power of domestic producers.²³ Lastly, any industrial policy decisions aimed at strengthening domestic productive capacity in strategic sectors must be designed to prevent distortions in either the domestic market or the European single market.

20 See, for example, Caldara and Iacoviello (2022) and Baker, Bloom and Davis (2016).

21 See Quintana (2024) for a discussion on how anticipating trade fragmentation can mitigate its consequences.

22 Borin, Mancini and Taglioni (2022) and Bonadio, Huo, Levchenko and Pandalai-Nayar (2021).

23 Ioannou et al. (2023).

REFERENCES

- Alessandria, George, Shafaat Yar Khan, Armen Khederlarian, Carter Mix and Kim J. Ruhl. (2023). "The Aggregate Effects of Global and Local Supply Chain Disruptions: 2020-2022". *Journal of International Economics*, 146(103788). <https://doi.org/10.1016/j.jinteco.2023.103788>
- Alfaro, Laura, and Davin Chor. (2023). "Global supply chains: The looming 'great reallocation'". Working Papers, 31661, National Bureau of Economic Research. <https://doi.org/10.3386/w31661>
- Attinasi, Maria Grazia, Demosthenes Ioannou, Laura Lebastard and Richard Morris. (2023). "Global production and supply chain risks: insights from a survey of leading companies". *ECB Economic Bulletin*, 7/2023. https://www.ecb.europa.eu/press/economic-bulletin/focus/2023/html/ecb.ebbox202307_01~2a0bcf0b48.en.html
- Baker, Scott, Nicholas Bloom and Steven Davis. (2016). "Measuring Economic Policy Uncertainty". *The Quarterly Journal of Economics*, 131(4), pp. 1593-1636. <https://doi.org/10.1093/qje/qjw024>
- Balteanu Irina, Marco Bottone, Demosthenes Ioannou, Ambre Kuttan, Alejandro Fernández-Cerezo, Michele Mancini and Richard Morris. (2024). "European firms facing geopolitical risk: evidence from recent Eurosystem surveys". *VoxEU*. <https://cepr.org/voxeu/columns/european-firms-facing-geopolitical-risk-evidence-recent-eurosystem-surveys>
- Bernard, Andrew, Bradford Jensen, Stephen Redding and Peter Schott. (2012). "The empirics of firm heterogeneity and international trade". *Annual Review of Economics*, 4(1), pp. 283-313. <https://doi.org/10.1146/annurev-economics-080511-110928>
- Bonadio, Barthélémy, Zhen Huo, Andrei Levchenko and Nitya Pandalai-Nayar. (2021). "Global Supply Chains in the Pandemic". *Journal of International Economics*, 133(103534). <https://doi.org/10.1016/j.jinteco.2021.103534>
- Borin, Alessandro, Michele Mancini and Daria Taglioni. (2022). "Integration in global value chains might not increase exposure to risk after all". *VoxEU*. <https://cepr.org/voxeu/columns/integration-global-value-chains-might-not-increase-exposure-risk-after-all>
- Bottone, Marco, Michelle Mancini and Tullia Padellini. (2023). "Navigating Fragmentation Risks: China Exposure and Supply Chains Reorganization among Italian Firms". *SSRN Electronic Journal*. <https://dx.doi.org/10.2139/ssrn.4569465>
- Caldara, Dario, and Matteo Iacoviello. (2022). "Measuring Geopolitical Risk". *American Economic Review*, 112(4), pp. 1194-1225. <https://doi.org/10.1257/aer.20191823>
- Campos, Rodolfo, Julia Estefanía-Flores, Davide Furceri and Jacopo Timini. (2023). "Geopolitical fragmentation and trade". *Journal of Comparative Economics*, 51(4). <https://doi.org/10.1016/j.jce.2023.06.008>
- Carreras-Valle, María-Jose. (2023). "Increasing Inventories: The Role of Delivery Times". https://mjcarrerasv.github.io/website/W6_1022_v9.pdf
- Deutsche Bundesbank. (2023). "Germany as a business location: selected aspects of current dependencies and medium-term challenges". Monthly Report, September. <https://www.bundesbank.de/resource/blob/916770/8239551309f181ee6995aa3619a45673/mL/2023-09-wirtschaftsstandort-data.pdf>
- European Investment Bank. (2023). *EIB Investment Survey: European Union overview*. https://www.eib.org/attachments/lucalli/20230285_econ_eibis_2023_eu_en.pdf
- European Bank for Reconstruction and Development. (2022). *Global supply chains in turbulence*. Transition Report 2022-23. <https://2022.tr-ebrd.com/global-supply-chains-in-turbulence/>
- European Commission. (2021). "Strategic dependencies and capacities". Commission Staff Working Document. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2021:352:FIN>
- Fernández-Cerezo, Alejandro, and Mario Izquierdo. (2023). "The Banco de España Business Activity Survey: 2023 Q4". *Economic Bulletin - Banco de España*, 2023/Q4, 07. <https://doi.org/10.53479/35654>
- Ioannou, Demosthenes, Javier Pérez, Ana Almeida, Irina Balteanu, Iván Kataryniuk, Hans Geeroms, Isabel Vansteenkiste, Pierre-François Weber, Maria Grazia Attinasi and Krist Buys. (2023). "The EU's Open Strategic Autonomy from a central banking perspective - Challenges to the monetary policy landscape from a changing geopolitical environment". Occasional Papers, 311, European Central Bank. <https://doi.org/10.2866/602215>
- Khalil, Makram, and Marc-Daniel Weber. (2022). "Chinese Supply Chain Shocks". Discussion Paper, 44/2022, Deutsche Bundesbank. <http://dx.doi.org/10.2139/ssrn.4324203>

- Lafrogne-Joussier Raphael, Julien Martin and Isabelle Mejean. (2023). "Supply Shocks in Supply Chains: Evidence from the Early Lockdown in China". *IMF Economic Review*, 71, pp. 170-215. <https://doi.org/10.1057/s41308-022-00166-8>
- Quintana, Javier. (2024). "The Dynamics of Trade Fragmentation: a Network Approach". Documentos de Trabajo, Banco de España. Forthcoming.

How to cite this document

Balteanu, Irina, Alejandro Fernández Cerezo and Javier Quintana. (2024). "Exposure of Spanish firms to imports of critical inputs from China: a survey-based analysis". *Economic Bulletin - Banco de España*, 2024/Q4, 02. <https://doi.org/10.53479/37836>

Reproduction for educational and non-commercial purposes is permitted provided that the source is acknowledged.

© Banco de España, Madrid, 2024

ISSN 1695-9086 (online edition)