

German-Chinese Trade Relations: How Dependent is the German Economy on China?

Andreas Baur and Lisandra Flach (LMU Munich and ifo Institute)



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German-Chinese Trade Relations: How Dependent is the German Economy on China?^{1 2}

*Andreas Baur and Lisandra Flach**

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Abstract

In recent decades, China has risen to become Germany's most important trading partner for international trade in goods. Has Germany become too dependent from trade with China? An analysis using direct and indirect value-added linkages along the supply chain shows that China plays an important, but by no means dominant role for Germany as a supplier or destination market. However, in a survey conducted by the ifo Institute, 46% of German firms in the manufacturing sector state that they currently depend on important intermediate inputs from China. Of those, almost half of the firms are planning to reduce imports from China in the future. The most frequently mentioned reasons for reducing imports from China are the desire to decrease dependencies and increase diversification, increased freight costs and disruptions in transportation, as well as political uncertainty. An analysis at the product level shows that the German economy depends on several critical industrial goods and raw materials from China.

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Executive Summary

We investigate German-Chinese trade relations both at the aggregate and micro level. First, we evaluate Germany's supply chain linkages with China and the extent of mutual dependencies at the sector and product level. Second, we present the results of a representative survey conducted by the ifo Institute with over 4,000 German firms, which provide new insights into the role of Chinese inputs for the German economy.

Main results from the analysis using sector-level data:

- In 2020, China's share of global trade in goods stood at 13.1%, almost the double in comparison to Germany's share of global trade in goods (7.2%).
- China is Germany's largest trading partner for trade in goods and accounted in 2021 for **9.5% of Germany's trade in goods**. However, as a comparison, Germany's trade in goods with the four Visegrád countries in 2021 was almost 40% higher than the value of trade in goods with China, even though the four countries represent only 6.7% of China's gross domestic product (GDP) and 4.5% of China's total population.
- Traditional statistics on trade in goods are of limited use, as they do not consider the importance of trade in services and of direct and indirect supply chain linkages. Using OECD input-output tables, the analysis of direct and indirect supplier and demand linkages shows that China accounts for **7% of all foreign intermediate inputs in Germany's final production**. This number is considerable, but also significantly lower than the share of foreign intermediate inputs attributed to US value added (10%).
- Other **European Union (EU)** member states are the main suppliers of intermediate products and account for **44% of foreign value added** in the production of final goods in **Germany**.
- This shows that China plays an important but not a dominant role for Germany as a supplier. Also when it comes to the importance of China a sales market for German goods and services, a similar picture emerges. The EU single market, on the other hand, is of key relevance for Germany both for intermediate products and as a sales market.
- The **share of Chinese inputs in German final production** is comparable to the corresponding share in other European countries such as France or Spain and represents a rather below-average number compared with the other G-20 countries.
- As a destination market, China's importance for Germany is relatively high compared with the other European G-20 countries: **2.7% of total German value**

added depends on demand from China. By contrast, France exports only 1.7% of its domestic value added directly and indirectly to China, and Spain less than 1.2%. In comparison to other G-20 countries, Germany thus ranks roughly in the middle.

- **The EU is the most important supplier of intermediate inputs to China from a value-added perspective. China is fundamentally dependent** on foreign intermediate products and foreign demand originating in the EU, but the extent of these economic interdependencies has changed very significantly over the past 25 years.

Main results from the analysis using product-level data:

- Using product-level trade data, we define products with **critical dependencies** vis-à-vis China based on three criteria (cf. Flach et al, 2021). First, the relevance of the respective intermediate goods for production in Germany. Second, the degree of market concentration of suppliers, measured by the Herfindahl-Hirschman index. Third, the degree of substitutability of a good by domestic production.
- Only a small share of critical industrial products is imported from China. Across sectors, **the highest share of critical dependencies from China can be found in the chemical sector**: nearly 27% of imports of all critical industrial goods from China are chemical goods, followed by electrical equipment (21.4%) and transportation equipment (14%). Examples of critical industrial products are magnets, projectors, amino acids or heterocyclic compounds.
- The dependence on Chinese **raw materials** is in general much higher than on Chinese industrial products.
- The numbers indicate that an abrupt **decoupling from China** would be associated with major disruptions in specific supply chains and emphasize the importance of greater diversification in these sectors.

Main results from the firm-level survey with German firms:

- To obtain a better understanding of the importance of Chinese intermediate inputs for **German firms**, in February 2022 the ifo Institute directly surveyed approximately 4,000 firms about their import relationships with China. The representative survey includes manufacturing, wholesale and retail trade.
- Firms were asked whether they currently rely on key inputs from China. The results of the survey show that **46% of industrial firms** and over 40% of wholesalers and retailers rely on intermediate inputs from China.

- In the German manufacturing sector, **almost every second firm which receives significant inputs from China** plans to reduce its imports from China in the future. For wholesalers, this figure is only marginally smaller at around 44%, while for retailers it is well over 55%.
- Firms were also asked how they intend to replace the corresponding Chinese inputs in the future. **Four out of five manufacturing firms that intend to reduce imports of Chinese inputs in the future plan to purchase more inputs from other European countries in return.**
- When asked about the reasons for the planned reduction in imports from China, **79% of all firms cite the diversification of supply chains and the avoidance of dependencies.** Increased freight costs and the disruptions in transportation are also reasons for 66% and 54% of firms, respectively, to import less from China in the future. Finally, a third important motive for many firms' plans to reduce their imports from China is the currently prevailing political uncertainty: around 41% of German firms mention this as a reason for the reduction of imports from China in the future.

1 Introduction

In October 1972, almost fifty years ago, the Federal Republic of Germany and the People's Republic of China officially established diplomatic relations. Since then, China's role in the global economy has changed radically. China's rise has been associated with new sales opportunities for many German firms and with the possibility of offshoring production steps at low cost.

However, the excitement over the booming trade relations with China has increasingly given way to a certain disillusionment in Germany in recent years. The hope that China would increasingly develop into a Western-style democracy organized along market-economy lines has proved illusory, at the latest since Xi Jinping's presidency. Negative effects on the German and European economy are also increasingly being discussed, and human rights violations in China, such as in the Xinjiang region, are coming into focus, not least due to new legal requirements for monitoring international supply chains. In addition, the war in Ukraine and the associated sanctions against Russia also cast a new light on the geopolitical significance of economic interdependencies with China.

In this report, we investigate German-Chinese trade relations both at the aggregate and micro level. In a first step, we examine the extent of Germany's mutual economic dependencies vis-à-vis China, considering supply chain linkages and the role of critical goods and raw materials. We then present the results of a representative survey conducted by the ifo Institute with over 4,000 German firms, which provide new insights into the role of Chinese intermediate inputs for the German economy. Finally, we discuss possible implications for German foreign economic policy and highlight the importance of a cohesive and ambitious European trade policy in this context.

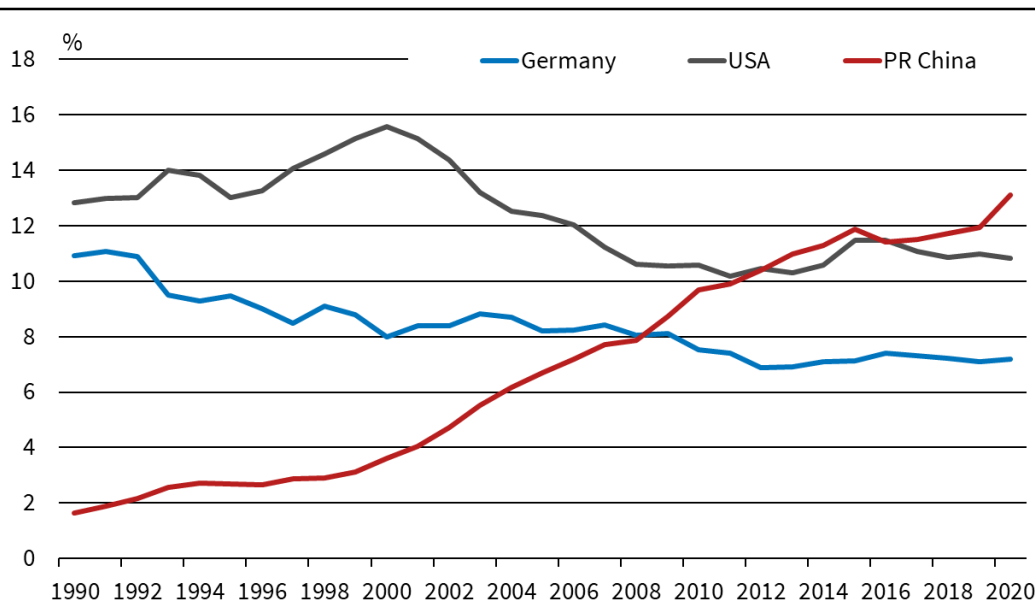
2 China's Rapid Rise to Become Germany's Most Important Trading Partner

Figure 1 shows the rise of China as a global player: especially since China joined the World Trade Organization (WTO) in 2001, China's share of global trade in goods has risen continuously, surpassing Germany's share as early as 2008. In 2012, China also overtook the United States and thus had the largest trade volume of any country in the world for the first time. In 2020, China's share of global trade in goods finally stood at 13.1%, almost doubling Germany's share of 7.2%. China's remarkable rise in international trade is also reflected in German trade statistics (Figure 2). In 1990, China accounted for less than one percent of Germany's trade in goods, but by 2021 this figure

had risen to 9.5%. China is thus Germany's largest trading partner in goods, ahead of the Netherlands (8.0%) and the United States (7.5%), with foreign trade revenue of 245.4 billion euros. At the same time, Germany's trade balance with China also shows the largest trade deficit: in 2021, the value of German imports from China exceeded the value of German exports to China by 38.2 billion euros.

Figure 1

Share in global goods trade



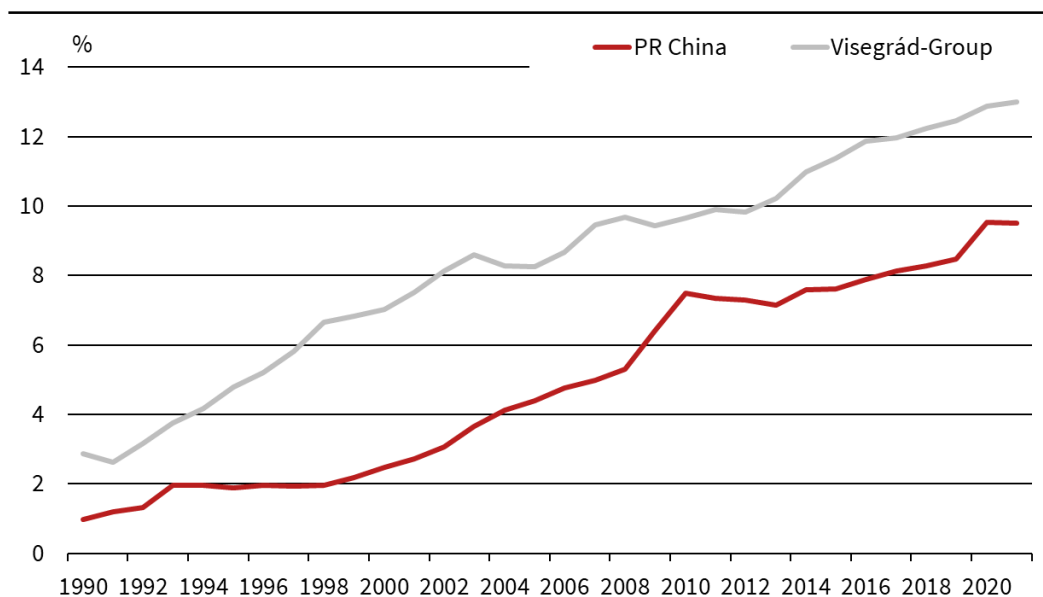
Source: UNCTAD, own calculations and illustration.

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From the perspective of the German economy, China's rise to become the most important trading partner for trade in goods is undoubtedly impressive, but at the same time its significance should not be overestimated. For example, if we look at German trade in goods with the four Visegrád countries (Poland, the Czech Republic, Slovakia and Hungary), it has shown a comparable momentum since the fall of the Iron Curtain (see Figure 2) and has grown even faster in comparison to China over the past ten years (Visegrád Group: + 72%, China: + 69%). In fact, the value of Germany's trade in goods with the Visegrád countries in 2021 was almost 40% higher than the value of trade in goods with China, and this despite the fact that these four states together represent only 6.7% of China's gross domestic product (GDP) and 4.5% of China's total population.

Figure 2

Share in German goods trade



Source: Federal Statistical Office of Germany, own calculations and illustration.

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3 Trade with China from a Value-Added Perspective: Supply Chain Linkages

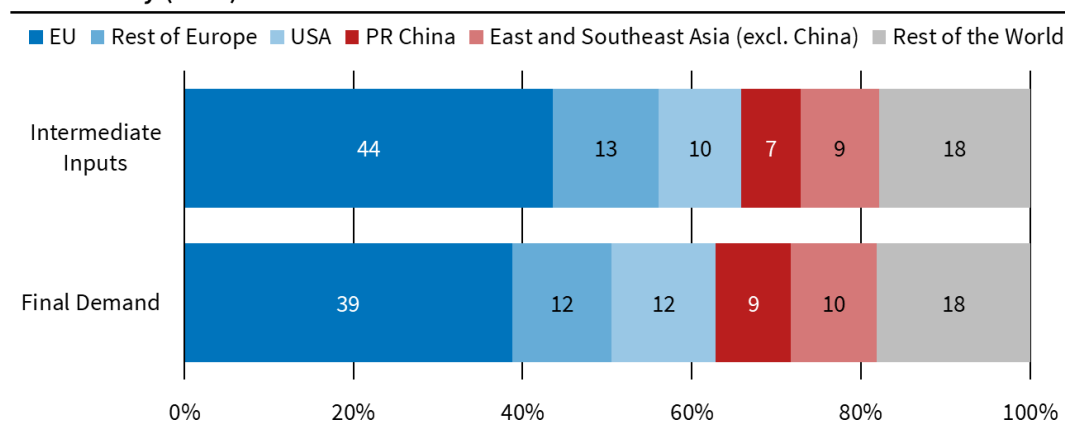
However, to assess the importance of China for the German economy, traditional statistics on trade in goods are only of limited use. First, they do not take into account the importance of trade in services (see Braml and Felbermayr, 2021). Second, they cannot adequately depict global value chains and the resulting direct and indirect interdependencies: if, for example, a Chinese intermediate input is processed into an intermediate product in Poland before it is used in final production in Germany, only the direct link between Germany and Poland is recorded in the trade in goods statistics. By contrast, the Chinese value added, which also went into the production of the German final product, is not recorded. The same applies to German intermediate products that are exported to Slovakia, for example, processed there into consumer goods and ultimately purchased by Chinese consumers. In this case, German trade statistics will also not capture the fact that German value added was ultimately exported to China.

For this reason, this section analyzes economic interdependencies between Germany and China using inter-country input-output tables published by the OECD for the years 1995 to 2018. They capture both direct and indirect supplier and demand structures on a value-added basis and cover all sectors of the economy (including services). Thereby,

they allow for a more accurate analysis regarding value-added linkages between individual countries and the resulting interdependencies.

Figure 3

Geographical distribution of foreign intermediate inputs and foreign final demand for Germany (2018)



Note: »Rest of Europe« includes the UK, Switzerland, Norway, Turkey and Iceland.

»East and Southeast Asia« includes Japan, South Korea, Taiwan and ASEAN member states.

Source: OECD ICIO 2021; own calculations.

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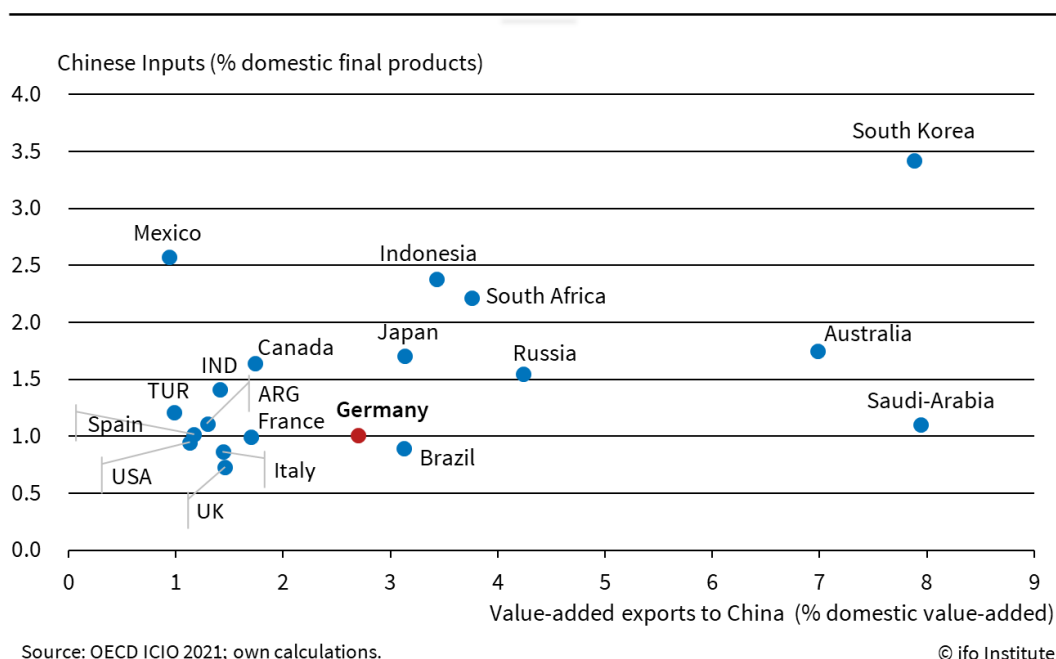
Figure 3 shows the role of China as a supplier of intermediate inputs and as a sales market for Germany compared with other German trading partners, taking into account all sectors of the economy as well as direct and indirect value-added linkages. As a supplier, China accounts for 7% of all foreign intermediate inputs in German final production. This number is considerable, but also significantly lower than the share of foreign intermediate inputs attributed to US value added (10%). However, the main suppliers for Germany are clearly other EU member states, which provide 44% of foreign value added for the production of final products in Germany. A similar picture emerges for the distribution of foreign final demand on a value-added basis: foreign demand for German value added is strongly regional in nature, with European countries accounting for more than 50%. China accounts for 9% of German value-added exports, and the US for 12%. This shows that China plays an important role for Germany both as a supplier and as a sales market from an overall economic perspective, but by no means a dominant role compared with other trading partners. The EU internal market, on the other hand, is of key relevance for Germany both for intermediate products and as a sales market.

How large are Germany's value-added linkages with China compared with the linkages of other countries with China? Figure 4 shows China's role as a supplier (vertical dimension) and as a sales market (horizontal dimension) for the G20 member countries. Since these countries are integrated to different degrees in the global economy, the share of Chinese value added in domestic final output and the share of Chinese final demand for domestic value added do not refer exclusively to the foreign component, as in the previous figure. The share of Chinese inputs in German final products is around 1% overall,

which is comparable to the corresponding share in other European countries such as France or Spain and represents a rather below-average value compared to the other G20 countries. By contrast, the countries with the greatest overall economic dependence on Chinese intermediate inputs are South Korea, Mexico, and Indonesia, whose products contain more than 2% of Chinese value added on average. As a sales market, China's importance for Germany is relatively high compared with the other European G20 countries: 2.7% of total German value added depends on demand from China. By contrast, France exports only 1.7% of its domestic value added directly and indirectly to the People's Republic, and Spain less than 1.2%. In the context of the G20, Germany ranks roughly in the middle. The share of value added induced by Chinese demand is significantly higher for South Korea, Saudi Arabia, and Australia (between 7% and 8%) while for Mexico and Turkey less than 1% of domestic value added is linked to demand from China.

Figure 4

Economic dependence of G20 countries vis-a-vis China



The economic dependence of Germany and other countries on China is not a one-way street, because China is also fundamentally dependent on foreign intermediate products and foreign demand. But the extent of these economic interdependencies has changed very significantly over the past 25 years, as shown in figures 5 and 6. Figure 5 shows the role of Chinese inputs for production in Germany, the EU (as a whole), the US, and Japan since 1995. A clear upward trend can be seen for these Western economies, interrupted only briefly by the global financial crisis in 2009. The importance of Chinese

value added for domestic production has been at a similar level over time for Germany, the EU and the US, standing at around 1% in 2018. Only Japan exhibits significantly higher values over the years (2018: 1.7%). Figure 5 compares this development with the corresponding significance of German, European, US and Japanese intermediate inputs for the Chinese economy. On the one hand, this shows that China relied heavily on intermediate inputs from the EU especially between 2000 and 2008. In the wake of the financial crisis, however, the share of European inputs in Chinese final products has fallen again, leveling off at around 1.5%. This makes the EU the most important supplier of intermediate inputs for China in 2018. A similar temporal trend emerges for Germany, although since the financial crisis German inputs have been less important for China in macroeconomic terms than Chinese inputs have been for Germany. The role of the United States as a supplier of intermediate inputs to China has fallen somewhat since 1995, and in 2018 was roughly similar to the role of Chinese inputs to the United States. Japanese inputs, on the other hand, have become significantly less important to the Chinese economy since the mid-2000s, causing Japan to lose its role as China's most important supplier country.

Figure 5

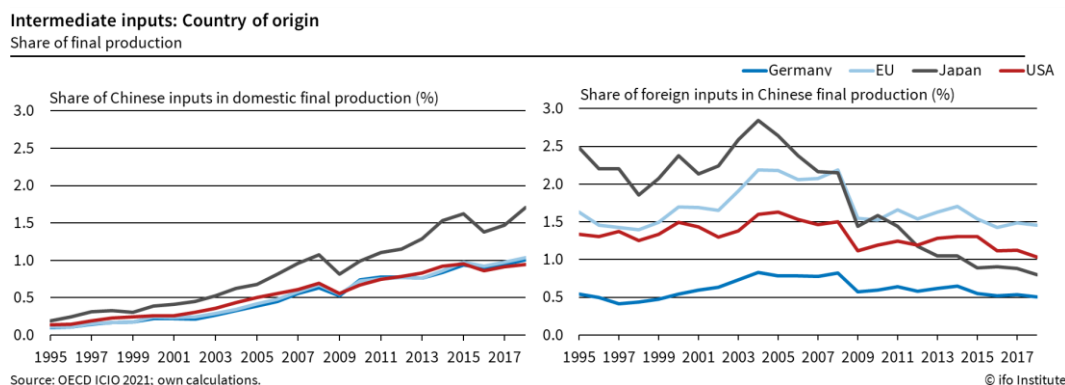
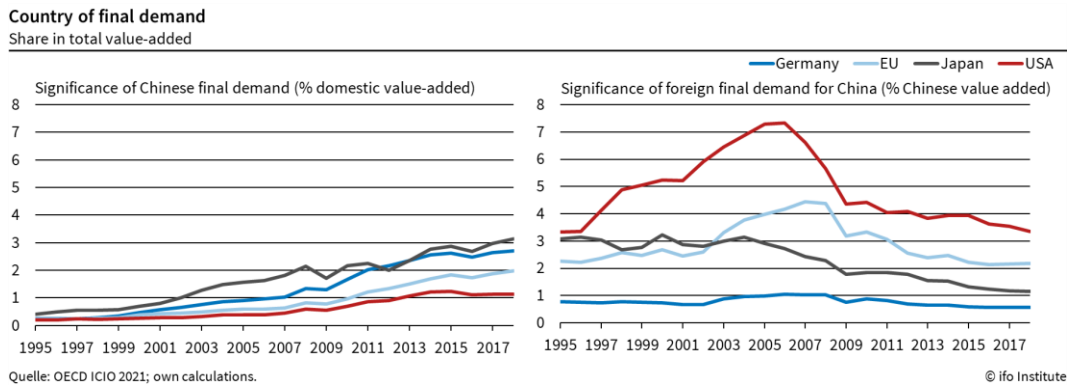


Figure 6 shows that the importance of China as a sales market for all four economies has also increased significantly since 1995, with Germany being more dependent on Chinese demand than the EU as a whole. If we look at the share of Chinese value added exported to Germany (right-hand chart), there is a clear asymmetry, similar to the one with respect to intermediate inputs: China is significantly more important as a sales market for Germany than German final demand for China. For the EU, on the other hand, the reciprocal importance as a sales market is currently almost symmetrical in relation to China and amounts to around 2% of total value added in each case. Overall, it is striking that the Chinese economy has become significantly less dependent on demand from the EU, Japan and the United States since the mid-2000s. Nevertheless, the United States remained by far the most important foreign sales market for China in 2018, with over 3.5% of total Chinese value added being exported to the US. By contrast,

China played a much smaller role as a sales market for the United States, with a share of around 1%.

Figure 6



Overall, a nuanced picture emerges of Germany’s value-added links with China. China’s importance for Germany has grown significantly over the last thirty years, both as a supplier of intermediate inputs and as a sales market. Overall, however, Germany’s direct and indirect value-added links are still primarily European in character, and China has not (yet) surpassed the economic importance of the United States for Germany. In a European comparison, it is noticeable that the German economy is significantly more dependent on Chinese demand than the economies of other EU member states, but this is put into perspective when compared with other G-20 countries. From a Chinese perspective, Germany does not play a predominant role as a supplier and sales market, which is why a certain asymmetry has developed in the macroeconomic linkages between the two countries in recent years. When looking at the EU as a whole, on the other hand, a different picture emerges: for China, the EU is the most important supplier and the second most important sales market, albeit with a declining trend since the global financial crisis. Thus, there is a relatively balanced economic relationship between the EU and China from a macroeconomic perspective for now.

4 Dependencies on Critical Products and Raw Materials

Cross-country input-output tables allow economic interdependencies between individual countries and sectors to be examined more closely from a macro perspective. However, dependencies on specific products and raw materials cannot be captured in this way. The Corona pandemic has shown that in particular shortages of specific inputs can lead to major disruptions in the entire supply chain. This is especially problematic when

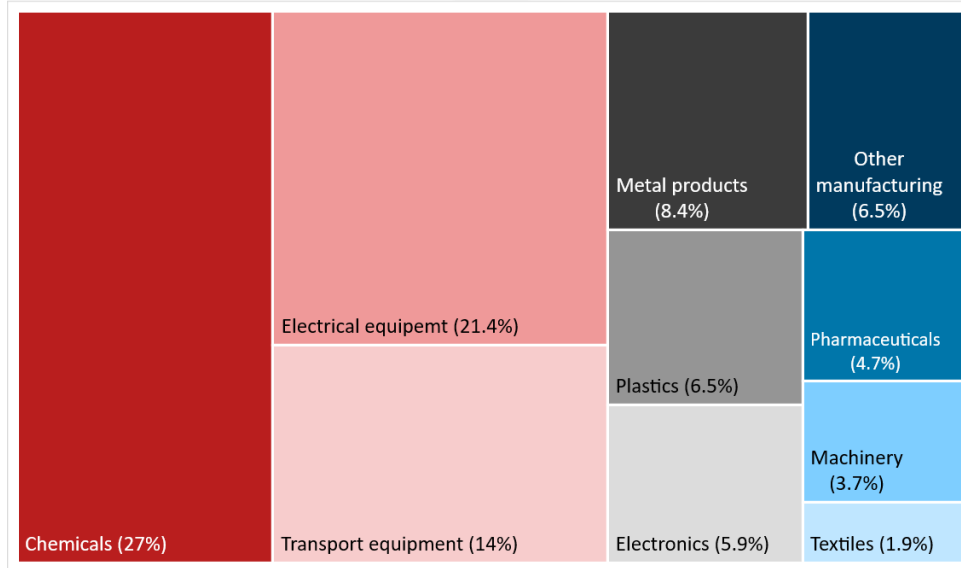
the country is highly dependent on only a few suppliers. Therefore, an analysis of dependencies at the product level is of great importance in order to identify and, if necessary, minimize the risk of supply chain disruptions. For this reason, the following section presents and evaluates product dependencies on China for individual industrial goods and critical raw materials from a German or European perspective.

In the following, we define products with critical dependencies vis-à-vis China on the basis of three criteria (cf. Flach et al, 2021). The first criterion is the relevance of the respective goods for German production. Only in the case of goods that are actually relevant for German production does a supply shortfall represent a high risk for the economy as a whole. The second criterion is the degree of market concentration in terms of supplier countries, measured by the Herfindahl-Hirschman index: a low degree of diversification in terms of suppliers is associated with a higher risk of supply failure in the event of negative shocks. In addition, the substitutability of a good by domestic production is also taken into account. For products that can be substituted by domestic production, there is less dependence on foreign countries.

Germany is most dependent on other EU member states for critical industrial goods. Almost three quarters of critical industrial products come from other EU countries, while 3% of critical products are imported from China and 7% from the US. Figure 7 shows that the highest dependencies on China are in the chemical sector: nearly 27% of imports of all critical industrial goods from China are chemical goods, followed by electrical equipment (21.4%) and transportation equipment (14%). Examples of critical industrial products are magnets, projectors, amino acids or heterocyclic compounds, which are important inputs for the production of active pharmaceutical ingredients.

Figure 7

Sectoral distribution of critical manufacturing goods from China



Source: Flach et al. (2021).

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Overall, goods with critical dependencies account for only 5% of all German imports across all trading partners. Nevertheless, even a small number of products can have a massive impact on the entire supply chain.

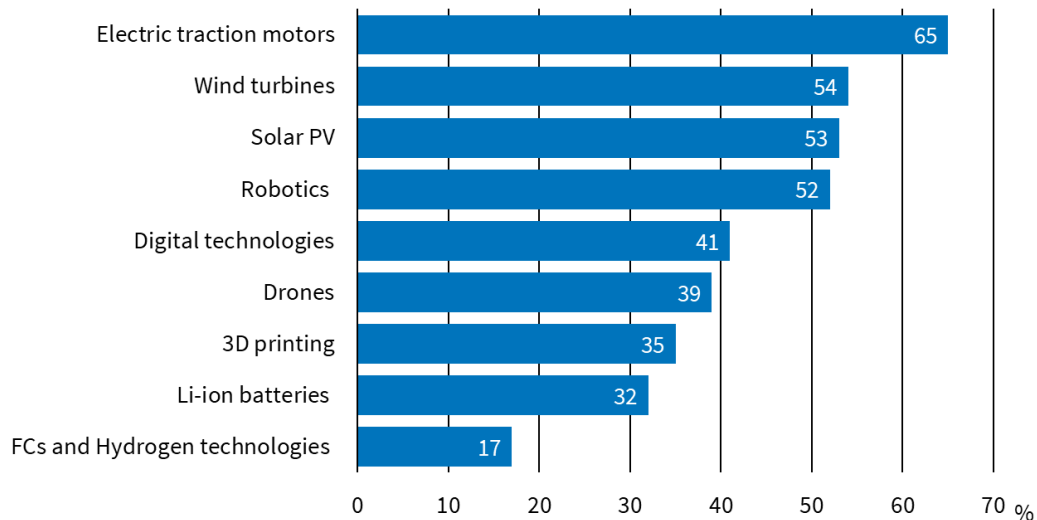
The dependence on Chinese raw materials is in many cases even higher than for industrial products. Figure 8 shows the proportion of raw materials imported from China that are used as inputs for nine strategic technologies in the EU. As can be seen in this figure, 65% of the raw materials for electric motors, for example, about are imported from China. In the case of rare earths, China's dominance of world markets also leads to cluster risks in the value chain. In particular, the rare earths contained in permanent magnets, such as dysprosium, neodymium and praseodymium, are essential for the construction of motors for electric vehicles and wind generators. For these three raw materials (dysprosium, neodymium and praseodymium), the supply risk value is the highest of all raw materials assessed in the EU Commission's Critical Raw Material Report in 2020, with a 100% EU import dependence and a high concentration of supply. In addition, wind turbines and other engines are also dependent on these raw materials.

Another example of critical dependencies is raw materials and components for the production of photovoltaic (PV) technologies: Here, China is not only the leader in raw material supply for the EU (with almost 53%), but also in the supply of processed materials and other components of the PV solar technology supply chain. The EU's share is estimated at a maximum of 6% for raw materials and 5% for processed materials, while

European capacities for the production of solar cells and modules are almost completely non-existent (EU Commission, 2020).

Figure 8

Share of imported raw materials from China needed for the production of strategic technologies in the EU



Source: European Commission, “Critical materials for strategic technologies and sectors in the EU - a foresight study”, 2020.

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These figures make it clear that an abrupt decoupling from China would be associated with major disruptions in specific supply chains and underscore the need for greater diversification in these areas. The biggest challenge for Germany and Europe is to diversify sourcing countries for raw materials, which is much harder to do than for final products. Here, free trade agreements with developing countries offer the best opportunity to promote trade with additional partner countries and to help firms diversify their supply chains. A European circular economy with improved resource efficiency also has an important role to play in this context.

5 How Do German Firms Assess Their Supply Chains with China?

Disaggregated trade statistics and cross-country input-output tables can provide insights into individual critical goods and commodities at the country and sector level and allow for statements about macroeconomic interdependencies between individual countries. However, global value chains emerge through concrete actions at the firm

How Do German Firms Assess Their Supply Chains with China?

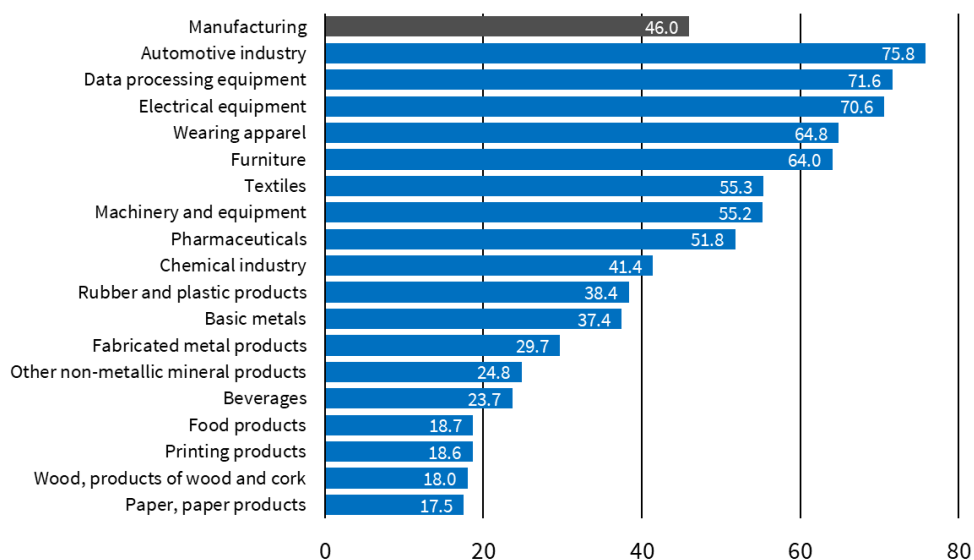
level, and this is where interdependencies or bottlenecks can arise that are not necessarily reflected in trade statistics. Therefore, in order to gain a better understanding of the current and future importance of Chinese intermediate inputs and goods for German firms, the ifo Institute directly surveyed approximately 4,000 firms about their import relationships with China as part of a representative survey conducted in the February 2022 Business Survey. The representative survey includes firms in manufacturing, wholesale and retail trade.

At the outset, all firms were asked whether they currently rely on key inputs from China. The results of the survey show that 46% of industrial firms and over 40% of wholesalers and retailers rely on intermediate inputs from China. However, these figures vary widely between industries: the share of firms relying on intermediate inputs from China is highest in the automotive, data processing equipment and electrical equipment industries (see Figure 9). In principle, these are also industries that rely heavily on international supply chains and whose supply chains are often globally oriented.

Figure 9

Import of significant inputs from China

Share of firms in %



Source: ifo Business Survey, February 2022.

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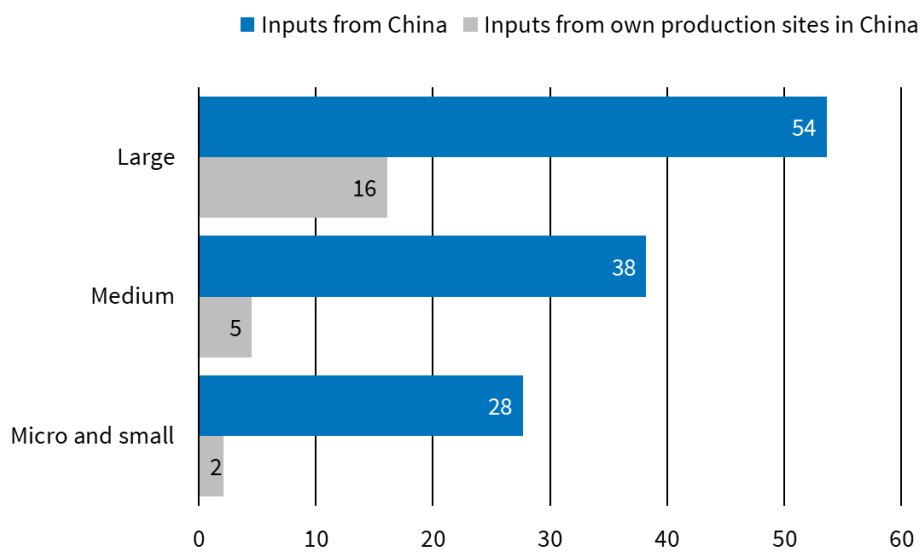
If firms rely on intermediate inputs from China, they were also asked whether they receive intermediate inputs from Chinese manufacturers or from their own production facilities in China. On average, 11% of German manufacturing firms rely on intermediate inputs from their own production sites in China. The strong variation by company size is interesting (see Figure 10). 54% of large firms in the manufacturing sector rely on intermediate inputs from China; 16% receive significant inputs from their own production

facilities in China. This figure is significantly lower for small and medium-sized enterprises, which is not surprising: large firms are more integrated into the global economy through both trade linkages and foreign direct investment. From this perspective, it is somewhat surprising that 28% of small firms state that they depend on Chinese intermediate inputs. It could well be the case here that some small firms are indirectly dependent on inputs from China via intermediaries.

Figure 10

Size class of enterprises

Import of significant inputs from China (share in %)



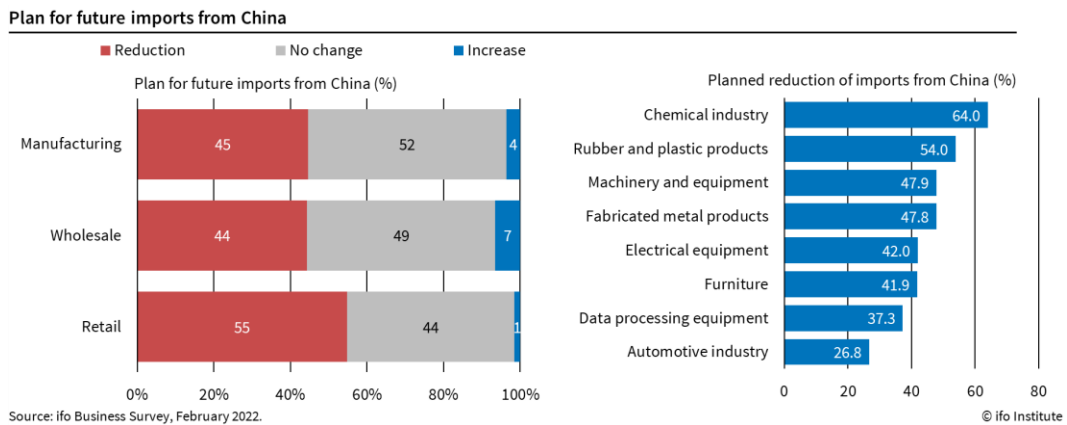
Source: ifo Business Survey, February 2022.

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All in all, Chinese imports currently seem to play an important role for very many German firms. But what is the future import strategy of firms that rely on Chinese intermediate inputs? In the manufacturing sector, almost every second company states that it intends to reduce its imports from China in the future (see Figure 11, left chart). For wholesalers, this figure is only marginally smaller at around 44%, while for retailers it is well over 55%. In contrast, increasing imports from China is only an option for a very small number of German firms: in the manufacturing sector, for example, only 4% of the firms surveyed said that this was the case. These survey results indicate that many German firms have started to rethink the role of Chinese inputs and goods deliveries and are reconsidering existing supply chains to China. However, this result also exhibits major industry-specific differences (see Figure 11, right-hand diagram): while almost two-thirds of all firms in the chemical industry want to reduce their imports from China, the automotive sector tends to rely more on the status quo. Here, only one out of four firms plans to reduce its purchases of inputs from China (27%), while the vast majority (68%)

is not planning any changes. Similarly, only around 37% of manufacturers of data processing equipment (as well as electronic and optical products) plan to reduce Chinese imports, while also only 2% of firms in this industry intend to increase their Chinese imports in the future.

Figure 11

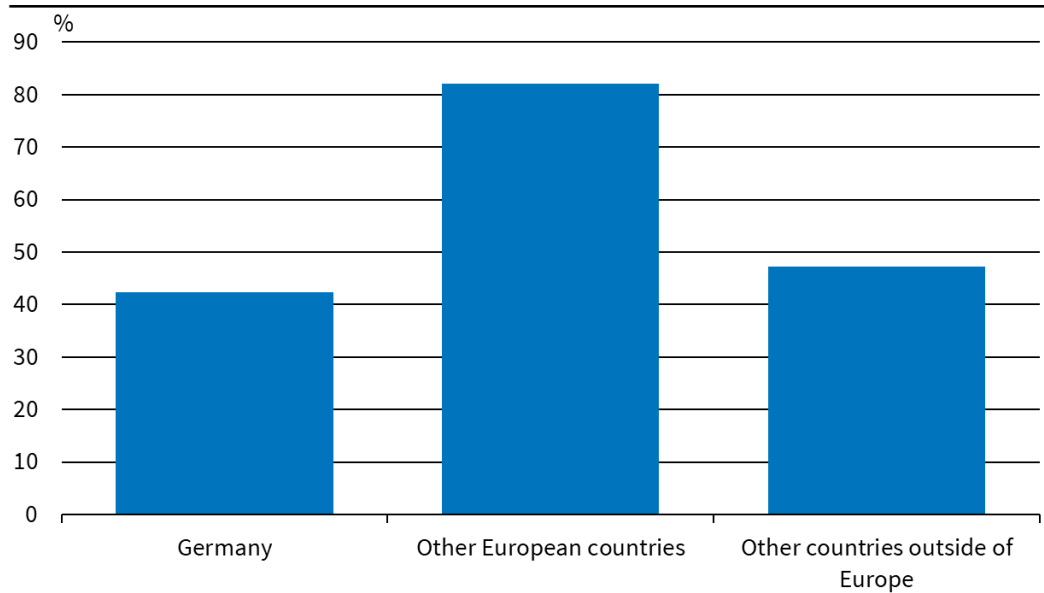


The firms which plan to reduce their purchases of Chinese inputs also indicated in the course of the survey how they intend to replace the corresponding Chinese inputs in the future. The survey results show that many are relying on European alternatives (see Figure 12). Four out of five manufacturing firms, that intend to reduce imports of Chinese inputs in the future, plan to purchase more inputs from other European countries in return (multiple answers were possible). Almost 50% of all firms plan to rely more on intermediate inputs from non-European countries as part of a reduction in Chinese imports, indicating a certain popularity of a “China+1” strategy. Around 40% of the firms, which want to reduce imports from China, are planning to increase sourcing of intermediate inputs from German suppliers. However, most of these firms also stated that, in addition to German inputs, they also wanted to intensify European and possibly non-European supplier relationships. By contrast, only less than 8% are relying exclusively on sourcing more inputs in Germany.

Figure 12

Planned reduction of imports from China, instead imports from...

Manufacturing, multiple answers possible



Source: ifo Business Survey, February 2022.

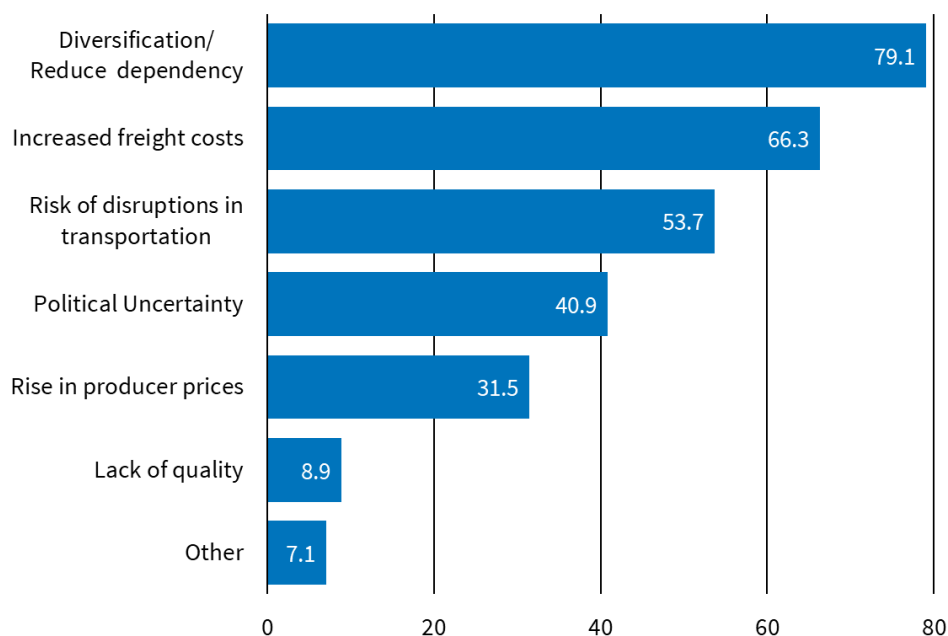
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These results already partly foreshadow the most important motives for many German firms to reduce their purchases of Chinese inputs. When asked about the reasons for the planned reduction of Chinese imports, 79% of all firms cite the desire to diversify supply chains and to reduce their dependency on China (see Figure 13). Increased freight costs and the risk of disruptions in transportation are reasons for 66% and 54% of firms, respectively, to purchase fewer Chinese inputs in the future. In comparison, increased producer prices (32%) or poor quality (9%) play a rather subordinate role. Finally, a third important motive for many firms' plans to reduce their imports from China is political uncertainty; around 41% of German firms cite this as a reason for their corresponding procurement plans.

Figure 13

Reasons for planned reduction of imports from China

Manufacturing sector, multiple answers possible (share in %)



Source: ifo Business Survey, February 2022.

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6 Conclusion and Outlook

China has become Germany’s most important trading partner for trade in goods. Results from the ifo survey from February 2022 reveal that almost half of German manufacturing firms are reliant on Chinese intermediate inputs. However, the survey results also show that many firms in Germany are currently rethinking their supply chains with China. Almost every second firm that currently relies on significant Chinese inputs plan to reduce imports from China in the future. Most of them aim to increase imports from other European and non-European countries, suggesting a “China+1” strategy. The main reasons for reducing imports from China are the desire to decrease dependencies and increase diversification, the increased freight costs and disruptions in transportation, as well as political uncertainty. Three important implications arise from these facts for German and European foreign trade policy.

First, it is becoming clear that, at the latest with the outbreak of the Corona pandemic and the associated supply chain disruptions, the diversification of supply chains has become an important strategic goal for many German companies (see also Baur and Flach, 2022a). Almost 80% of companies cite this as a reason for their planned reduction

of inputs from China. Not least due to growing geopolitical tensions, the diversification of supply chains is also a key element from an economic perspective in order to be more robustly positioned against country-specific shocks (Arriola et al., 2020; Caselli et al. 2020). Goods with critical dependencies account for only 5% of all German imports. Nevertheless, supply chain shortages of few products or raw materials can already have a massive impact on the supply chain. Especially in the case of raw materials, diversification of sourcing countries is a major challenge for Germany and the EU. In order to provide effective political support for the diversification efforts of German firms, it is essential to develop an ambitious German and European trade policy. Against this backdrop, it would be desirable for the German government to put priority on the prompt ratification of the trade agreement with the Mercosur member countries and the modernized trade agreement with Mexico at the EU level. High political priority should also be given to ongoing EU negotiations on bilateral trade agreements (such as with Australia) to enable improved market access for as many European companies as possible and thus facilitate the diversification of supply chains. Moreover, several EU FTA negotiations with major economies such as India or Malaysia have come to a de facto standstill in recent years. There is much to suggest that now is the right time to restart these negotiations.

Second, the fact that more than half of all manufacturing firms cite increased freight costs and the risk of disruptions in transportation as the reason why they want to reduce their purchases of intermediate inputs from China shows the important role of transport costs for internationally active companies, which should not be underestimated. European policy can also play an active role in this area. A positive example of this is the EU's "Global Gateway" initiative, which could make an important contribution to more resilient transport networks by promoting global infrastructure projects. Moreover, a more rigorous competition policy at the EU level with respect to the container shipping industry could also contribute to reduced freight costs. In this industry, market concentration has been increasing for years due to the merger of worldwide leading shipping companies in the form of global alliances and supposedly plays an important role for the strong increase in container freight costs (Merk and Teodoro 2022, Baur et al. 2021).

Third, given geopolitical tensions, it is not surprising that political uncertainty is an important reason for almost 41% of German manufacturing firms to reduce their purchases of Chinese intermediate inputs. In the recent past, the Chinese government has already demonstrated several times that it is willing to use bilateral trade relations for its geopolitical goals, implying that it would be naïve to ignore the geopolitical significance of economic interdependencies with China. However, the increasing calls in Germany for a complete "decoupling" from China are also short-sighted in the sense that they not only ignore the potentially large economic welfare losses but also the multi-

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layered role of economic interdependencies. It is true that far-reaching economic linkages tend to lead to greater negative impacts in the event of conflict. However, because of their importance, they tend to reduce the incentive to use economic relations to achieve geopolitical goals and may thus reduce the likelihood of conflict. Because of this ambiguity of economic interdependencies, the goal of German and European foreign economic policy should not be decoupling from China, but primarily the avoidance of one-sided dependencies. The prerequisite for this is a united and self-confident European stance towards China: the EU as a whole is the most important supplier of intermediate inputs and the second most important sales market for China from a value-added perspective, which should in principle enable the EU to take a clear and self-determined stance towards China. Moreover, a much stronger focus should be placed on critical goods and raw materials where the EU is more dependent on China. In this area diversification efforts at the European level must be intensified as quickly as possible.

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