Navigating supply chain disruptions

New insights into the resilience and transformation of EU firms

European Investment Bank

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About the Economics Department
The mission of the EIB Economics Department is to provide economic analyses and studies to support the Bank in its operations and in the definition of its positioning, strategy and policy. The department and its team of economists is headed by Debora Revoltella, director of economics.

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Foreword

In recent decades, the European Union (EU) has benefitted greatly from its deep integration into global value chains. Trade openess, the delocalisation of production, and low energy costs have been constant contributors to the economic model, allowing European firms to prosper.

However, recent crises – the pandemic, shortages of strategic inputs, rising shipping costs and disrupted routes, the energy crisis and increased geopolitical tensions – have highlighted a number of vulnerabilities and single points of failure in global supply chains. Supply chain integration also suffers from strategic dependencies on critical products and inputs for Europe.

Against a fast-changing global landscape marked by persistent disruptions and heightened, systemic uncertainty, the nexus between trade, economic security and competitiveness increasingly occupies centre stage in EU policy. This is why it is essential to better understand how businesses address supply chain distress, and which strategies they are now setting in motion to bolster resilience.

In making this report, the European Investment Bank (EIB) and the European Commission's Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW) teamed up to gather new evidence and lend insight into these critical issues. The report presents a groundbreaking survey on the supply chains of EU firms. It leverages on the 2023 run of the new Supply Chain Survey (SUCH) and the 2023 EIB Investment Survey (EIBIS), laying out firms' reactions to the first trade shocks and offering key strategic insights to inform policymakers, businesses and stakeholders at large.

The report explores the factors that help firms transform their activities to boost their resilience to shocks – highlighting, for example, the critical role played by investments in areas like innovation and digitalisation. The findings also confirm the importance of diversification, access to finance and predictable regulatory frameworks. This knowledge is especially useful in designing policies that let businesses overcome short-term distress, but that also foster economic security, sustainable growth and competitiveness in the long term.

The EIB Group supports significant investments in projects related to the decarbonisation of industry, electrification, digitalisation and manufacturing, with a particular emphasis on innovation and critical raw material supply chains. The European Commission supports the growth, long-term competitiveness and resilience of EU firms and the EU economy as a whole. We support European industries across different industrial ecosystems to strengthen their leadership, by helping to leverage the power of the single market and drive Europe's transformation to a more sustainable, resilient and globally competitive economy. As part of its Supply Chain Intelligence Hub, the Commission's DG GROW has pioneered a state-of-the-art methodology to map the EU's strategic dependencies across industrial ecosystems, created an early warning system to monitor distress in supply chains (SCAN), and is evaluating shifting patterns in supply chain dynamics.

We look forward to continued collaboration to support European policy initiatives to de-risk EU supply chains and strengthen the resilience and competitiveness of EU firms.

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Introduction

Over the past decades, Europe has become deeply integrated into world trade and global production networks. The European Union (EU) is the second largest economy in the world and the largest trader of manufactured goods and services. If properly managed, the expansion of trade can be a driver of economic prosperity. By increasing opportunities for specialisation and investment, international trade can foster job creation, increase the variety and decrease the prices of goods and services, and raise productivity in Europe.

However, recent crises, such as trade tensions between the United States (US) and China, the COVID-19 pandemic, shortages of key strategic inputs, rising shipping costs, the Russian military aggression against Ukraine and the energy crisis, have brought new challenges. These disruptions have uncovered vulnerabilities in global supply chains and EU strategic dependencies in imports, in a context of rising geopolitical tensions that have left the global economy in a heightened state of uncertainty – in a new "age of disorder." Disruptions in logistics and transport and restricted access to commodities and raw materials (steel, copper, fossil fuels, raw materials, etc.), semiconductors and other components have become major obstacles to the operations of EU firms.

As multiple disruptions compound the pressure on EU firms, there is an urgent need to build robust strategies to manage trade risks and increase resilience – while preserving, to the greatest extent possible, economic efficiency. But striking the right balance between reducing vulnerabilities and maintaining efficiency is not straightforward. It requires a nuanced understanding of how EU firms are affected by supply chain tensions and the factors that hinder or support firms' capacity to de-risk supply chains and increase resilience. This will help inform the policy debates on industrial policies that have emerged in the EU.

European policymakers are responding to these challenges by helping firms reduce dependencies, build on the strength of the EU single market and rely on Europe's resources in key strategic areas, while also maintaining strong ties and cooperation with other countries and global partners – a concept known as open strategic autonomy. In addition, a three-pillar approach to EU economic security has been put in place by promoting the EU's competitiveness, protecting against risks and partnering with the broadest possible range of countries to advance shared economic security interests. This policy intervention will create incentives for firms to diversify and build resilience to trade disruptions, in a context of increasing global uncertainty and market frictions. In an era when the competitiveness of Europe could be at risk, the EU remains steadfast in its commitment to preserving the advantages of trade integration while simultaneously promoting diversification, resilience and innovation within the single market.

The EU has adopted various policy measures to reduce strategic dependencies, under the umbrella of policies in support of its open strategic autonomy. For instance, the Critical Raw Materials Act will enhance the EU's access to a secure, diverse and sustainable supply of key raw materials, while also boosting its ability to extract, process and recycle them. Critical raw materials are indispensable for the EU economy and technologies in strategic sectors such as renewable energy, digital, aerospace and defence.

The European Chips Act will address semiconductor shortages and strengthen Europe's technological leadership. Chips are strategic assets for key industrial value chains. The act will build and reinforce the capacity to innovate in the design, manufacturing process and packaging of advanced chips. This reflects the growing importance of semiconductors for European industry and society: With the digital transformation, new markets for the semiconductor industry are emerging, such as highly automated cars, artificial intelligence, cloud computing, internet of things, connectivity, defence, space and supercomputers.

The Net-Zero Industry Act will strengthen Europe's manufacturing capacity for net-zero technologies and overcome barriers to scaling up production in the EU. It also aims to reduce the risk of replacing fossil fuels with other strategic dependencies that could hinder access to key technologies and components for the green transition. This will increase the competitiveness of the net-zero technology industrial base and improve the EU's energy resilience.

These policy initiatives underscore the importance of developing precise, relevant monitoring tools that can effectively measure and unravel systemic risks, especially as some firms may be unaware of their excessive dependencies. Against this backdrop, this report investigates how EU firms are navigating the challenges of recent supply chain disruptions. It starts by looking at how international trade has been reshaped since the Great Financial Crisis, with a focus on EU trade integration and related trade dependencies. It shows that, more recently, EU firms have been strongly affected by limited access to raw materials, semiconductors and other intermediate inputs and by disruptions in logistics and transport.

Second, the report analyses firm-level data from the EIB Investment Survey (EIBIS) and the Supply Chain Survey (SUCH) across all 27 EU countries to give an overview of firms' vulnerabilities to supply chain disruptions and their adjustment strategies. These strategies – which include investing in inventory management and diversifying the countries that EU firms trade with – not only enhance companies' resilience and adaptability in times of trade uncertainties, but also contribute to broader economic stability.

Lastly, this report explores the factors that support firms in transforming their operations to enhance resilience, focusing on investments in innovation and digitalisation. Innovation, access to finance and a predictable regulatory environment within the EU single market are key levers to improve Europe's strategic autonomy, ensuring that it can accelerate the twin green and digital transitions.

EIBIS and SUCH survey data

This report relies on analysis of the data from two firm-level surveys: the EIB Investment Survey (EIBIS) and the Supply Chain Survey (SUCH).

EIBIS is a survey, conducted annually by the European Investment Bank (EIB) since 2016, that gathers qualitative and quantitative information on investment activities of non-financial corporations, their financing requirements and the difficulties they face. The survey covers approximately 12 000 firms across the EU and 800 firms in the US. It provides unique information on corporate investment and investment finance of non-financial corporates in all EU countries and the US. Since 2022, the survey has also included questions on supply chain disruptions and strategies to address them.

SUCH is a new survey, conducted by the EIB in collaboration with the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW) of the European Commission, focusing on the supply chains of EU firms that import goods and services from other companies inside or outside the EU. The 2023 survey was carried out from May to October 2023 and covers approximately 1 100 importers across the EU. A large share of firms covered by SUCH are also included in EIBIS.

SUCH provides unique information on the sourcing strategies of EU firms, the countries they trade with, the obstacles they face and the strategies they adopt to address supply chain disruptions. It is complementary to EIBIS, thanks to its focus on importers and the specific questions asked – for example, on the origin of trade partners, the use of tailor-made inputs or the factors determining the substitution of suppliers. The SUCH survey will be conducted annually, with a subset of questions evolving to reflect the changing nature of trade disruptions.

For 37%

of EU firms,
access to raw materials
is a major obstacle to
business activities since
2022

For 34%,

disruptions in logistics
and transport are a
major obstacle

Electronics is the
industrial ecosystem
most affected by supply
chain disruptions,
followed by energy
(including renewables) and
construction

For 23%,

access to
semiconductors
is a major
obstacle

27%

of goods imported in
the EU in 2023 came
from China vs. 24% in
2010

21%

of EU exports went to
the United States in
2023, up from 14% in
2010

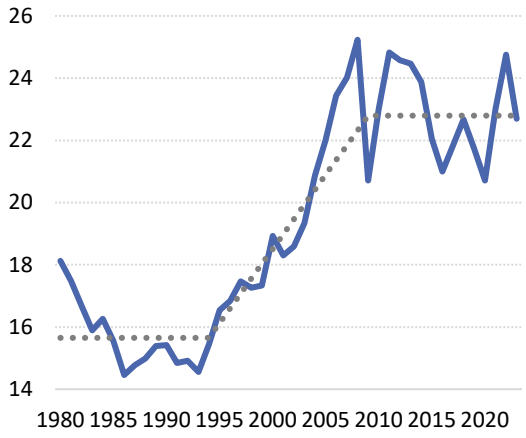
A reconfiguration of global trade and a call to de-risk EU supply chains

International trade has undergone significant shifts in recent years. Several factors have driven the reconfiguration of global trade and the changes in globalisation, including trade tensions between the US and China, the COVID-19 pandemic, shortage of key strategic inputs, rising shipping costs, the Russian military aggression of Ukraine and the energy crisis. Structural changes in the EU's imports and exports over the past decades have altered the distribution of economic ties and made the EU more dependent on trade with some countries, especially for some products (Arjona et al., 2023). As the EU remains deeply integrated in global value chains, the repercussions of the COVID-19 pandemic already started to highlight structural vulnerabilities for the EU economy. This section discusses recent macroeconomic developments in trade and the experience of EU importers using survey data. It shows that EU firms have been strongly affected by limited access to raw materials, semiconductors and other intermediate inputs and by disruptions in logistics and transport.

Shifts in globalisation and a series of crises affecting trade

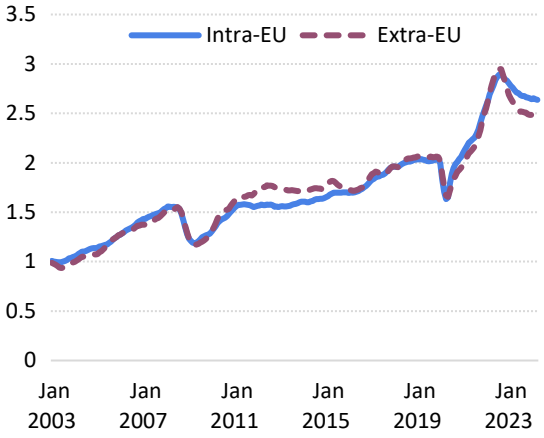
The last three decades saw structural changes in international trade. After 1990, global trade in goods started to grow much faster than world GDP (Figure 1). Between 1960 and 1990, this share had expanded at a relatively modest pace, supported by reductions in transport costs and tariffs (Baldwin, 2022). The rapid globalisation between 1990 and 2010 has been driven by the ICT revolution that decreased communication costs, trade liberalisation and the expansion of offshoring of manufacturing to a few emerging economies, especially China. China's role in international trade and global production networks has grown rapidly, notably after it joined the World Trade Organization in 2001. China has become a key exporter of intermediate inputs and final goods to many economies, including the EU and the US.

Figure 1: World trade in goods, 1980-2023
(share of world GDP, %)



Source: EIB calculations based on WTO and IMF.

Figure 2: EU trade of goods, Jan 2003 - April 2024
(index, Jan 2003 = 1)



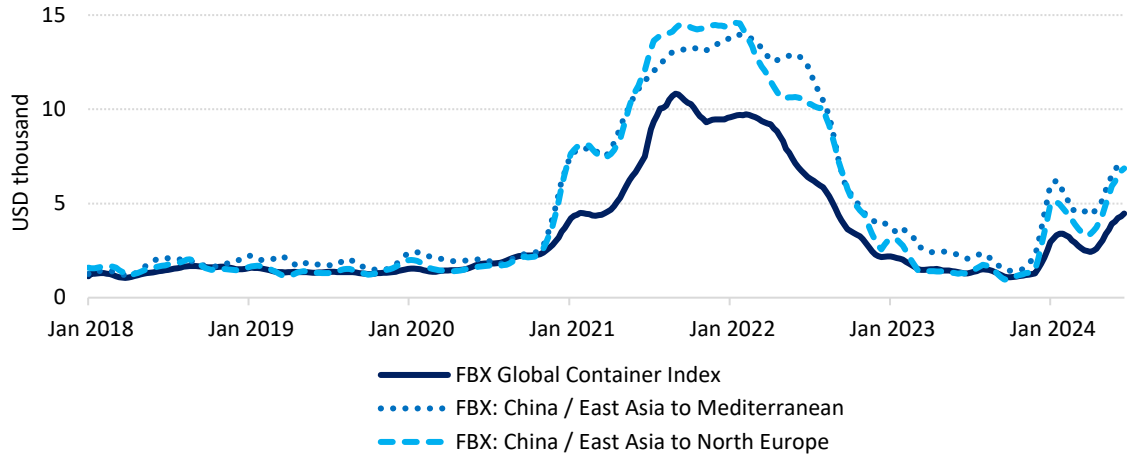
Source: EIB calculations based on Eurostat.

Around 2010, globalisation began to transform, driven by increasing trade regionalisation. This shift in global trade can be explained by various factors. First, the global share of manufacturing goods produced by advanced economies stabilised, putting an end to the offshoring expansion phase. Second, share of intermediate goods imported by China from the rest of the world fell, as China began to rely more on its own industrial base to produce these inputs (Baldwin, 2022). Third, at the end of the period, the trade tensions between China and the US economy led to an increase in tariffs and other trade barriers.

The change in globalisation pattern affected the external trade of the EU countries as well. At the beginning of 2000, intra-EU trade increased slightly faster than extra-EU trade, coinciding with the EU enlargement (Figure 2). Between 2010 and 2013, extra-EU trade outgrew trade within the EU due to weaker economic growth in the EU, stemming from the sovereign debt crisis, which led to internal demand increasing at a much slower rate than external demand. With the European economy recovering in 2014, intra-EU trade's share of total external trade increased again. Intra-EU trade provided a buffer and diversification in the post-COVID period as global trade shocks emerged.

Over the past five years, global trade has been affected by a series of crises. The COVID-19 crisis led to severe trade disruptions for firms and sectors engaged in international trade, due to lockdown measures adopted in many countries and shortages of key products. This caused weaker demand for exporting firms and tightened access to a wide range of inputs, from raw materials to semiconductors, affecting the ability of importers to produce and sell goods (Lebastard et al., 2023). The Russian aggression in Ukraine significantly impacted the EU's access to energy inputs and raw materials like oil, gas, and potash (Di Comite and Pasimeni, 2022). Furthermore, geopolitical tensions have been rising after 2018, owing to the trade conflict between the US and China. The recent crises have underscored the risk of contagion through global value chains for EU firms. Supply chain vulnerabilities have emphasised the need for the EU to diversify exposure to some of its trading partners and enhance resilience against external shocks.

Figure 3: Evolution of shipping costs, Jan 2018 - June 2024
(container freight rate, USD thousand)



Source: EIB calculations based on Freightos Baltic Index (FBX) from EIKON. Note: The FBX expresses the spot price of shipping a 40-foot-long container in USD. For the purpose of illustration, the series in the figure are smoothed using a five-week moving average.

As demand recovered after the COVID-19 crisis, firms looking to replenish depleted stocks were faced with container shortages and surging freight rates. Container shipping costs increased rapidly during 2021, partly due to port congestion (Figure 3). The war in Ukraine also had an impact in 2022,

amplifying operational complexity and congestion at European ports (UNCTAD, 2023). Increased waiting times in ports and higher transportation costs created significant obstacles to EU firms. While freight prices in 2023 decreased thanks to a normalisation in trade demand and volumes, they started to rise again in the first half of 2024. The pirate attacks on commercial ships in the Red Sea prompted shippers trying to reach the EU from East Asia and China to avoid the Suez Canal and take the longer route via the Cape of Good Hope.[1] In the medium term, uncertainties due to the energy transition, new regulatory requirements and climate disasters could create maritime choke points and limit future carrying capacity, thereby increasing transportation costs.

Structural changes among top trade partners for the EU

China and the US are key trading partners for the EU. China's share of EU imports has been rising rapidly (Vandermeeren, 2024). In 2023, 27% of EU imports came from China, up from 24% in 2010 (Figure 4).[2] The share of raw materials and manufacturing goods imported from the US has also been increasing, but at a slightly slower pace, from 12% in 2010 to 14% in 2023.

Between 2010 and 2023, EU imports from the United Kingdom (UK) declined. The share of goods imported from the UK decreased from 13% in 2010 to 7% in 2023. This was mainly due to Brexit, as the decline accelerated after 2016. More recently, trade with the UK has been on the rise, but is still below the pre-Brexit level.

EU trade with Russia has plummeted in recent years. The share of goods imported from Russia (excluding the gas and petroleum trade) fell from 3% in 2010 to less than 1% in 2023. The decline rapidly accelerated in recent years, following the full-scale invasion of Ukraine and the ongoing strategy of sanctions and decoupling from Russia.

The US is a key export market for the EU and receives an increasing share of EU exports. In 2023, 21% of total EU exports went to the US, up from 14% in 2010. During the same period, the share of EU goods exported to China increased from 8% to 9%. The UK represented 12% of manufacturing goods and raw materials exported from the EU in 2023, down from 15% in 2010. For Russia, the share fell from 6% to 2%.

Over the past decade, China's share of US imports declined, unlike EU imports. In 2018 the US started to increase tariffs on specific products and trading partners, including China.[3] Consequently, the share of US imports from China started to decline and trade shifted towards other countries, such as Mexico and Viet Nam (Fajgelbaum et al., 2020; Alfaro and Chor, 2023). China's share of US imports of manufacturing goods and raw materials declined to 16%, down from 25% in 2010, with a rapid decline after 2018 (Figure 5).[4] During the same period, the share of US exports to China remained stable, at

[1] During this period, shippers in North America were also affected by the collapse of a bridge near the port of Baltimore, and faced drought-based restrictions on the Panama Canal.

[2] In terms of individual products imported to the EU from China, the highest increase was for road vehicles, electric machinery and chemicals (EIB, 2024a).

[3] To reduce the US trade deficit and enhance economic security, the US administration increased tariffs on many products, including solar panels, washing machines, steel, electric vehicles and batteries and semiconductors. Many of these targeted Chinese imports to the US.

[4] In terms of products, the decline of China in US imports affected not only lower-tech industries such as apparel, footwear and accessory production, but also goods produced by high-tech industries, such as office machines and telecommunications equipment (OECD, 2023). However, during the same period, China's share in EU imports of these products increased.

8%. The share of US imports from the EU increased from 17% in 2010 to 20% in 2023, and the share of US exports to the EU increased from 16% to 18%. Similarly, the share of US imports from Mexico increased from 12% to 16%, and Mexico's share in US exports rose from 13% to 16%.

Figure 4: Top trade partners in EU imports and exports of manufacturing goods, 2010-2023
(share of total EU manufacturing trade, %)

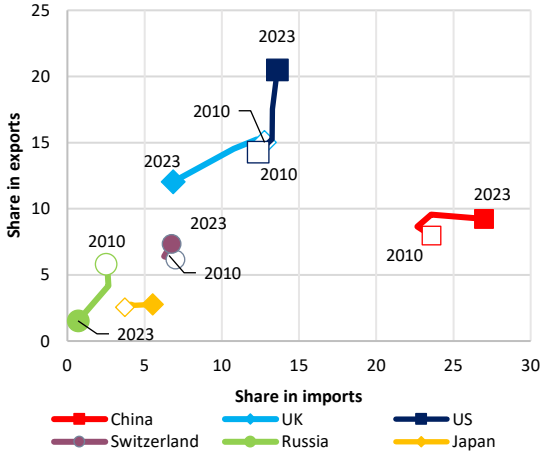
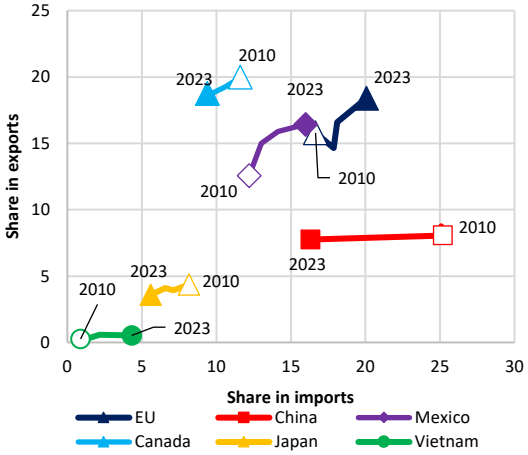


Figure 5: Top trade partners in US imports and exports of manufacturing goods, 2010-2023
(share of total US manufacturing trade, %)



Source: EIB calculations based on Eurostat (Comext) and Census Bureau data. Note: Exports and imports are shown for six major trading partners for 2010, 2014, 2018 and 2022 for the EU (left) and the US (right). Only trade in goods of SITC 10 to 89 are considered, excluding gas and petroleum trade (SITC 33, 34).

Rebalancing US imports may not have decreased dependence on China. Countries from which imports to the US increased, such as Viet Nam, Thailand and South Korea, in turn increased their imports from China.[5] For example, the rise in Chinese exports to Viet Nam contributed 6% to China's overall export growth in the period, while Viet Nam is also the country that saw the biggest increase in its share of imports to the US (Alfaro and Chor, 2023; EIB, 2024a). This phenomenon of Chinese products and value added flowing into the US via a third country is corroborated by evidence that countries that saw faster growth in exports to the US in strategic sectors also had more intense intra-industry trade with China in those same sectors (Freund et al., 2023). These complex, indirect changes in trade patterns suggest that implementing an EU plan to reduce direct or indirect exposure to China may prove challenging for some strategic products or sectors.

The EU's strong integration in global value chains

The EU is well integrated in the global economy, and production of the goods and services it sells abroad relies on both domestic and imported sources. Trade liberalisation and digitalisation have allowed firms to reap the benefits of specialisation by obtaining inputs and producing parts in different locations, and at different parts of the supply chain (WTO, 2019; Alfaro and Chor, 2023). However, recent crises have shown that fragile supply chains expose firms and countries to trade disruption risks.

[5] The share of Japan in US and EU imports has been decreasing over the past decade, while the share of South Korea has been increasing. Some of the imports from Japan have hence been substituted with imports from South Korea, for example in electronics and electrical equipment.

Depending on the manufacturing subsector, the EU imports 13% to 22% of the inputs used to produce the goods it exports. The remaining inputs originate from within the EU single market. The EU's rate of backward participation[6] tends to be higher than in the US, which comes with a greater risk of supply chain disruptions. It is also higher than in China, except for electronics, automotive and machinery. At the same time, the share of China in the value added of EU exports is higher than the share of China in US exports, suggesting that in key sectors, the EU is more dependent on Chinese imports than the US. Nevertheless, the EU is also an important source of inputs for the goods produced and exported by its trading partners. The US buys a higher share of inputs from the EU than from China in the sectors of basic manufacturing, chemicals (including pharmaceuticals), ceramics and metals. Furthermore, China also buys a higher share of inputs from the EU than from the US (Figure 6).

Figure 6: Foreign value added content of exports in 2019, by country and sector
(share of value added, %)

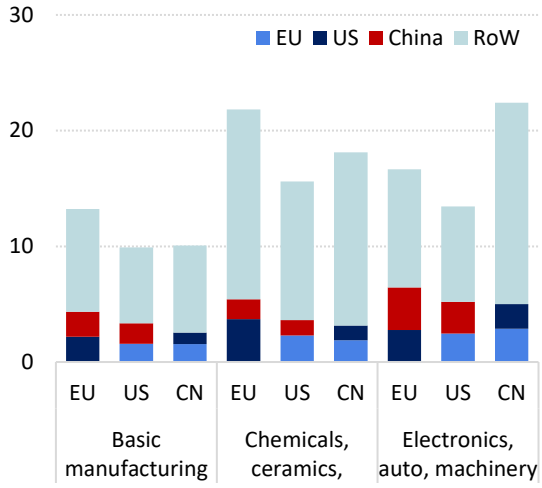
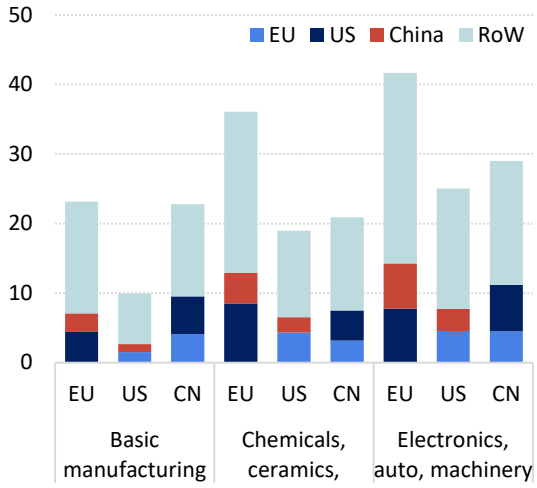


Figure 7: Location of final demand for domestic value added in 2019, by country and sector
(share of value added, %)



Source: EIB calculations based on OECD TiVA. Note: Calculations based on Belotti et al. (2021). Basic manufacturing (NACE 10 to 18, 31 to 32) Chemicals, ceramics, metals (NACE 19 to 25) and Electronics, automotive, machinery (NACE 26 to 30). RoW: Rest of the world.

The US and China are important markets for the final products exported by the EU. Other countries, such as Switzerland and the UK, are also significant export markets. Depending on the sector, between 23% and 42% of manufacturing products produced in the EU are consumed abroad, with the remainder sold within the EU (Figure 7). The share of final goods exported to other countries is lower in the US and China (except for basic manufacturing) than in the EU, reflecting the greater importance of the domestic market for those economies.

Overall, the EU is more exposed to a reconfiguration of globalisation and to trade disruptions with China. The EU is more integrated, but also more dependent on global production networks and foreign trading partners, for both imports and exports. This exposes the EU to higher risks of supply chain disruptions and implies higher adjustment needs if current value chains disintegrate.

[6] Backward participation in the global value chain is measured by the foreign value-added content of exports, and corresponds to the value added of inputs that were imported in order to produce intermediate or final goods and services to be exported.

Box A: The EU methodology to identify strategic dependencies

In 2021, as part of the update to the EU Industrial Strategy, the European Commission carried out an analysis of the EU's strategic dependencies and capacities, which included a new bottom-up assessment of import dependencies across sensitive industrial ecosystems (European Commission, 2021). This assessment was recently updated to include methodological refinements and the latest data developments (Arjona et al., 2023).

To identify foreign dependencies in sensitive industrial ecosystems, more than 5 000 products imported by the EU were reviewed. A product is defined as foreign-dependent if it fulfils three criteria:

1) most extra-EU imports of the product originate in less than three foreign countries

2) extra-EU imports of the product are equal to at least half of total intra-EU imports of it

3) extra-EU imports of the product are higher than total EU exports of it.

On this basis, the latest update of the assessment identifies 204 products in sensitive industrial ecosystems in which the EU has foreign dependencies (Figure A1). Moreover, a particular subset of the 204 foreign-dependent products is defined labelled as particularly problematic because their worldwide trade networks can experience Single Point of Failures (SPOFs). SPOFS are nodes in the global trade system that, due to their centrality and weight, can have a major impact on supply chains and even halt their operation (Arjona et al., 2023). In identifying these particularly problematic products, one can differentiate between those with potential for diversification (i.e. low risk of SPOFs) and those where further trade diversification might be limited (i.e. high risk of SPOFs).

Figure A1: Mapping the origins of 204 dependent products, including examples

Source: Arjona et al. (2023).

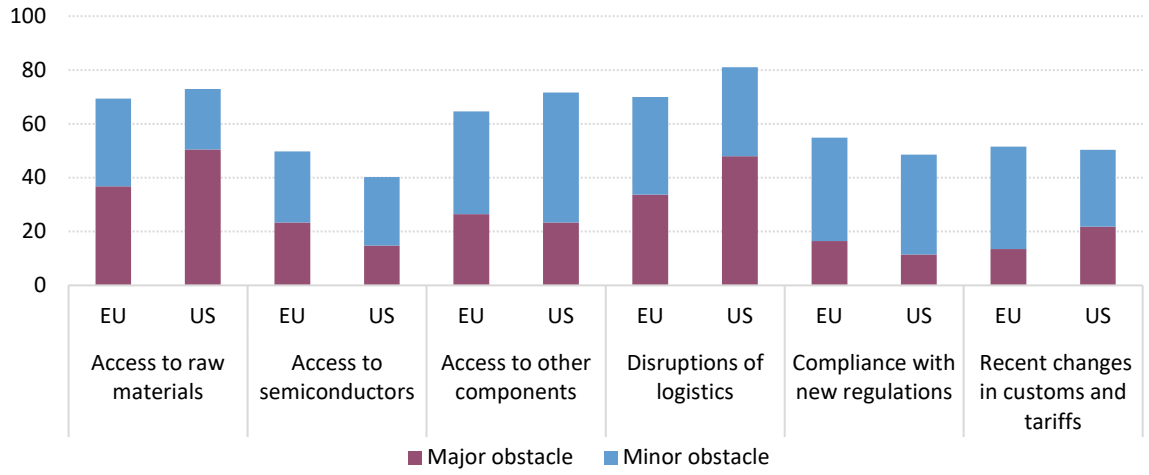
The impact of supply chain disruptions on EU firms

In recent years, a large share of EU firms has faced major obstacles to their business activities, supply chains and trade. According to the EIBIS, since the beginning of 2022, access to commodities and raw materials (steel, copper, fossil fuels, lithium, etc.) – many of which are essential for the green and digital transitions – have been reported as major obstacles by 37% EU importers (Figure 8). About a third of EU importers (34%) also consider that disruptions of logistics and transport are major obstacles to their business activities. Other major obstacles include access to semiconductors and microchips (23%), and access to other components, semi-finished products and equipment (27%).

The trade disruptions reported by US importers differ from those of their EU peers. Compared to firms in the EU, US importers are more likely to cite access to commodities or raw materials, as well as disruptions of logistics and transport, as major obstacles. They are also more likely to consider recent changes in customs and tariffs as a major obstacle. At the same time, they are less likely than EU peers to report access to semiconductors as a major obstacle, or to consider compliance with new regulations, standards or certifications as a major obstacle.

Figure 8: Trade disruptions for EU and US importers in 2023

(share of importers, %)

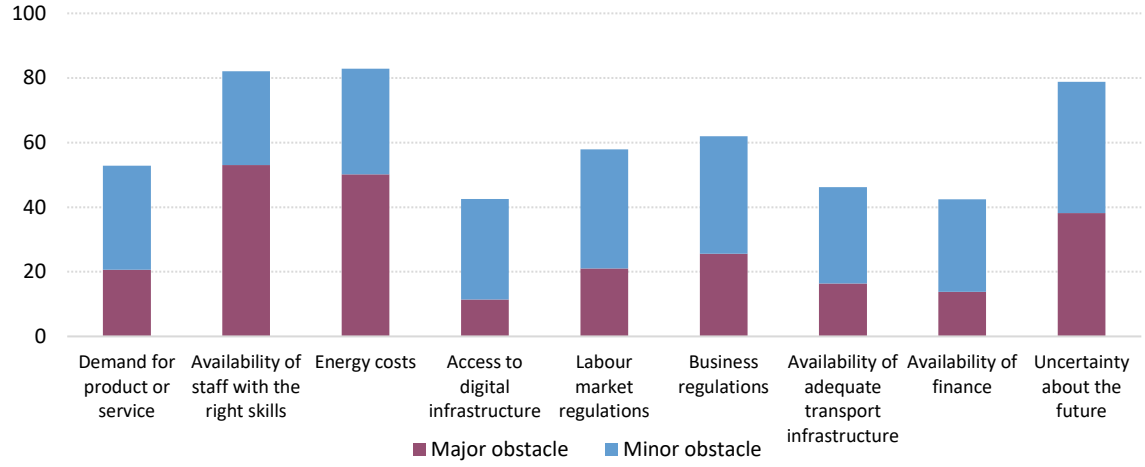


Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023. Note: Firms are weighted by value added.

The impact of supply chain disruptions on EU importers is substantial. To put their importance into perspective, they can be compared to other long-term obstacles to investment, as reported in EIBIS. The major barriers to investment most frequently mentioned by EU importers include the availability of staff with the right skills (53%), energy costs (50%) and uncertainty about the future (38%), as shown in Figure 9. More broadly, the evidence from Figures 8 and 9 shows that EU importers perceive supply chain disruptions as serious impediments. For example, more than 20% of EU importers consider that business regulations or labour market regulations are major obstacles to investment. At same time, close to 35% of EU importers report access to raw materials or disruptions of logistics as being major obstacles to their business activities since the beginning of 2022.

Figure 9: Long-term obstacles to investment for EU importers in 2023

(share of importers, %)

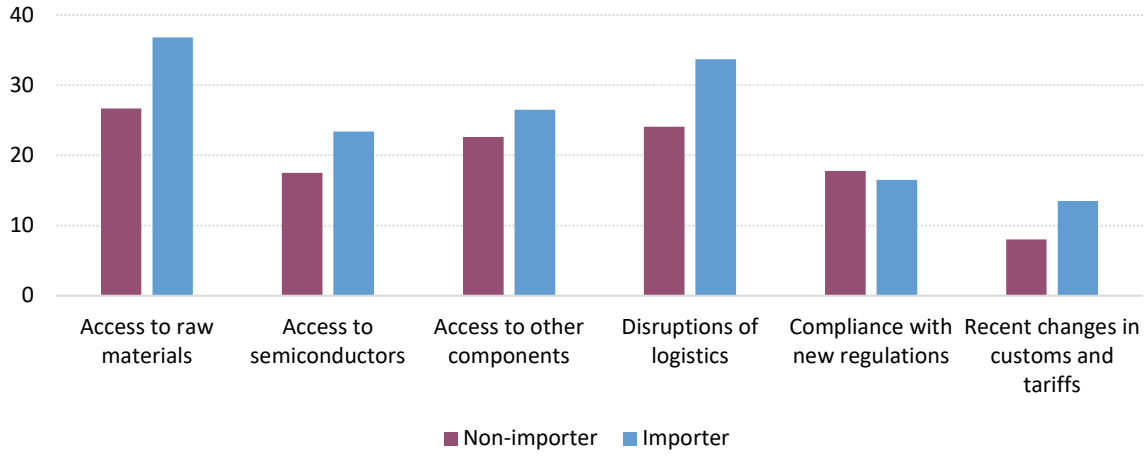


Source: EIB calculations based on EIBIS wave 2023. Note: Firms are weighted by value added.

Firms that do not import inputs from abroad are also affected as trade disruptions propagate through supply chains. More than one-third of EU importers report that limited access to raw materials or disruptions of logistics have been major obstacles to their business activities since the beginning of 2022 (Figure 10). Furthermore, around a quarter of importers indicate they were affected by limited access to semiconductors and other components. Although the share of non-importing EU firms that report being affected by trade disruptions is lower than that of importers, about a quarter of non-importers consider limited access to raw materials or other components as major obstacles. This highlights how supply chain disruptions can affect all firms in the economy.

Figure 10: Major trade disruptions for EU firms, by trade status

(share of firms, %)

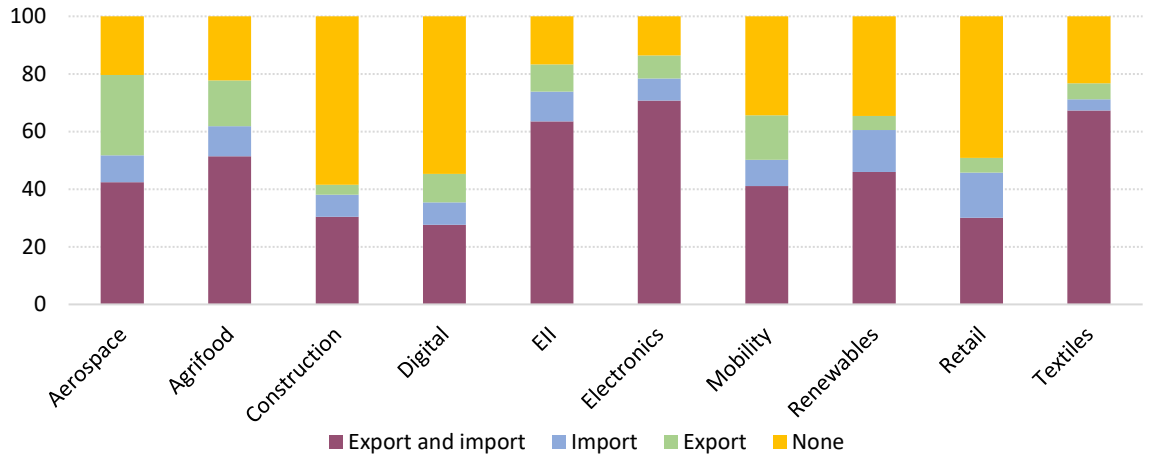


Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023. Note: Firms are weighted by value added.

Trade participation varies substantially across industrial ecosystems. The ecosystem approach is a methodology developed by the European Commission to monitor the EU single market (European Commission, 2022).[7] It extends and complements the analysis of supply chains by sector, to highlight the network of complex interlinkages between economic operators in the EU. In the ecosystems of electronics, energy intensive industries (EII), aerospace, agrifood and textile, more than 75% of firms engage in international trade by importing or exporting (or both), compared to less than 50% in the retail, digital and construction ecosystems (Figure 11).[8]

Figure 11: Trade participation, by industrial ecosystem

(share of firms, %)



Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023. Note: Firms are weighted by value added. Industrial ecosystems based on the definition of DG GROW. EII: Energy intensive industries.

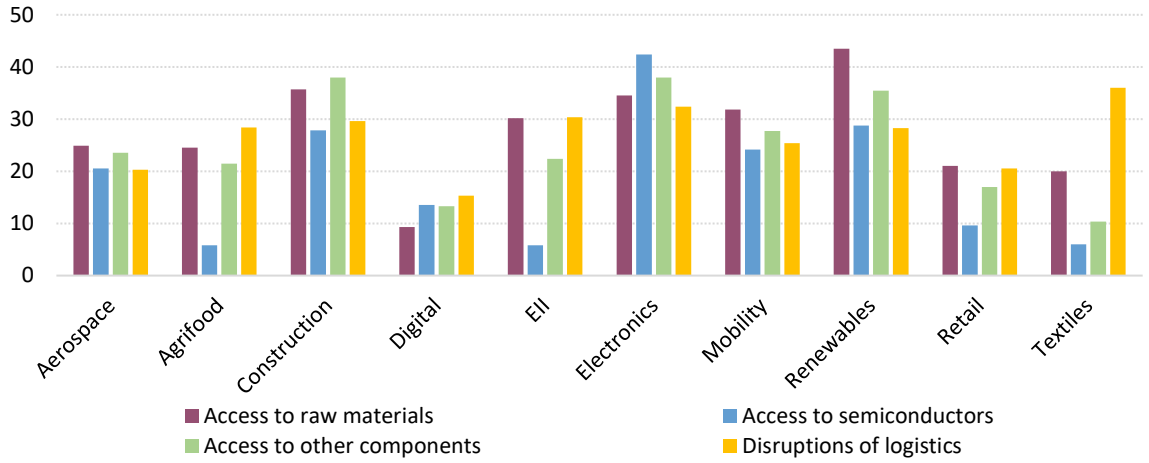
Electronics is the industrial ecosystem most affected by supply chain disruptions, followed by energy (including renewables) and construction. Firms in these ecosystems are more likely to report having been exposed to various trade-related obstacles (Figure 12). However, the nature of the disruptions varies across ecosystems. For example, firms in the electronics ecosystem are more likely to report access to semiconductors as major obstacle, while firms in energy (including renewables) mention access to commodities or raw materials as the most recurrent obstacle. In ecosystems characterised by greater supply chain integration – particularly those with a higher share of importers, such as electronics and energy intensive industries – firms have experienced more pronounced impacts from trade disruptions. However, ecosystems with less intensive trade activity can also be affected by disruptions that propagate along the supply chain. Despite its relatively low share of importers, trade disruptions in the construction ecosystem seem quite prevalent. The most frequently reported obstacles are related to access to raw materials or semi-finished products.

[7] The classification of sectors in ecosystems is derived from national accounts, input-output tables, structural business statistics, firm-level microeconomic data, sector-specific studies and expertise. Each sector is attributed to an ecosystem according to its contribution to the activities of the ecosystem. Some sectors are attributed to more than one ecosystem, so that ecosystems overlap. There are also horizontal sectors, such as rental and leasing activities or some parts of manufacturing, that have been identified to be relevant for all ecosystems.

[8] Figures 14 and 15 show results for ten of the 14 ecosystems. Some of the 14 ecosystems consist of firms operating in other categories of the economy than those surveyed in the EIBIS (EIB, 2024b). For example, the health ecosystem receives substantial contributions from human health services and social work activities (NACE category Q).

Figure 12: Major trade disruptions, by industrial ecosystem

(share of firms, %)



Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023. Note: Firms are weighted by value added. Industrial ecosystems based on the definition of DG GROW. EII: Energy intensive industries.

44%

of EU firms importing from China report major disruptions in logistics and transport

vs. **22%**

of firms that only import from within the EU

31%

of firms that use tailor-made inputs have invested in digital input tracking

vs. **17%**

of firms that do not

In response to supply chain disruptions, EU firms have increased inventories, invested in digital input tracking, and diversified the countries from which they import

When selecting a new supplier,

70%

of EU importers consider the quality and standards offered by the supplier to be very important

58%

cite the price of the goods from the new supplier as a key factor

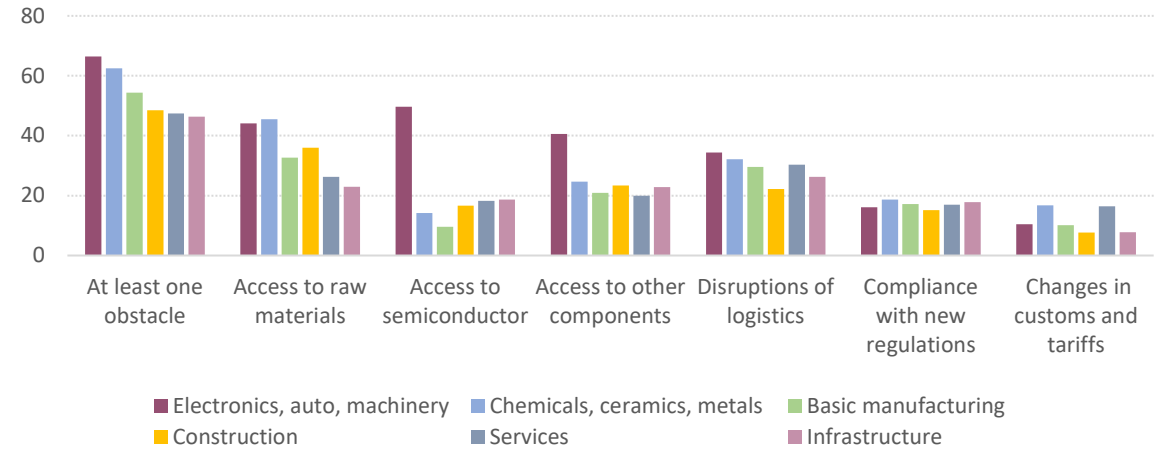
Adjustment strategies to supply chain disruptions

EU firms have demonstrated remarkable agility in addressing recent supply chain disruptions through multifaceted responses. Firms have increased stocks and inventory, invested in digital inventory and inputs tracking, and diversified or increased the number of countries they import from. This section explores adjustment strategies, showing how they depend on specific vulnerabilities and firm characteristics. It discusses how transient trade disruptions can be managed at the microeconomic level. Not only do these strategies enhance the resilience and adaptability of firms in times of trade uncertainties, but they also contribute to economic stability and security more broadly.

Uneven exposure of EU firms to supply chain disruptions

All sectors of the EU economy have been affected by the recent supply chain disruptions. More than 46% of firms in each sector report at least one major trade obstacle affecting their activities since the beginning of 2022 (Figure 13). Firms in the manufacturing sector appear to be more vulnerable to supply chain disruptions. This is especially true in two manufacturing subsector groups in particular: electronics, automotive and machinery; and chemicals, ceramics and metals. In these subsectors, more than 60% of firms reported having been affected by at least one major trade disruption.

Figure 13: Major trade disruptions, by sector
(share of firms, %)



Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023. Note: Firms are weighted by value added. Basic manufacturing (NACE 10 to 18, 31 to 32), Chemicals, ceramics, metals (NACE 19 to 25), Electronics, automotive, machinery (NACE 26 to 30), Construction (NACE 41 to 43), Services (NACE 45 to 47, 55 to 56), Infrastructure (NACE 35 to 39, 49 to 53, 58 to 63).

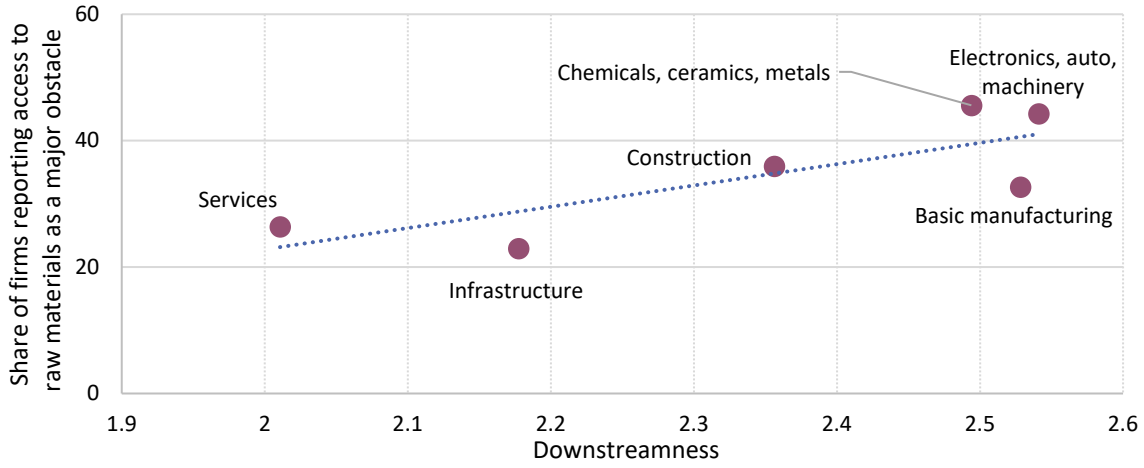
EU firms active in electronics, automotive and machinery were particularly affected by supply chain disruptions related to access to semiconductors other components. 50% of firms in the electronics, automotive and machinery subsectors report access to microchips and semiconductors as a major obstacle, compared to less than 15% in other manufacturing subsectors. Similarly, 41% of firms in that subsector group report access to other components, semi-finished products or equipment as a major obstacle; this figure is less than 25% for the other sectors. Some subsectors are more vulnerable to specific supply chain disruptions and rely more on specific inputs that are difficult to substitute.

Greater exposure to trade disruptions can also be attributed to greater integration into the supply chain and global production networks.

Logistics and transport disruptions appear to have affected all EU firms at similar rates, irrespective of sector. Across sectors, the share of firms reporting them as a major obstacle ranges from 22% in construction to 34% in electronics, automotive and machinery. Similarly, across the board, compliance with new regulations affected between 16% and 19% of importers, while the share of EU importers considering recent changes in customs and tariffs was even lower.

Firms in downstream sectors are more likely to report access to raw materials as a major obstacle to their activities. EU firms in downstream sectors have production processes relying on other sectors: They often purchase intermediate inputs from industries that themselves use intermediate inputs intensively.[9] The finding that firms in more downstream sectors are more constrained in access to commodities and raw materials (Figure 14) is also suggestive of obstacles and shocks cumulating along the value chain.

Figure 14: Downstreamness and access to raw materials as major obstacle, by sector
(share of firms, %)

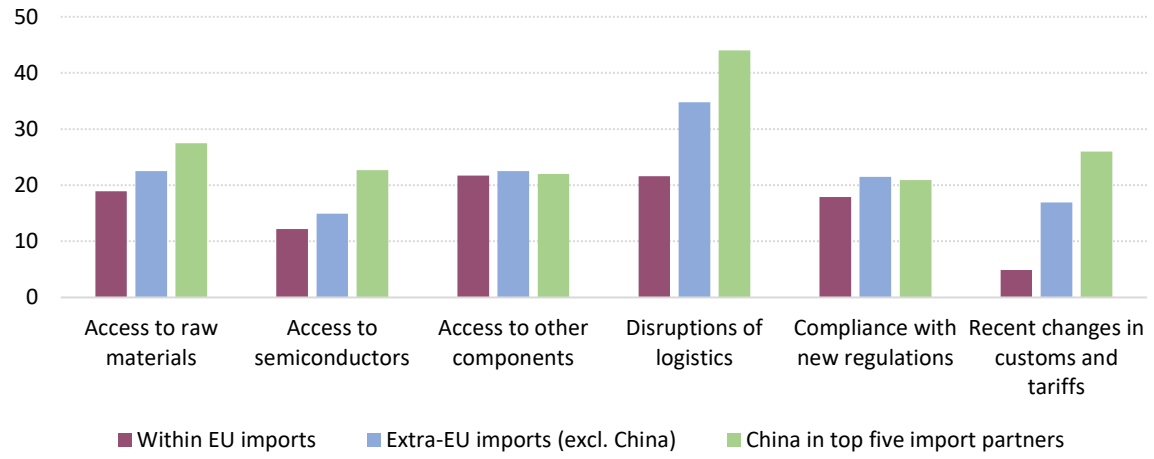


Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023 and Mancini et al. (2024). Note: Firms are weighted by value added. The measure of downstreamness is based on Mancini et al. (2024). See the note to Figure 13 for the subsector groups.

Intra-EU trade tends to cushion importers from trade disruptions. Firms importing only from within the EU are less likely to have been affected by supply chain disruptions than firms importing from outside the EU (Figure 15) according to SUCH, which covers a subsample of EU importers from the EIBIS. A firm can be defined as an extra-EU trader if it cites a non-EU or non-EFTA country as its most important import trade partner. EU firms that import from outside the EU, and in particular from China, are more likely to report access to raw materials, access to semiconductors, disruptions of logistics and transport, and recent changes in customs and tariffs as a major obstacle to business activities since the beginning of 2022. For example, 44% of EU firms importing from China consider disruptions of logistics and transport to be a major obstacle, compared to 22% of firms that only import from within the EU.

[9] Downstreamness is measured as the total number of steps (sectors) that make up the production of a given sector's output, weighted by the share of value added that each sector in the chain adds to the final value of that output. The steps are counted backwards from the last production step; thus, the further away the final good is from the first source of value added (for example, mining), the higher its downstreamness.

Figure 15: Major trade disruptions for EU importers, by origin of import partners
(share of importers, %)



Source: EIB calculations based on SUCH survey wave 2023. Note: Firms are weighted by value added. A firm is defined as an extra-EU trader if it cites a non-EU or non-EFTA country as its most important import trade partner.

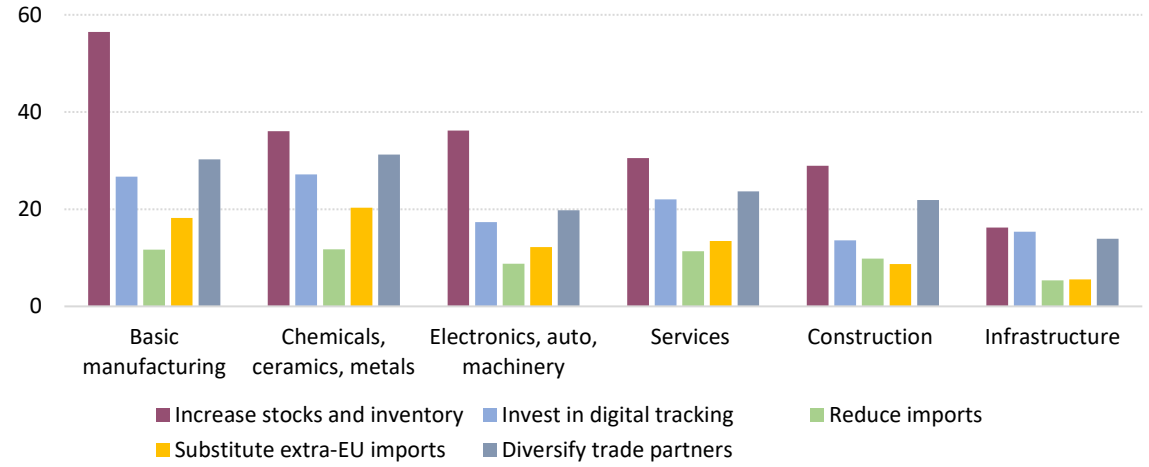
Inventory management as the most common adjustment strategy

Increasing stocks and inventory is the most common action taken by firms to adjust their supply chains. As firms were particularly impacted by access to inputs and disruptions in logistics and transport (as highlighted in Figure 13), more than 56% of firms in electronics, automotive and machinery responded by increasing stocks and inventory, according to the EIBIS (Figure 16). The share of firms increasing stocks is 36% in the subsectors of chemicals (including pharmaceuticals), ceramics and metals, and in basic manufacturing. It is lower in services (31%) and construction (29%), and particularly low (16%) in utilities, transportation, information and communication. One reason that building inventory is the most frequent response to trade disruptions may be that it does not automatically require changing the production process or finding new sources of supply.

Trade diversification and digitalisation are also frequently reported adjustment strategies. Depending on the manufacturing subsector, between 20% and 31% of firms report having diversified or increased the number of countries they import from. The share of firms diversifying suppliers is 24% in services, 22% in construction and 14% in utilities, transport and ICT. Investment in digital inventory and inputs tracking, which allow firms to track goods through the supply chain and delivery to their premises, is also often used as a response to trade disruptions: It is reported by 27% of firms in electronics, automotive and machinery, and in chemicals, ceramics and metals, and by 14% to 22% in the other sectors.

A relatively low share of EU firms reduces imports or substitutes imports from outside the EU with imports from within the EU to respond to recent trade disruptions. The share of firms that are substituting imports, by nearshoring and finding suppliers within the EU, is higher in basic manufacturing (18%), and in chemicals, ceramics and metals (20%) than it is in other sectors (6% to 13%). The share of firms reducing imports, without substituting the inputs, is low across all sectors (5% to 12%).

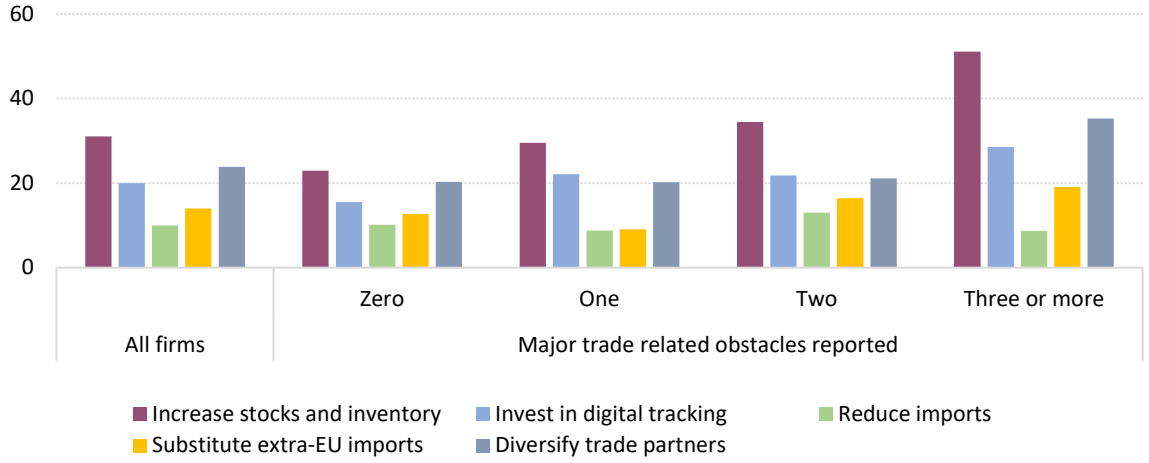
Figure 16: Responses to trade disruptions, by sector
(share of firms, %)



Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023. Note: Firms are weighted by value added. See note to Figure 13 for the subsector groups.

Firms facing multiple trade-related obstacles are more likely to adopt adjustment strategies, especially by increasing stock and diversifying. The share of firms that respond by building up inventory – the most common strategy – increases with the number of major trade-related obstacles reported (Figure 17). Other strategies, such as diversification of suppliers, digital tracking or substituting extra-EU with EU imports, are also more frequent for firms in the most difficult situations, namely those experiencing three or more major trade-related obstacles. Yet, firms that report none of the major trade-related obstacles also tend to adjust their supply chain strategies. The share of firms reporting no major trade obstacles ranges from 36% in electronics, automotive and machinery to 54% in infrastructure (see Figure 13).

Figure 17: Responses to trade disruptions, by number of major trade disruptions reported
(share of firms, %)



Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023. Note: Firms are weighted by value added.

Inventory management and stockpiling increase firms' resilience to trade disruptions in the short term. Higher inventory levels cushion the impacts of supply chain disruptions and volatility in shipping costs on output (Alessandria et al., 2023; Lafrogne-Joussier et al., 2023a). Keeping a high level of inventory tends to be less costly than reducing imports, substituting extra-EU with EU suppliers, or seeking any possible trade diversification. Better inventory management also helps firms avoid issues

with production continuity, whether in maintaining consistent quality of products or services, or in dealing with short-term variation in demand.

Firms importing from outside the EU are much more likely to increase stock and diversify trade partners than firms importing only from the EU. Increasing inventory and stocks is the most common response reported by EU importers, but the share of firms taking action tends to depend on the number and origin of trading partners: According to SUCH, 46% of firms importing from China report increasing stocks, compared to 28% of firms importing inputs from the EU alone (Figure 18). EU firms importing from China are also generally more likely to implement adjustment strategies to trade disruptions. That may be explained by disruptions in logistics and transportation due to higher shipping costs from China (see Figure 15).

Diversification can dampen trade shocks. Complex traders, which import from three or more different countries, are also more likely to implement adjustment strategies than simple traders (Figure 19). However, complex traders are less likely to reduce imports than simple traders, which import only from one or two countries. The diversification strategy is a response to the high level of uncertainty and specific trade disruptions.

Figure 18: Responses to trade disruptions, by origin of import partners
(share of importers, %)

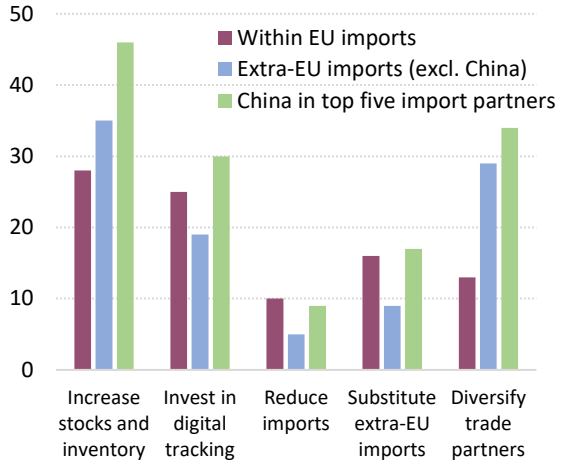
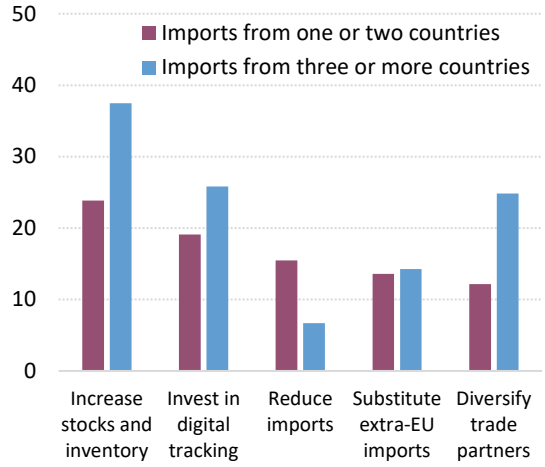


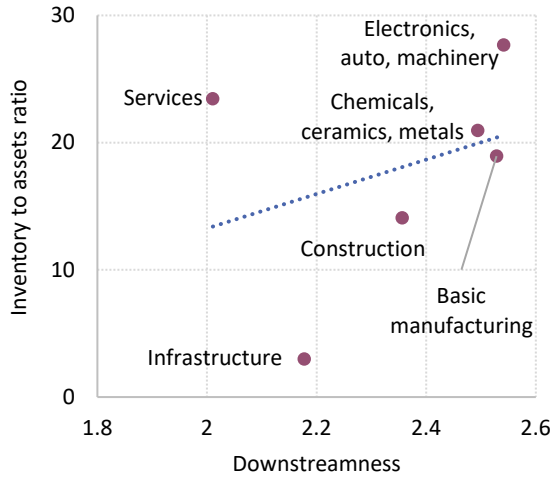
Figure 19: Responses to trade disruptions, by number of import partners
(share of importers, %)



Source: EIB calculations based on the SUCH survey wave 2023. Note: Firms are weighted by value added. A firm is defined as an extra-EU trader if it reports a non-EU or non-EFTA country as its most important import trade partner.

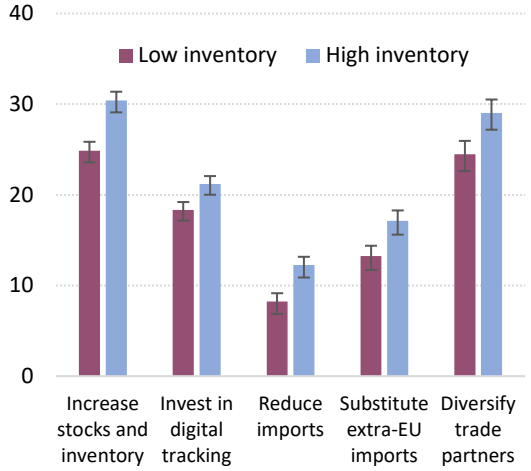
Firms in downstream sectors, which rely more on inventories, are more likely to put in place adjustment strategies to trade disruptions. They are more sensitive to disruptions in the value chain and in turn also keep higher level of inventories (as a share of assets) than firms in more upstream sectors (Figure 20). Firms with higher inventory levels are more likely to report adjustments to their supply chain strategies across all dimensions surveyed for (Figure 21). Unsurprisingly, they are more likely to increase stocks and inventories than other firms. Interestingly, firms with higher inventory reduce imports more, presumably due to having previously applied a stockpiling strategy; this makes them more resilient and less exposed to potential disruptions ex-post.

Figure 20: Downstreamness and inventory to assets ratio, by sector
(ratios, %)



Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023, ORBIS and Mancini et al. (2024). Note: Firms are weighted by value added. The downstreamness index measuring the distance from the primary production inputs is based on Mancini et al. (2024) and is available at the sector country level. Inventory is based on information from the balance sheets of the firms in Orbis. See note to Figure 13 for the subsector groups.

Figure 21: Probability of responding to trade disruptions, by inventory level
(estimated probabilities, %)



Source: EIB estimates based on the SUCH survey using the EIBIS sample of wave 2023 and Orbis. Note: The figure shows the estimated coefficients from five different logistic regressions, evaluated at the first and last decile of the inventory ratio distribution, where the dependent variable is a response to trade disruptions (for example, increasing stock and inventory). Inventory is based on information from the balance sheets of the firms in Orbis. The regressions control for trade obstacles, firm size, trade status, country and sector. Confidence intervals at 10% significance level.

Firms relying on tailor-made inputs are more vulnerable

Companies that rely heavily on tailor-made inputs – components or materials specifically designed for their products – may be less able to diversify fast. Tailor-made products and relationship-specific trade investments are at the heart of global value chains. Larger companies are more likely to rely on tailor-made goods: about 55% of large companies report using tailor-made inputs, versus around 40% of small enterprises (Figure 22). While tailor-made inputs can improve efficiency, they may also limit flexibility during supply chain disruptions. Finding alternative suppliers to replace tailor-made inputs can be very difficult, as they cannot be easily substituted – for example, by buying in anonymised markets where direct relationships with suppliers are absent. Similarly, if a firm suddenly faces an increased demand for its goods, it may have trouble finding the inputs to scale up (Antràs, 2020). Compared to firms in other sectors, firms in electronics, machinery and the automotive sector rely more on such inputs. Firms in sectors with a higher share of tailor-made inputs are more likely to report supply chain disruptions (Figure 23).

Figure 22: Firms with tailor-made inputs, by firm size
(share of importers, %)

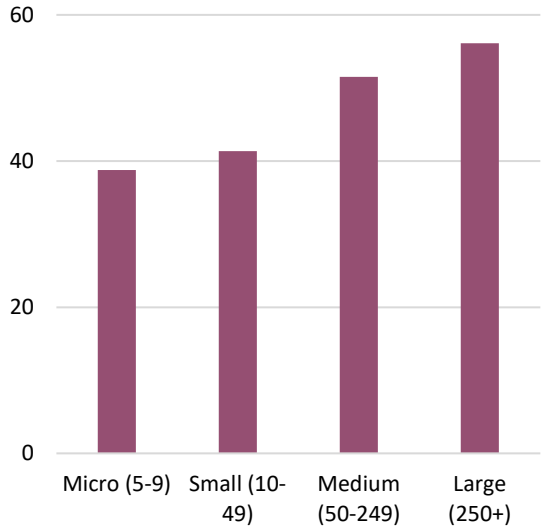
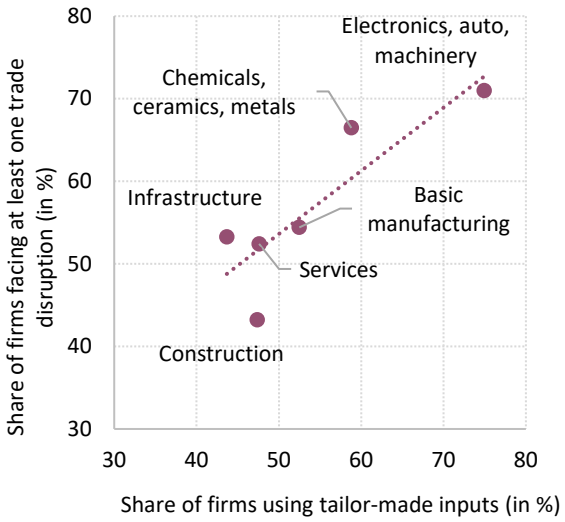


Figure 23: Tailor-made inputs and trade disruptions, by sector
(share of importers, %)



Source: EIB calculations based on the SUCH survey wave 2023 and EIBIS wave 2023. Note: Firms are weighted by value added. See note to Figure 13 for the subsector groups.

When facing trade disruptions, firms using tailor-made inputs are less likely to reduce imports or diversify because, in the short term at least, they are more tied to their suppliers. As a response to trade disruptions, firms with tailor-made inputs are much more likely to invest in digital inventory and inputs tracking (Figure 24). They tend to be larger and have more room to adjust to transient disruptions. Regarding their contractual relationships with suppliers, firms that use tailor-made inputs are more likely to have partial ownership of their suppliers. Conversely, they tend to engage less in procurement through intermediaries, rather than directly with suppliers (Figure 25). Vertical integration of suppliers may help reduce vulnerability to trade disruptions, as firms will be less affected by third-party disruptions (Grossman et al., 2023). Supplier diversification can slow down recovery from trade disruptions, while long-term relationships speed it up (Alfaro and Chen, 2012).

Figure 24: Responses to trade disruptions, by tailor-made inputs status
(share of importers, %)

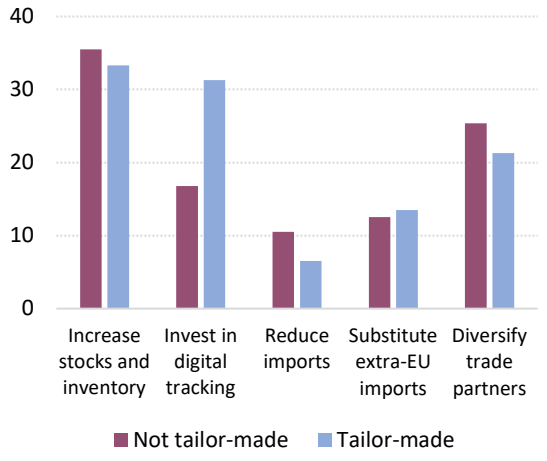
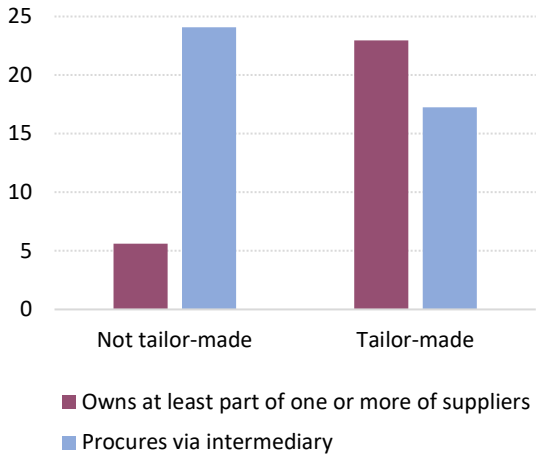


Figure 25: Contract type with suppliers, by tailor-made inputs status
(share of importers, %)



Source: EIB calculations based on the SUCH survey wave 2023. Note: Firms are weighted by value added.

Firms importing inputs from outside the EU feel it would be difficult to find alternative suppliers in the EU. For instance, 65% of companies relying mostly on non-EU imports excluding China report that it would be difficult to substitute with inputs from the EU, compared to 41% of firms that import all their inputs from within the EU (Figure 26). Firms trading with China view this as even harder (68%). This may be due to the specific raw materials or intermediate inputs imported from outside the EU, such as commodities, semiconductors or semi-finished products in sectors like automotive, particularly those producing electric vehicles. These results are in line with evidence showing that most of the firms importing crucial production inputs from non-EU countries – especially from China – have not yet pursued de-risking measures. The challenge lies in dealing with inputs that are difficult to substitute. However, for firms that do implement de-risking strategies, the most frequent strategy is to substitute extra-EU suppliers with intra-EU ones (Balteanu et al., 2024).

EU firms that have their main supplier in their home country find it easier to substitute their suppliers with others in their country. Conversely, firms whose main suppliers are not located in their home country report that it would be more difficult to find an alternative supplier in their country than firms that already source their inputs on their domestic market (Figure 27). At the same time, the share of firms reporting that it would be difficult to find a new supplier in another EU country is similar no matter whether their main supplier is in the home country or elsewhere in the EU. This suggests that the EU single market is functioning properly and creating an EU-wide level-playing field.

Figure 26: Difficulty substituting suppliers, by origin of import partners
(share of importers, %)

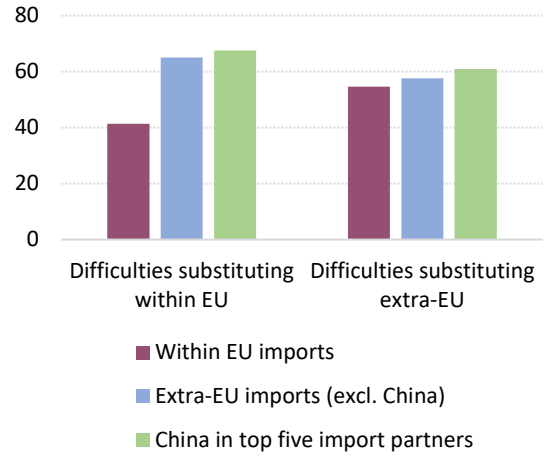
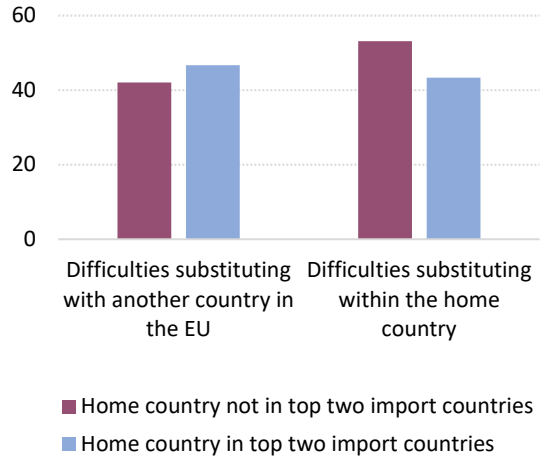


Figure 27: Difficulty substituting suppliers, for firms with domestic suppliers
(share of importers, %)



Source: EIB calculations based on the SUCH survey wave 2023. Note: Firms are weighted by value added. A firm is defined as an extra-EU trader if it reports a non-EU or non-EFTA country as its most important import trade partner.

The ability to substitute across suppliers is influenced by intrinsic elements of products, such as quality and standards or prices, and by external factors, such as distance and delivery time or geopolitical risk and security of supply. When choosing a new supplier, 70% of EU importers report that the quality and standards provided by the new supplier would be a very important factor, and 58% cite the price of the goods sold by the new supplier (Figure 28). The share of EU importers considering distance, delivery costs and delivery time as a very important factor is similar to that for geopolitical risk and security of supply (37% and 36%). This can be associated with the increased complexity in substitution, especially when extra-EU trading partners are among the top five trading partners (excluding China).

Figure 28: Importance of factors in choosing a new supplier
(share of importers, %)

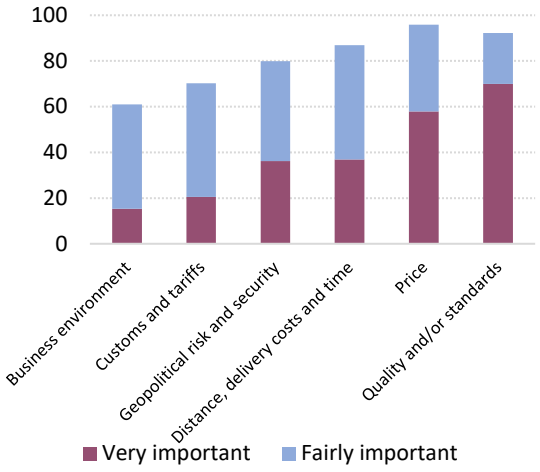
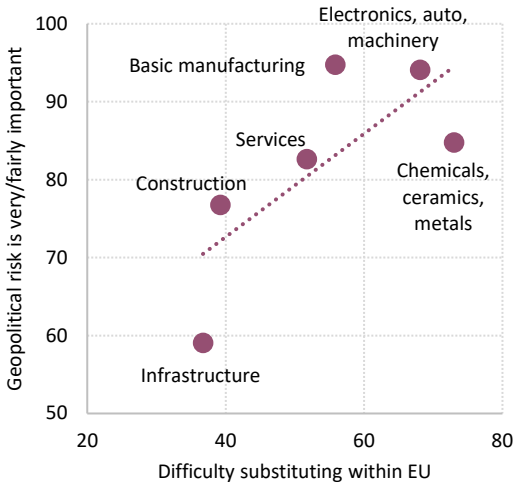


Figure 29: Geopolitical risk and difficulty substituting within the EU
(share of importers, %)



Source: EIB calculations based on the SUCH survey wave 2023. Note: Firms are weighted by value added. See note to Figure 13 for the subsector groups.

The importance of geopolitical risk and security of supply in choosing a new supplier varies across sectors. The share of firms reporting geopolitical risk and security of supply as an important factor ranges from 59% of firms in infrastructure to 95% in basic manufacturing. It is also correlated with the difficulty firms face in substituting providers (Figure 29).

Innovative and digital firms adapt better to changing circumstances and are more likely to invest in de-risking their supply chains

35% of EU importers report actively monitoring ESG (environmental, social and governance) practices of their trade partners and suppliers

Highly productive firms are more likely to increase inventory to meet demand and less likely to retrench from trade

Firms in sectors with a strong focus on climate change investments are more likely to embrace ESG practices

Finance constrained firms face heightened vulnerabilities during crises and struggle to respond effectively

When faced with a shock in input costs, firms with lower solvency are more likely to raise prices for their customers

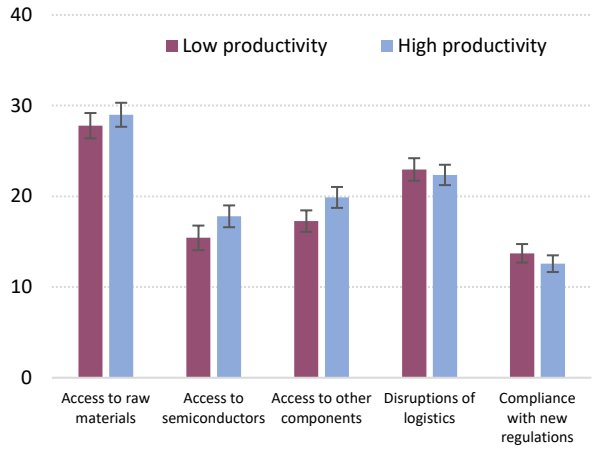
Factors driving firms' transformation for greater resilience

Beyond the nature of their trade participation, firms' capacity to adjust to trade disruption is influenced by firm characteristics like productivity, innovation and management practices. This section explores how innovative firms, highly productive firms and better managed firms respond to trade disruptions. It shows that these firms are more likely to be affected by supply chain disruptions, as they are more engaged in external trade. However, they are also more likely to react by de-risking their supply chain, in particular by investing in digital tracking and diversifying their trading partners.

Highly productive firms are more likely to increase stocks and less likely to reduce imports

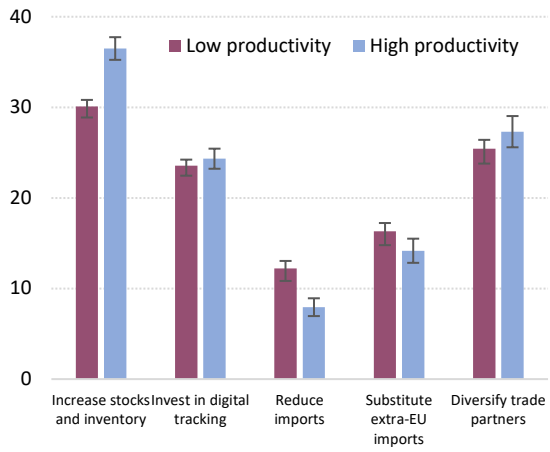
Highly productive firms are not immune to supply chain disruptions. According to the EIBIS, they are more likely to report access to semiconductors and access to other components as obstacles to their activities (Figure 30). Highly productive firms show discernible behaviours in response to supply chain disruptions. Compared to low-productivity firms, they are more likely to increase stocks to enhance their capacity to meet demand efficiently (Figure 31). They are also less inclined to retrench from trade. Using imported inputs can be the source of a firm's competitive edge and higher productivity (Halpern et al., 2015).

Figure 30: Probability of experiencing major trade disruptions, by productivity level
(estimated probabilities, %)



Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023. Note: The figure shows estimated coefficients from five different logistic regressions, evaluated at the first and last decile of the labour productivity distribution, where the dependent variable is a major trade disruption (for example, access to raw materials). The regressions control for firm size, trade status, country and sector. Confidence intervals at 10% significance level.

Figure 31: Probability of responding to trade disruptions, by productivity level
(estimated probabilities, %)

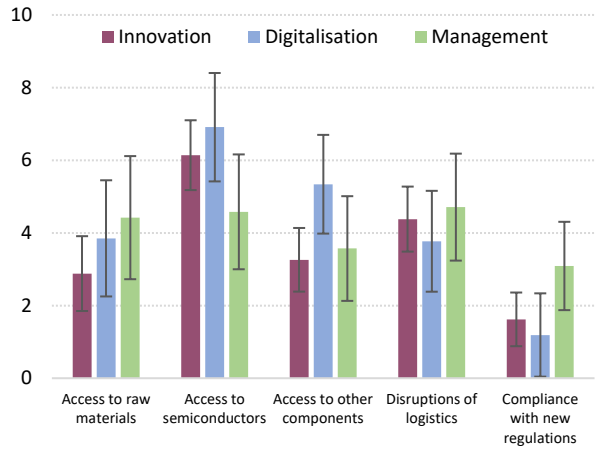


Source: EIB calculations based on the SUCH survey using the EIBIS sample of wave 2023. Note: The figure shows estimated coefficients from five different logistic regressions, evaluated at the first and last decile of the labour productivity distribution, where the dependent variable is a response to trade disruptions (for example, increasing stock and inventory). The regressions control for trade obstacles, firm size, trade status, country and sector. Confidence intervals at 10% significance level.

Innovative and digital firms invest in inventory management and diversification

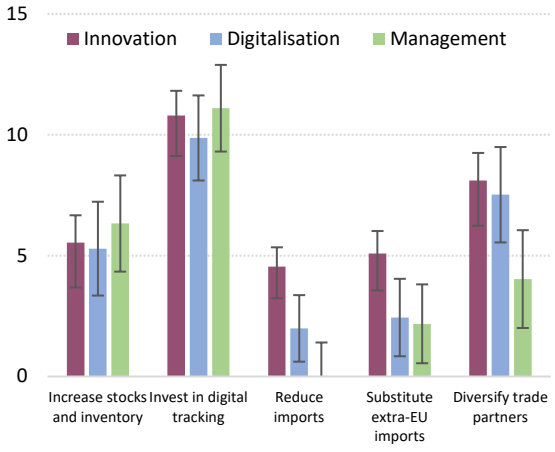
Innovative firms encounter distinct challenges during trade disruptions. Their stronger reliance on advanced technologies and novel products makes them particularly sensitive to trade disruptions. This may be at least partially driven by their technology-driven processes, which rely more on trade. Digital firms, like innovators, also show higher vulnerability to supply change disruptions. Furthermore, better managed firms are more likely to export, sell more products to more destinations, and import a wider range of inputs from different countries (Bloom et al., 2021). When supply chain disruptions arise, innovators, digital and better managed firms tend to flag a more pronounced impact (Figure 32). For example, innovative firms, firms using advanced digital technologies or those using strategic business monitoring systems are more likely to report that access to microchips and semiconductors is an obstacle to their activities. Compared to less advanced firms, they are also more likely to report that disruptions in logistics access to raw materials and other components significantly affect their operations.

Figure 32: Difference in the probability of experiencing major trade disruptions for innovative firms, digital firms and firms adopting strategic management practices
(difference in probability, percentage points)



Source: EIB estimates based on EIBIS and SUCH surveys, wave 2023. Note: The first bar in the figure shows the estimated coefficient on innovation status in an OLS regression where the dependent variable is a major trade disruption (for example, access to raw materials). The regressions are estimated separately for each trade disruption. Similar regressions are estimated using digital status and the use of management practices as the main explanatory variable. Innovation: positive investment in the development of new products, processes or services in the previous financial year. Digital: use of digital technologies within the business. Management practices: use of a formal strategic business monitoring system. The regressions control for firm size, trade status, country and sector. Confidence intervals at 10% significance level.

Figure 33: Difference in the probability of responding to trade disruptions for innovative firms, digital firms and firms adopting strategic management practices
(difference in probability, percentage points)



Source: EIB estimates based on EIBIS and SUCH surveys, wave 2023. Note: The first bar in the figure shows the estimated coefficient on innovation status in an OLS regression where the dependent variable is a response to trade disruptions (for example, increasing stock and inventory). The regressions are estimated separately for each response to trade disruption. Similar regressions are estimated using digital status and the use of management practices as the main explanatory variable. The regressions control for trade obstacles, firm size, trade status, country and sector. Confidence intervals at 10% significance level.

Innovative firms, digital firms and better managed firms exhibit remarkable adaptability to changing circumstances, enhancing their capacity to remain competitive. These firms optimise their supply chains by investing in digital tracking, diversification and increasing inventory (Figure 33). By proactively addressing challenges, they mitigate the impact of disruptions and position themselves for

resilience. These firms recognise the importance of maintaining buffer inventory stocks and create a safety net against supply chain disruptions. Their focus on efficient inventory management ensures that they can meet demand even when faced with challenges. Interestingly, innovative firms are more likely to report that they substitute extra-EU imports with EU suppliers or reduce imports. This suggests that they also invest to develop new business models and reduce dependencies to adapt to changing external conditions. In this context, Box B discusses EU firms' responses to changes in ESG regulation.

Box B: Firms' responses to changes in ESG regulation

EU firms are undergoing a transformation driven by environmental, social and governance (ESG) considerations. As companies recognise their role in shaping a sustainable future, they are increasingly focused on monitoring and improving their practices. In recent years, policymakers have put in place different regulations to ensure implementation of ESG considerations. This box delves into the implications of ESG regulation for firms' supply chains, more precisely the EU legislative proposal suggesting that companies would be held responsible for the environmental and social conduct of their trading partners and suppliers.

When queried about the potential impact of being held responsible for the environmental and social conduct of trading partners and suppliers, 35% of EU importers respond that they are already actively monitoring environmental and social conduct. According to SUCH, the proposed change in legislation would have no significant impact on these companies' existing practices, at least for a part of their supply chain (Figure B1). A third of firms (32%) plan to implement necessary changes related to the potential ESG regulation themselves. A fifth of firms (20%) indicate that they would rely on a third party to monitor environmental and social conduct and provide certificates. 18% of EU importers indicate that they would cut at least some supplies from certain countries.

Larger firms report being better prepared than SMEs for compliance with ESG regulations. The organisational capacity of large firms allows them to make internal adjustments, and many are already in compliance with ESG standards. Smaller firms, on the other hand, face unique challenges. While they share the same ESG goals and regulation, resource constraints may hinder their ability to implement changes independently. Smaller companies may struggle to allocate resources for ESG-related adjustments. As a result, they are more likely to consider alternative approaches, such as relying on third-party services for monitoring and certification, or cutting supplies from certain countries (Figure B2).

Figure B1: Responses to changes in ESG regulation
(share of importers, %)

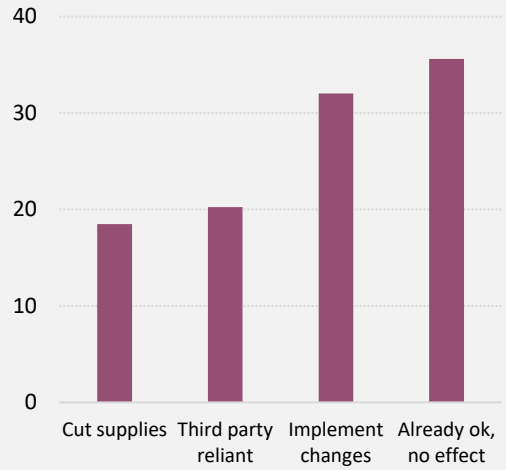
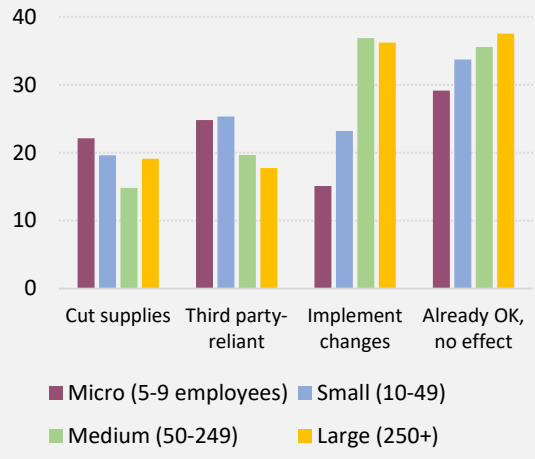


Figure B2: Responses to changes in ESG regulation, by firm size
(share of importers, %)



Source: EIB calculations based on the SUCH survey wave 2023. Note: Firms are weighted by value added.

Firms in sectors with a strong focus on climate change investment are more likely to embrace ESG changes (Figure B3). They are also less inclined to express reluctance to make the changes suggested in light of the regulatory development (Figure B4) This indicates that sectors that have a more transformative mindset, in which green investment is a higher priority, may also be more likely to follow ESG standards and adapt to regulatory shifts.

Figure B3: Green investment and willingness to implement changes in ESG regulation
(share of importers, %)

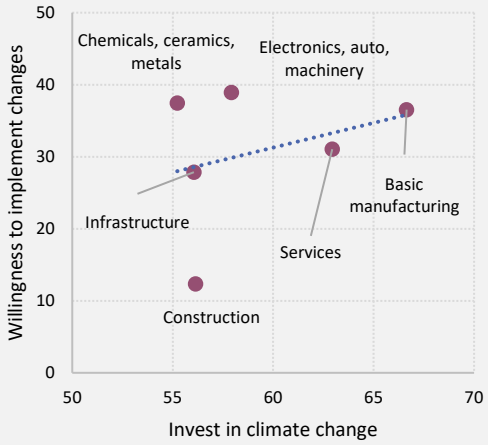
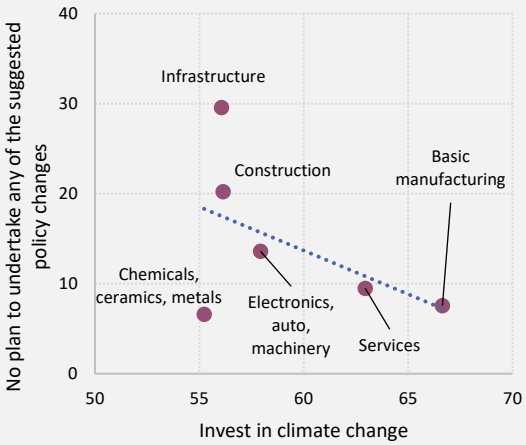


Figure B4: Green investment and no plan to respond to changes in ESG regulation
(share of importers, %)



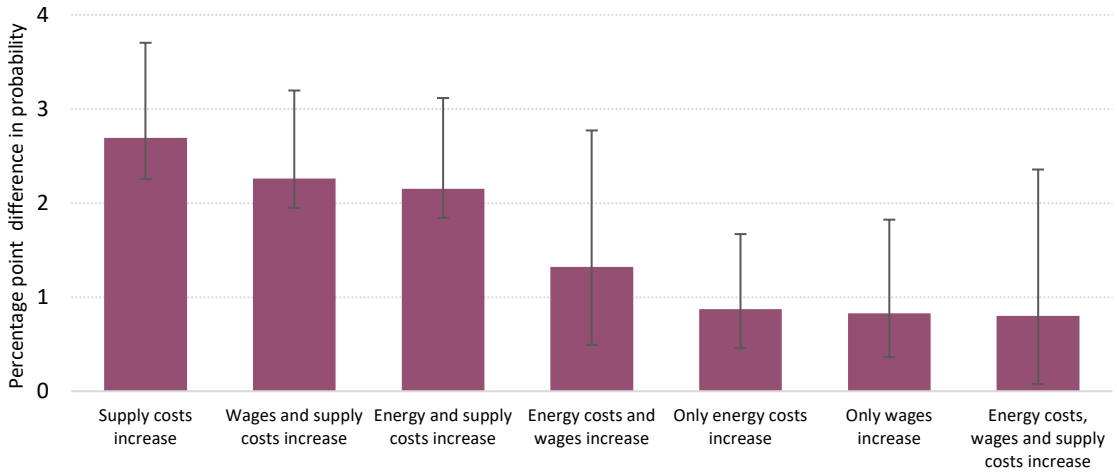
Source: EIB calculations based on the SUCH survey wave 2023 and EIBIS wave 2023. Note: Firms are weighted by value added. Investing in climate change: Firms that invest to deal with the impacts of weather events and reduce carbon emissions. See note to Figure 13 for the subsector groups.

The role of access to finance

Trade disruptions alter the way firms respond to an increase in operational costs. The operational costs considered here include energy costs, gross wages and the price of the goods or services the firm purchases. Cost-push shocks and firms' financial characteristics interact to influence their pricing strategies and how they pass on changes in costs to final customers. In general, firms are more likely to adjust their prices when the cost of intermediate inputs increases (Lafrogne-Joussier et al., 2023b). However, firms with lower financial constraints are less likely to pass on changes in costs quickly, especially when they are affected by fewer cost-push shocks.

Firms with lower solvency ratios (which can be considered weaker firms) need to pass on costs more quickly when facing trade disruptions. Solvency ratio can be defined as the ratio of shareholders' funds to total assets. When firms are hit by a shock in supply costs, those with lower solvency are more likely to increase the price they charge to customers (Berardi, 2024). According to SUCH, the main reason for passing costs to customers by firms with lower solvency appears to be a rise in suppliers costs, rather than in wages or in energy costs (Figure 34). It is likely that tighter access to external finance stops them from absorbing as much shock as stronger firms can. The increase in the speed of cost pass-through can have direct implications for macroeconomic variables in the economy, such as inflation and, ultimately, disposable income for households.

Figure 34: Difference in the probability of passing on costs to customers between firms with low solvency and high solvency, by type of input costs
(difference in probability, percentage points)



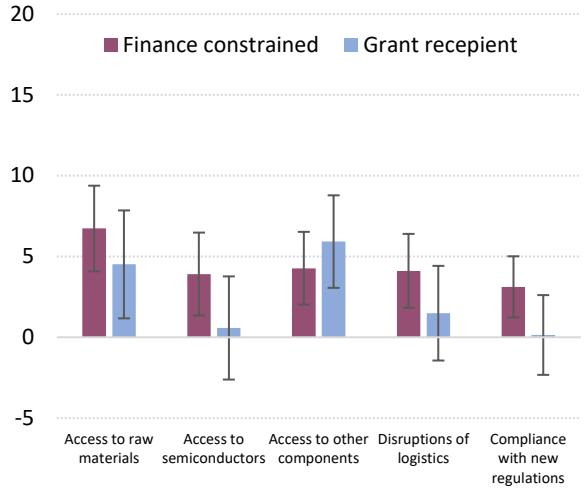
Source: EIB estimates based on the SUCH survey wave 2023 and Orbis. Note: The figure shows the difference in estimated coefficient from logistic regressions, where the dependent variable is whether firms report having increased the prices they charge their customers. The logistic regressions are estimated separately for each cost category, and separately for firms with high solvency and low solvency, and are compared with firms not facing trade disruptions. Solvency is defined using the ratio of shareholders' funds to total assets and is based on information from the balance sheets of the firms in Orbis. Low solvency: first quartile of the solvency distribution; high solvency: top quartile of that distribution. The regressions control for trade obstacles, firm size, country and sector. Confidence intervals at 10% significance level.

Firms constrained by limited access to external finance face heightened vulnerabilities during crises and struggle to respond effectively. According to the EIBIS, EU importers that are finance constrained are more likely to report that trade disruptions are a serious obstacle to their activities (Figure 35). Although disruptions are stronger for finance-constrained firms, these firms do not have a stronger ability to respond effectively (Figure 36). Resource constraints are likely to prevent investment in risk adjustment measures.

Policy support through grants or subsidies can make a difference in enhancing firm resilience. Companies that receive grants are more likely to report having been affected by access to raw materials and access to other components.[10] However, grant recipients are also much more likely to respond to trade disruptions.[11] They tend to increase stocks and inventory and invest in digital tracking. Compared to EU importers that do not receive grants, they are much more likely to diversify or increase the number of countries they import from. The additional financial buffer may allow them to explore new markets, products or services from suppliers in different countries. Interestingly, firms receiving grants are also reportedly more likely to substitute imports from outside the EU with suppliers from within the EU. This diversification can act as a buffer against external shocks, fostering long-term sustainability. Cross-country diversification has also been proven to dampen macroeconomic volatility at country level (Caselli et al. 2020; Baldwin and Freeman 2022).

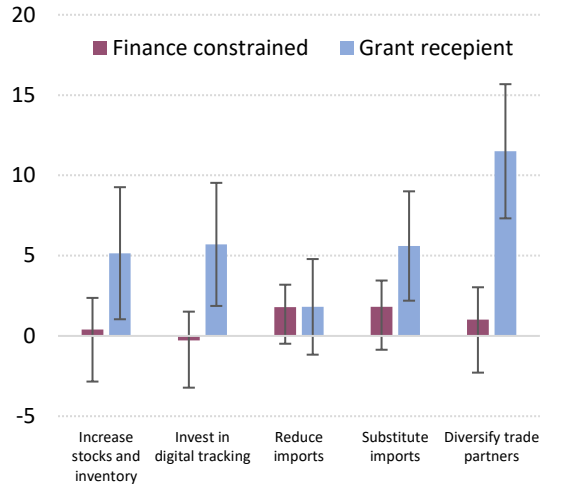
[10] For EIBIS 2023, grants are financial support or subsidies from regional and national government and funding provided by the European Commission that do not have to be repaid.
[11] Grants and subsidies are often designed to support importers or exporters, which may explain why grant recipients are more affected by limited access to raw materials or other components and are more likely to respond to trade disruptions.

Figure 35: Difference in the probability of experiencing major trade disruptions, for finance-constrained firms and grant recipients
(difference in probability, percentage points)



Source: EIB estimates based on EIBIS and SUCH surveys, wave 2023. Note: The first bar in the figure shows the estimated coefficient on finance constrained status in an OLS regression where the dependent variable is a major trade disruption (for example, access to raw materials). The regressions are estimated separately for each trade disruption. Similar regressions are estimated using the use of grants as the main explanatory variable. The regressions control for firm size, trade status, country and sector. Confidence intervals at 10% significance level.

Figure 36: Difference in the probability of responding to trade disruptions, for finance-constrained and grant recipients
(difference in probability, percentage points)



Source: EIB estimates based on EIBIS and SUCH surveys, wave 2023. Note: The first bar in the figure shows the estimated coefficient on finance constrained status in an OLS regression where the dependent variable is a response to trade disruptions (for example, increasing stock and inventory). The regressions are estimated separately for each response to trade disruptions. Similar regressions are estimated using grants as the main explanatory variable. The regressions control for trade obstacles, firm size, trade status, country and sector. Confidence intervals at 10% significance level.

Conclusion and policy messages

Over the past decades, Europe has become deeply integrated into world trade and global production networks. More recently, international trade has undergone significant shifts, shaped by the change in globalisation patterns and a series of crises – trade tensions between the US and China, the COVID-19 pandemic, the shortage of key strategic inputs, rising shipping costs, the Russian military aggression against Ukraine and the energy crisis. These disruptions have uncovered strategic vulnerabilities in global supply chains and dependencies in EU imports, in a context of rising geopolitical tensions.

This report assesses this reconfiguration of international trade and investigates how EU firms navigate the underlying challenges. There have been important structural changes in the share of the EU's top trading partners. For example, imports from the UK have decreased due to Brexit. EU trade with Russia has plummeted as a consequence of Russia's full-scale invasion of Ukraine, and an ongoing strategy of sanctions and decoupling from Russia. At the same time, the EU continues to be highly reliant on trade with China and the US. Unlike in the EU, China's share in US imports has declined, driven by the increase in tariffs on specific products. Nevertheless, the rebalancing of US imports towards other countries, such as Mexico and Viet Nam, may not have decreased its dependence on China. Countries from which US imports have increased in turn increased their imports from China, leading to indirect vulnerabilities.

The analysis presented in this report stresses that disruptions in logistics and transport and restricted access to commodities and raw materials (steel, copper, fossil fuels, lithium, etc.), semiconductors and other components have become major obstacles to the operations of EU firms. Manufacturing firms in the subsectors of electronics and machinery – and to some extent in chemicals (including pharmaceuticals), ceramic and metals – report having been hit especially hard by inputs shortages. Firms importing only from one or two countries outside the EU have also been disproportionally affected, which highlights the dependencies that can emerge due to import concentration.

EU firms have demonstrated remarkable agility in addressing recent supply chain disruptions, using multifaceted responses – for example, by increasing stocks and inventory, investing in digital inventory and inputs tracking, and diversifying or increasing the number of countries they import from. The focus appears to be on adjustment strategies and supplier diversification, and not entrenchment or disengagement from global value chains.

So far, only a small share of EU firms views recent changes in customs and tariffs as a major obstacle to their activities. Compliance with new regulations, standards or certifications is cited even less often as a barrier. EU importers were mainly affected by access to inputs and disruptions of logistics and transport, on the back of rising shipping costs. The responses to these disruptions focused on inventory management and diversification. However, the nature and severity of trade barriers may shift if geopolitical tensions escalate, for example in the context of trade relations between the US and China.

European policymakers are responding to these challenges by helping firms reduce import dependencies, build on the strength of the EU single market and rely on Europe's resources in key strategic areas, while also maintaining strong ties and cooperation with global production networks. Under its open strategic autonomy approach, and in strengthening its economic security, the EU has implemented a series of policy measures in recent years, including the Critical Raw Materials Act, the European Chips Act and the Net-Zero Industry Act. This will enhance the EU's access to a secure,

diverse and sustainable supply of key strategic inputs, reinforce its ability to produce advanced technologies used in industrial value chains, and improve its competitiveness and energy resilience. In an era in which Europe's strategic position may be at risk, the EU remains steadfast in its commitment to preserving the advantages of trade integration while simultaneously promoting diversification, resilience and innovation within the single market.

As specific disruptions propagate along global value chains and compound the pressure on EU firms, well-targeted policies, rather than a one-size-fits-all approach, are required. This is particularly important because some firms may be unaware of their original dependencies. Monitoring externalities is thus an important aspect of managing trade disruptions. So far, EU companies involved in global production networks have shown agility and the ability to transform in response to recent supply chain disruptions. To strengthen EU competitiveness, it is crucial to equip them with predictable framework conditions and the finance they need to diversify their trade partners and invest in innovation. This will help ensure that the EU can accelerate the twin green and digital transitions.

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Appendix: Survey questions used in the figures

Questions from EIBIS 2023 and SUCH Survey 2023 used in the figures of the report:

Figure 8	Q. Since the beginning of 2022, were any of the following an obstacle to your business's activities? Is it a major obstacle, a minor obstacle or not an obstacle at all? A. Access to commodities or raw materials (e.g. steel, copper, fossil fuels, lithium, etc.). B. Access to semiconductors and microchips. C. Access to other components, semi-finished products, services or equipment. D. Disruptions of logistics and transport. E. Compliance with new regulations, standards or certifications. F. Recent changes in customs and tariffs. Q. In 2022, did your company export or import goods and/or services? A. Yes, exported goods and/or services. B. Yes, imported goods and/or services. C. Yes, exported and imported goods and/or services. D. No, did not import or export goods and/or services.
Figure 9	Q. Thinking about your investment activities, to what extent is each of the following an obstacle? Is it a major obstacle, a minor obstacle or not an obstacle at all? A. Demand for products or services. B. Availability of staff with the right skills. C. Energy costs. D. Access to digital infrastructure. E. Labour market regulations. F. Business regulations (e.g. licences, permits, bankruptcy) and taxation. G. Availability of adequate transport infrastructure. H. Availability of finance. I. Uncertainty about the future. Q. In 2022, did your company export or import goods and/or services? A. Yes, exported goods and/or services. B. Yes, imported goods and/or services. C. Yes, exported and imported goods and/or services. D. No, did not import or export goods and/or services.
Figure 10	Q. Since the beginning of 2022, were any of the following an obstacle to your business's activities? Is it a major obstacle, a minor obstacle or not an obstacle at all? A. Access to commodities or raw materials (e.g. steel, copper, fossil fuels, lithium, etc.). B. Access to semiconductors and microchips. C. Access to other components, semi-finished products, services or equipment. D. Disruptions of logistics and transport. E. Compliance with new regulations, standards or certifications. F. Recent changes in customs and tariffs. Q. In 2022, did your company export or import goods and/or services? A. Yes, exported goods and/or services. B. Yes, imported goods and/or services. C. Yes, exported and imported goods and/or services. D. No, did not import or export goods and/or services.
Figure 11	Q. In 2022, did your company export or import goods and/or services? A. Yes, exported goods and/or services. B. Yes, imported goods and/or services. C. Yes, exported and imported goods and/or services. D. No, did not import or export goods and/or services.
Figure 12	Q. Since the beginning of 2022, were any of the following an obstacle to your business's activities? Is it a major obstacle, a minor obstacle or not an obstacle at all? A. Access to commodities or raw materials (e.g. steel, copper, fossil fuels, lithium, etc.). B. Access to semiconductors and microchips. C. Access to other components, semi-finished products, services or equipment. D. Disruptions of logistics and transport. E. Compliance with new regulations, standards or certifications. F. Recent changes in customs and tariffs.
Figure 13	Q. Since the beginning of 2022, were any of the following an obstacle to your business's activities? Is it a major obstacle, a minor obstacle or not an obstacle at all? A. Access to commodities or raw materials (e.g. steel, copper, fossil fuels, lithium, etc.). B. Access to semiconductors and microchips. C. Access to other components, semi-finished products, services or equipment. D. Disruptions of logistics and transport. E. Compliance with new regulations, standards or certifications. F. Recent changes in customs and tariffs.
Figure 14	Q. Since the beginning of 2022, were any of the following an obstacle to your business's activities? Is it a major obstacle, a minor obstacle or not an obstacle at all? A. Access to commodities or raw materials (e.g. steel, copper, fossil fuels, lithium, etc.).
Figure 15	Q. Since the beginning of 2022, were any of the following an obstacle to your business's activities? Is it a major obstacle, a minor obstacle or not an obstacle at all? A. Access to commodities or raw materials (e.g. steel, copper, fossil fuels, lithium, etc.). B. Access to semiconductors and microchips. C. Access to other components, semi-finished products, services or equipment. D. Disruptions of

logistics and transport. E. Compliance with new regulations, standards or certifications. F. Recent changes in customs and tariffs.

Q. In 2022, did your company export or import goods and/or services? A. Yes, exported goods and/or services. B. Yes, imported goods and/or services. C. Yes, exported and imported goods and/or services. D. No, did not import or export goods and/or services.

Q. Which countries does your company source or buy products and/or services from?

Figure 16

Q. Since the beginning of 2022, has your company made or are you planning to make any of the following changes to your sourcing strategy? A. Increasing stocks and inventory. B. Investing in digital inventory and inputs tracking that allows you to track goods through the supply chain and delivery to your premises. C. Reducing the share of goods or services imported. D. Reducing imports from outside the EU and substituting with imports from within the EU. E. Diversifying or increasing the number of countries you import from. F. None of the above.

Figure 17

Q. Since the beginning of 2022, were any of the following an obstacle to your business's activities? Is it a major obstacle, a minor obstacle or not an obstacle at all? A. Access to commodities or raw materials (e.g. steel, copper, fossil fuels, lithium, etc.). B. Access to semiconductors and microchips. C. Access to other components, semi-finished products, services or equipment. D. Disruptions of logistics and transport. E. Compliance with new regulations, standards or certifications. F. Recent changes in customs and tariffs.

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Q. In 2022, did your company export or import goods and/or services? A. Yes, exported goods and/or services. B. Yes, imported goods and/or services. C. Yes, exported and imported goods and/or services. D. No, did not import or export goods and/or services.

Q. Which countries does your company source or buy products and/or services from?

Figure 19

Q. Since the beginning of 2022, has your company made or planned to make any of the changes listed below to your sourcing strategy? A. Increasing stocks and inventory. B. Investing in digital inventory and inputs tracking that allows you to track goods through the supply chain and delivery to your premises. C. Reducing the share of goods or services imported. D. Reducing imports from outside the EU and substituting with imports from within the EU. E. Diversifying or increasing the number of countries you import from. F. None of the above.

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Figure 22

Q. Are any of the goods or services that you source tailor-made for your company (meaning that the goods or services are only made or provided for you by your suppliers based upon your specific requirements)? A. Yes. B. No.

Q. How many people does your company employ either full or part time at all its locations, including yourself? Please include freelancers working regularly for your company. Full-time and part-time employees should each count as one employee. Employees working less than 12 hours per week should be excluded. Please tell us the number of people employed on 1 January 2023.

Figure 23

Q. Are any of the goods or services that you source tailor-made for your company (meaning that the goods or services are only made or provided for you by your suppliers based upon your specific requirements)? A. Yes. B. No.

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Figure 25

Q. Are any of the goods or services that you source tailor-made for your company (meaning that the goods or services are only made or provided for you by your suppliers based upon your specific requirements)? A. Yes. B. No.

Q. What type of contractual relationships does your company have with the suppliers you buy products and/or services from? A. My company owns at least part of one or more of our suppliers. B. My company procures via an intermediary (an intermediary is an individual or company that acts as a middleman between businesses) rather than directly from suppliers.

Figure 26

Q. Which countries does your company source or buy products and/or services from?

Q. If your imports (goods or services) were not available in the immediate future for one reason or another, how easy or difficult would it be for your company to find an alternative supplier? Would it be very easy, fairly easy, neither easy nor difficult, fairly difficult, or very difficult? A. In the same country as your current supplier. B. In another country outside EU. C. In another country within the EU. D. In your own country.

Figure 27

Q. Which countries does your company source or buy products and/or services from?

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Figure 28

Q. Thinking of the goods or services that you import, if you were to choose a new supplier, how important would each of the following be? Would it be very important, fairly important, not very important, or not important at all? A. Price of the goods or services bought from the new supplier. B. Business environment of the country of the new supplier. C. Distance, delivery costs and delivery time. D. Customs and tariffs. E. Geopolitical risk and security of supply. F. Quality and/or standards provided by the new supplier.

Figure 29

Q. Thinking of the goods or services that you import, if you were to choose a new supplier, how important would each of the following be? Would it be very important, fairly important, not very important, or not important at all? E. Geopolitical risk and security of supply.

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Figure 30

Q. What was the approximate turnover of your company in 2022? This is the total amount received in respect of sales of goods and services.

Q. Taking into account all sources of income in 2022, did your company generate a profit or loss before tax, or did you break even? A. Profit. B. Loss. C. Break even.

Q. Approximately how much profit/loss before tax did you make as a percentage of your turnover?

Q. How many people, including yourself, does your company employ either full or part time at all its locations? Please include freelancers working regularly for your company. Full-time and part-time employees should each count as one employee. Employees working less than 12 hours per week should be excluded. Please tell us the number of people employed on 1 January 2023.

Q. Since the beginning of 2022, were any of the following an obstacle to your business's activities? Is it a major obstacle, a minor obstacle or not an obstacle at all? A. Access to commodities or raw materials (e.g. steel, copper, fossil fuels, lithium, etc.). B. Access to semiconductors and microchips. C. Access to other components, semi-finished products, services or equipment. D. Disruptions of logistics and transport. E. Compliance with new regulations, standards or certifications. F. Recent changes in customs and tariffs.

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Q. Did you invest in 2022 to develop or introduce new products, processes or services with the intention of maintaining or increasing your company's future earnings?

Q. To what extent, if at all, are each of the following digital technologies used within your business? Is not used in the business, used in parts of the business, or the entire business is organised around this technology? A. 3D printing (also known as additive manufacturing). B. Augmented or virtual reality. C. Automation via advanced robotics. D. Big Data analytics and artificial intelligence. E. Drones. F. Digital platform technologies. G. The Internet of Things (IoT).

Q. Does your company use a formal strategic business monitoring system that compares the firm's current performance against a series of strategic key performance indicators? A. Yes. B. No.

Figure 33

Q. Since the beginning of 2022, has your company made or are you planning to make any of the following changes to your sourcing strategy? A. Increasing stocks and inventory. B. Investing in digital inventory and inputs tracking that allows you to track goods through the supply chain and delivery to your premises. C. Reducing the share of goods or services imported. D. Reducing imports from outside the EU and substituting with imports from within the EU. E. Diversifying or increasing the number of countries you import from. F. None of the above.

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Figure 34

Q. Since the beginning of 2022, how have each of the following changed for your company? Did it decrease, stay around the same, or increase? A. Energy costs. B. Gross wages, including all benefits and benefits in kind (i.e. including various types of non-wage compensation provided to employees in addition to their normal wages or salaries). C. The price of the goods or services your company purchases. D. The price your company charges customers for products and/or services.

Figure 35

Q. Since the beginning of 2022, were any of the following an obstacle to your business's activities? it a major obstacle, a minor obstacle or not an obstacle at all? A. Access to commodities or raw materials (e.g. steel, copper, fossil fuels, lithium, etc.). B. Access to semiconductors and microchips. C. Access to other components, semi-finished products, services or equipment. D. Disruptions of logistics and transport. E. Compliance with new regulations, standards or certifications. F. Recent changes in customs and tariffs.

Q. Did you use grants for your investment activities in 2022? Grants are financial support or subsidies from regional and national government and funding provided by the European Commission that do not have to be repaid.

Figure 36

Q. Since the beginning of 2022, has your company made or are you planning to make any of the following changes to your sourcing strategy? A. Increasing stocks and inventory. B. Investing in digital inventory and inputs tracking that allows you to track goods through the supply chain and delivery to your premises. C. Reducing the share of goods or services imported. D. Reducing imports from outside the EU and substituting with imports from within the EU. E. Diversifying or increasing the number of countries you import from. F. None of the above.

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Figure B1

Q. There is an EU legislative proposal under which companies would be held responsible for the environmental and social conduct of their trading partners and suppliers. If the proposal were adopted, which of the following would apply to your company? A. My company would cut supplies from certain countries. B. My company would implement all necessary changes to its current monitoring/certification process itself. C. My company already monitors environmental and social conduct, so this would have no impact on our activities. D. My company would leave the monitoring of environmental and social conduct the provision of certificates to a third party. E. None of the above.

Figure B2

Q. There is an EU legislative proposal under which companies would be held responsible for the environmental and social conduct of their trading partners and suppliers. If the proposal were adopted, which of the following would apply to your company? A. My company would cut supplies from certain countries. B. My company would implement all necessary changes to its current monitoring/certification process itself. C. My company already monitors environmental and social

conduct, so this would have no impact on our activities. D. My company would leave the monitoring of environmental and social conduct the provision of certificates to a third party. E. None of the above.

Q. How many people does your company employ either full or part time at all its locations, including yourself? Please include freelancers working regularly for your company. Full-time and part-time employees should each count as one employee. Employees working less than 12 hours per week should be excluded. Please tell us the number of people employed on 1 January 2023.

Figure B3

Q. There is an EU legislative proposal under which companies would be held responsible for the environmental and social conduct of their trading partners and suppliers. If the proposal were adopted, which of the following would apply to your company? A. My company would cut supplies from certain countries. B. My company would implement all necessary changes to its current monitoring/certification process itself. C. My company already monitors environmental and social conduct, so this would have no impact on our activities. D. My company would leave the monitoring of environmental and social conduct the provision of certificates to a third party. E. None of the above.

Q. Which of the following applies to your company's investments to deal with the impacts of weather events and reduce carbon emissions? A. Before this year my company had already made such investments. B. My company is investing this year. C. My company intends to invest over the next three years. D. My company has no such investment planned for the next three years.

Figure B4

Q. There is an EU legislative proposal under which companies would be held responsible for the environmental and social conduct of their trading partners and suppliers. If the proposal were adopted, which of the following would apply to your company? A. My company would cut supplies from certain countries. B. My company would implement all necessary changes to its current monitoring/certification process itself. C. My company already monitors environmental and social conduct, so this would have no impact on our activities. D. My company would leave the monitoring of environmental and social conduct the provision of certificates to a third party. E. None of the above.

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