

NOT SO DIFFERENT?: DEPENDENCY OF THE GERMAN AND ITALIAN INDUSTRY ON CHINA INTERMEDIATE INPUTS

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IEP@BU Policy Brief

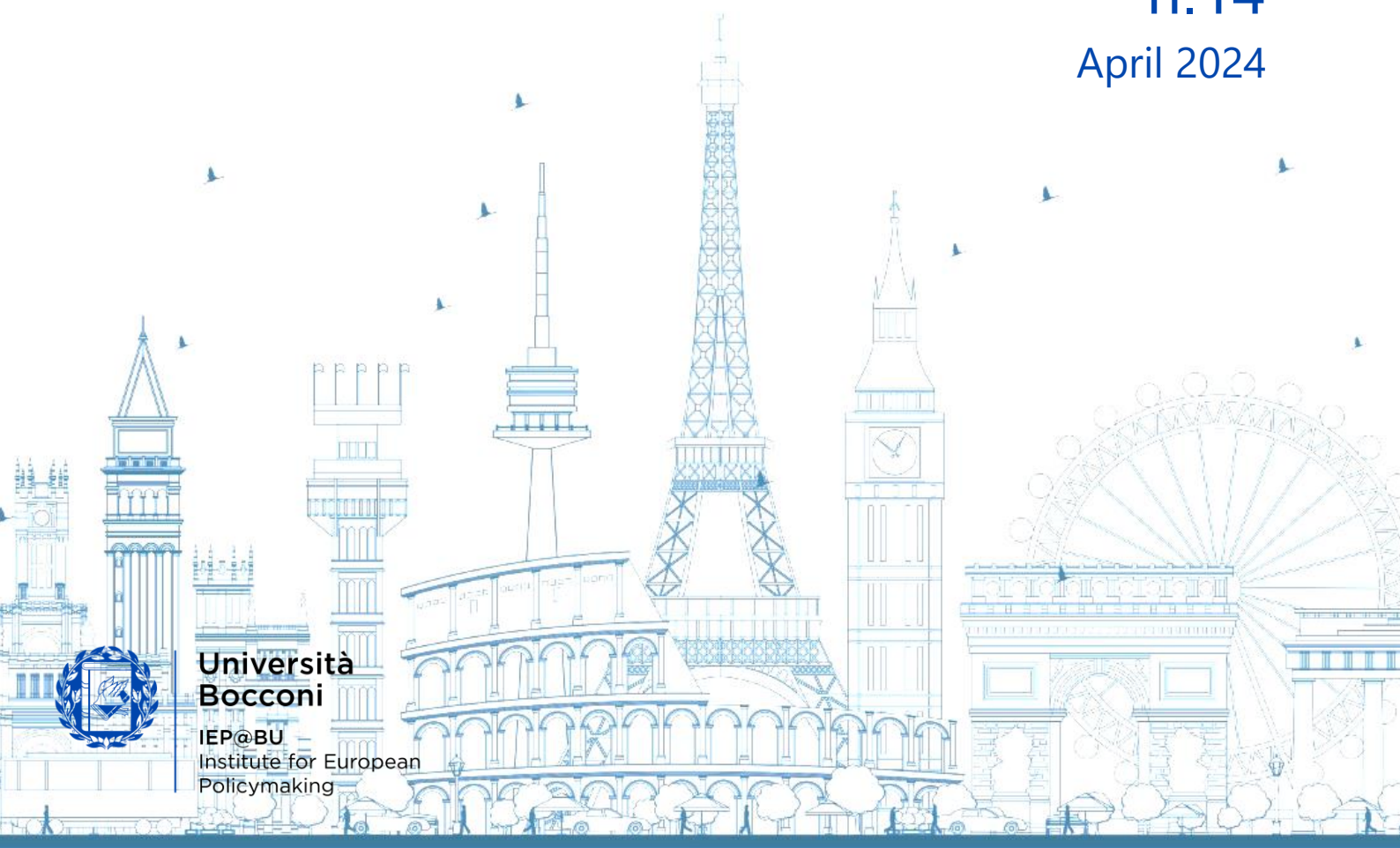
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Introduction

It is often assumed that Germany's economic relations with China are so important that Berlin tends to take a softer stance on China-EU relations than its EU partners – or at least that this used to be the case until most recently. In particular, it is feared that German industry might be more vulnerable to disruptions of the supply of Chinese inputs than other European countries.

However, this impression of a greater dependency of German industry and its supply chains from China is not borne out by the data. Across all sectors, the average intermediate input dependency from China of Germany and Italy are very similar. One finds only a small relative difference across sectors: whereas the Italian textile industry obtains a larger relative share of its inputs from China, the German computer and electronics industry is more dependent on China by comparison.

This Policy Brief compares the dependency of Germany and Italy on China at the intermediate input-level for the industry on average and for the different industrial sectors on the import side¹. Imports from China that go into final consumption are therefore not considered in this study. The analysis relies on the OECD Inter-Country Input-Output (ICIO) database.²

The intermediate input-level is important, because the resilience of supply chains is largely determined by how the upstream supply chains are structured and whether there is a concentration on certain countries.

Nevertheless, it needs to be stressed that this is only one way to analyze the dependence on China. One could also consider the import dependencies of final demand or regarding critical raw materials.

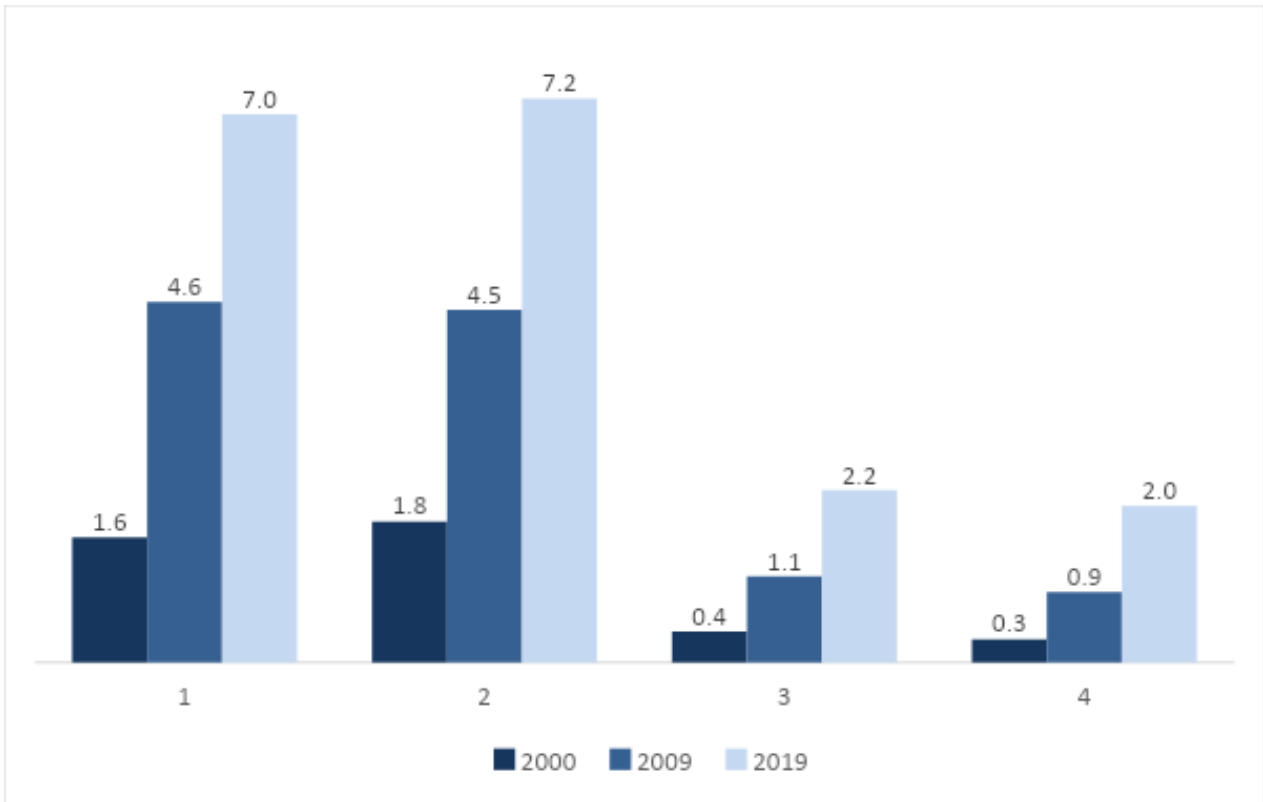
¹For an analysis of the intermediate input dependencies of Germany on China on the export side, see [Busch, Matthes, Sultan, 2023](#).

²One caveat of the ICIO database is that the most recent data available is from 2019. Since then, dependencies on China in both countries could have changed. But it nevertheless enables an ex-post comparison.



Average industry intermediate input-dependency on China

Figure 1: Average industry dependence on Chinese intermediate inputs as percent of foreign intermediate inputs (excluding domestic inputs) and overall intermediate inputs (including domestic inputs).



Sources: OECD ICIO; German Economic Institute

On average, there is a great similarity between German and Italian industry in terms of their respective intermediate input-dependencies on China (see Figure 1). In both countries the share of foreign intermediate inputs (i.e. excluding domestic intermediate inputs) from China has steadily increased from below 2 % in 2000 to around 7 % in 2019. According to that measure, Italy is on average slightly more dependent on Chinese intermediate inputs than Germany.

If domestic intermediate inputs are also accounted for, the Chinese share is considerably smaller for both countries. According to that measure, Germany is slightly more dependent on Chinese intermediate inputs that account now for about 2.2 % of all inputs, than Italy (2 %).

This suggests that the Italian industry on average uses a slightly higher proportion of domestic intermediate inputs than the German industry. This result corresponds to the fact that the German economy is relatively open to trade in comparison with other larger advanced economies, including Italy.

But regardless of whether considering domestic intermediate inputs or not, with a magnitude of around 2 to 7 percent the Chinese share does not seem extraordinarily high for both Germany and Italy. That means, that at least on average on the intermediate input-level the dependency on China seems very moderate and, thus, manageable.



Sectoral analysis intermediate input-dependency on China

Besides the average foreign intermediate inputs dependencies on China of the German and Italian industry, Figure 2 provides a more detailed analysis of the different industry sectors for the year 2019. The classification of the sectors follows ISIC Revision 4.

For Germany, the sector with the highest intermediate input dependence on China is Computers, Electrical and optical equipment (ISIC 26) with a share of 22.1 percent of foreign intermediate inputs. For Italy this is only the second most dependent sector with a share of 15.4 percent. In Italy the sector with the highest intermediate input dependence on China is Textiles, wearing apparel, leather (ISIC 13-15) with 20.1 percent.

In turn, this is the second most dependent sector in Germany with 15.9 percent. Third place follows for both countries the Electrical equipment sector (ISIC 27) with a share of 15.6 percent in Germany and 12.1 percent in Italy. Thus, although on average the dependence on Chinese intermediate inputs does not seem extraordinarily high for both countries, there are sectors where the Chinese share of foreign intermediate inputs is considerable.

From the perspective of the countries supplied, the strong dependency in the electrical industry harbors risks, should geopolitical tensions increase. The supply bottlenecks resulting from the strict zero-Covid strategy in China have already shown how susceptible manufacturing is to disruptions in the supply chains.

A one-sided dependency is therefore strategically unwise, all the more so in the high-tech sector. Thus, a greater diversification of input suppliers would be advisable. The computer and electronics industry is also classified by the OECD as particularly research-intensive, which is considered an indicator of a high level of technology.

China's importance in the electrical industry sectors is in line with the industrial strategy "Made in China 2025", announced in 2015. It aims to make China the leader in several technical sectors. However, it should be noted that China itself currently still imports many of the inputs in these sectors.

Figure 2 also shows that there are some sectors where the Chinese footprint is relatively small across both countries, such as Coke and refined petroleum products (ISIC 19) or Food products (ISIC 10-12). For Food products, one explanation for the lower share could be the trade barriers that exist for agricultural products to enter the European market.

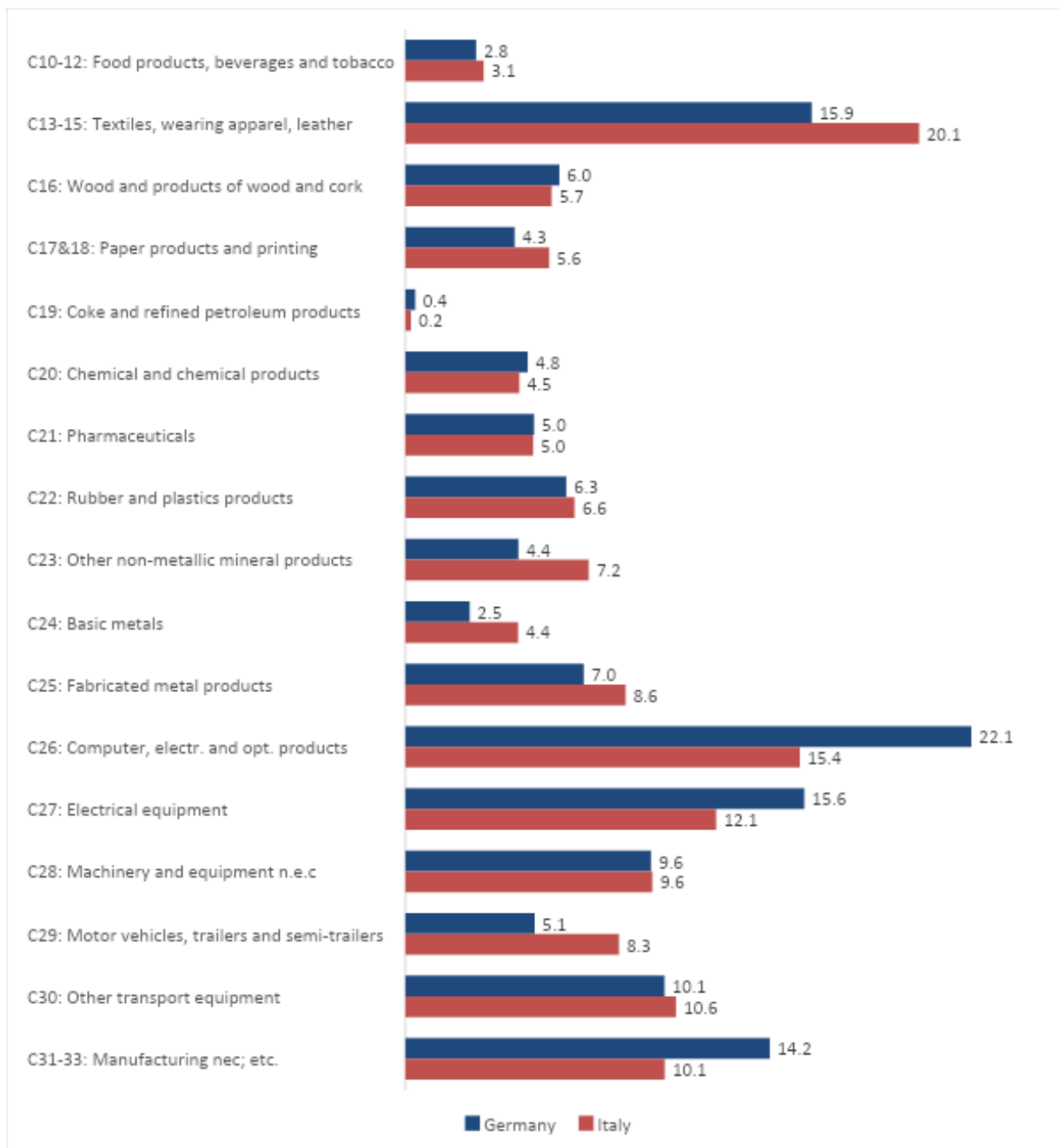
The relative pattern among industrial sectors stays more or less the same, albeit on a lower level, when accounting for domestic intermediate inputs. Computers, electrical and optical equipment (ISIC 26) is still the sector where Germany is most dependent on Chinese intermediate inputs. However, the share of Chinese inputs in all intermediate inputs more than halves to 8.5 percent when



also accounting for German intermediate inputs in that sector.

In Italy most intermediate inputs from China also still go into the sectors of Textiles, wearing apparel, and leather (ISIC 13-15). But the Chinese share only makes up 5.5 percent when the Italian intermediate inputs in that sector are also considered. When compared to the Chinese share of foreign intermediate inputs in that sector in Italy (20.1 percent), suggests that Italy uses relatively more domestic intermediate inputs in the textile sector.

Figure 2: Sectoral industry dependence on Chinese intermediate inputs as percent of foreign intermediate inputs (excluding domestic inputs) for Germany and Italy in 2019.



Sectoral classification according to ISIC Rev 4 (for better readability the names of some sectors are shortened)

Sources: OECD ICIO; German Economic Institute



Accounting for the relative economic importance of industrial sectors

With over 20 percent, both Italy and Germany display a considerable dependency on China for foreign intermediate inputs in some industrial sectors. In trying to evaluate whether a sectoral dependence on China at the intermediate input level is critical, one approach is to consider how much the respective sector accounts to the overall value added of a country. Figure 3 therefore plots the Chinese share of foreign intermediate inputs in 2019 (X-axis) against the share of overall value added in 2019 (Y-axis) for the different industrial sectors. Figure 4 shows the same relationship for Italy.

By comparing Figures 3 and 4, a first take-away is that the German industry accounts for a larger share of value added than in Italy (in total 22.1 percent in Germany versus 16.9 percent in Italy). This difference is mainly driven by the importance of the Motor vehicles, trailers and semi-trailers (ISIC 29) sector to the German economy with 4.5 percent of value added, while it accounts for only 0.9 percent of value added in Italy.

For Germany, some sectors with a relatively high share of overall value added, such as Motor vehicles, trailers and semi-trailers (ISIC 29) with 4.5 percent of value added, Chemical and chemical products (ISIC 21) and food products (ISIC 10-12), both with 1.6 percent of value added, have a below average industry dependence on China for their foreign intermediate inputs. Machinery and equipment n.e.c. (ISIC 28) is an exception, as it contributes 3.4 percent to overall value added and is also quite dependent on China for intermediate inputs.

However, in Germany the sectors that depend most on China for their intermediate inputs – Computer, electronic and optical products (ISIC 26) and in particular Textiles, wearing apparel, leather and related products (ISIC 13-15) – account for less to overall value added with 1.4 percent and 0.2 percent, respectively, than other sectors.

Similar to Germany, in Italy there are also a few sectors that account for a higher proportion of value added and that are also more dependent on China in terms of intermediate inputs. Examples are Machinery and equipment n.e.c. (ISIC 28) with 2.4 percent of overall value added, Fabricated metal products (ISIC 25) with 2.1 percent or Manufacturing n.e.c. (ISIC 31-33) with 1.5 percent of value added.

The relationship is particularly critical for Textiles, wearing apparel, leather and related products (ISIC 13-15) with the highest dependence on China for intermediate inputs and the fourth highest contribution to value added in Italy. It is noticeable that Italy lacks a sector that adds a lot to value added and at the same time has a low dependency on Chinese inputs – like the motor vehicles sector in Germany.



Figure 3: Share of Chinese foreign intermediate inputs in 2019 (X-axis) and share of value added in 2019 (Y-axis), **Germany**.

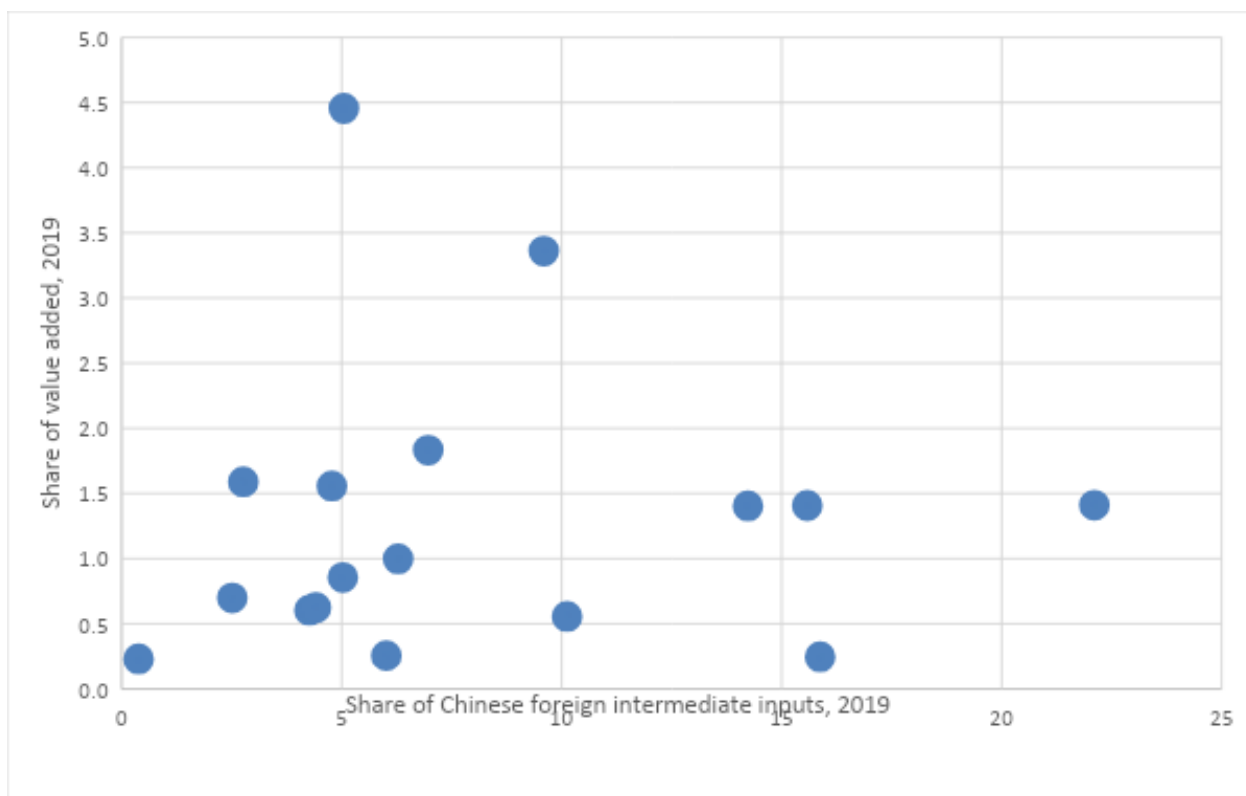
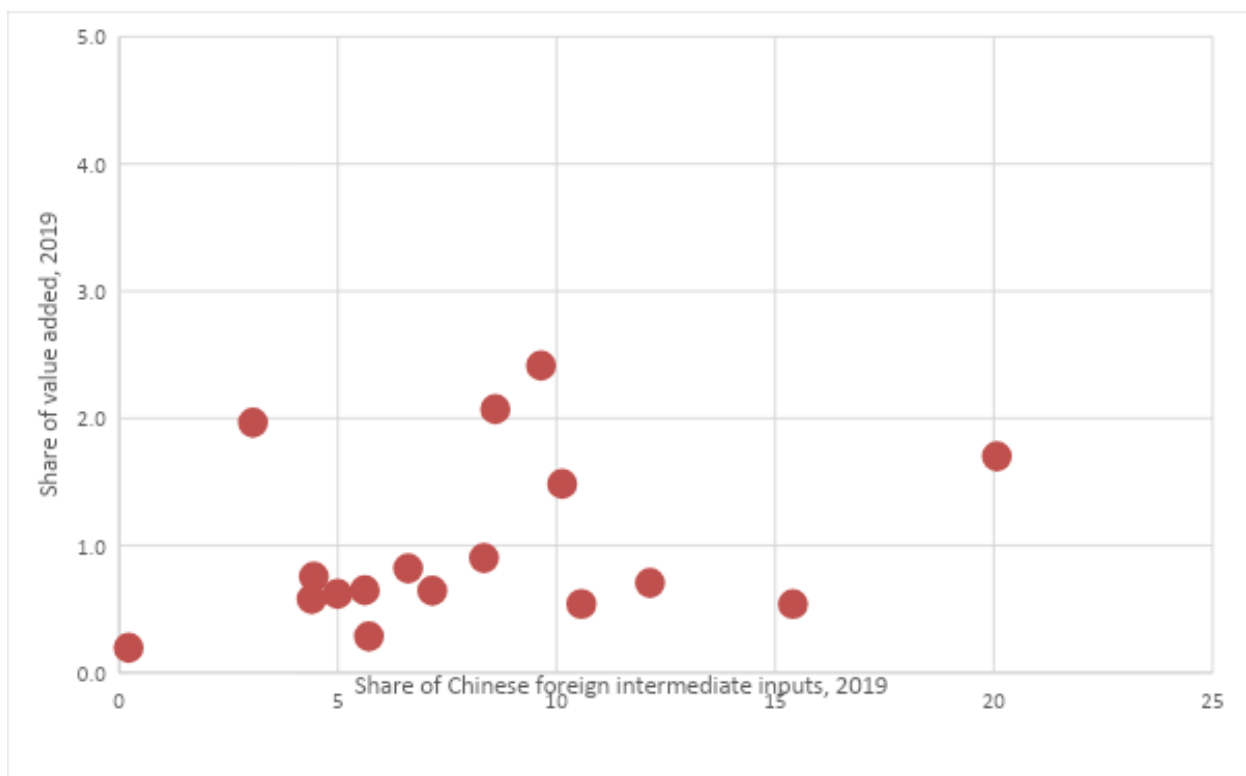


Figure 4: Share of Chinese foreign intermediate inputs in 2019 (X-axis) and share of value added in 2019 (Y-axis), **Italy**.



Sources: OECD ICIO; OECD TIVA; German Economic Institute



Conclusion

On average the German and Italian industry display a very similar intermediate input dependence on China, whether accounting for domestic inputs or not. Thus, the data does not prove the assumption that Germany is particular in that respect. With an industry average of around 7 percent of foreign intermediate inputs, the dependence on China also does not seem extraordinarily high for both countries.

The picture becomes more nuanced when focusing on the individual industrial sectors. In Germany, the share of Chinese intermediate inputs is highest in computer, electronic and optical products (ISIC 26) reaching around 22 percent of all foreign intermediate inputs.

Italy also obtains over 15 percent of its foreign intermediate inputs in that sector from China. However, Italy is most dependent on Chinese intermediate inputs for Textiles, wearing apparel, leather and related products (ISIC 13-15) with around 20 percent. This kind of dependence on Chinese intermediate inputs at the sectoral level warrants caution – particularly if it affects high-tech sectors, where China strives for strategic dominance.

Both Germany and Italy have several sectors that contribute significantly to value added and are also highly reliant on intermediate inputs from China. For instance, Machinery and equipment n.e.c (ISIC 28). However, while Germany has a sector – Motor vehicles, trailers and semi-trailers (ISIC 29) – that accounts substantially to value added and at the same time is less dependent on Chinese intermediate inputs, Italy lacks such a sector. In contrast, in Italy the sector that relies most on Chinese intermediate inputs – Wearing apparel, leather and related products (ISIC 13-15) – is also among those that account most to value added.

Thus, this Policy Brief emphasizes the importance of the ongoing discussion in the EU of diversification from China. This is best achieved in the short term by broadening trade relations with other countries as suppliers and customers for the German and the Italian industry, in order to reduce dependencies on China. It is therefore vital, that the EU gives greater priority to successful trade negotiations with countries in the Indo-Pacific region or Latin America.

