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Supply Chain Tectonics

Empirics on how the EU is plotting its path through global trade fragmentation

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ROMÁN ARJONA
WILLIAM CONNELL GARCIA
CRISTINA-DANIELA HERGHELEGIU

EUROPEAN COMMISSION

Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs
Directorate A - Strategy & Economic Analysis
Unit A.1 - Chief Economist Unit

Contact: Román Arjona, William Connell, Cristina Herghelegiu

*E-mail:*Roman.ARJONA-GRACIA@ec.europa.eu,William.CONNELL-GARCIA@ec.europa.eu,
Cristina Daniela.HERGHELEGIU@ec.europa.eu,

European Commission
B-1049 Brussels

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Román Arjona

William Connell

Cristina Herghelegiu

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Empirics on how the EU is plotting its path through global trade fragmentation

Román Arjona William Connell Cristina Herghelegiu[†]

Abstract

This paper investigates how the import relations of the European Union (EU) have recently shifted in an increasingly fragmented global trade environment. Using trade data at a highly disaggregated product level, we analyse the reallocation of EU import flows, examining its implications in terms of changes in import diversification levels and price dynamics. The timing of this analysis is important given the rising geopolitical uncertainties and the ongoing implementation of EU policies aimed at enhancing internal capacities and mitigating supply chain risks in critical supply chains. Our findings confirm that the EU's supply chains are not static entities but rather dynamic networks with a significant capacity for adaptation to the new global landscape. Despite sectoral differences, we observe a recent overall trend of EU imports shifting from countries without any bilateral trade initiative towards the EU, as well as towards neighbouring and distant partners in ongoing bilateral trade initiatives. We find that this leads to higher diversification in EU imports. However, for some products, this shift might initially focus on certain agreement partners, notably given that ramping up domestic capacity requires a period of adjustment. In addition, we show mixed evidence of associated upward pressure on prices in the short term. To conclude, this paper aims to highlight ongoing trends in EU imports, as well as some ongoing challenges related to balancing efficiency and resilience.

Keywords: European Union, trade fragmentation, supply chain reorganisation, resilience, dependencies, raw materials, semiconductors, net-zero technologies

JEL classification: L52, L60, F14, F15, F61

[†] European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SME; Avenue d'Auderghem 45, 1040 Brussels, Belgium; +32 2-299-4570; Roman.ARJONA-GRACIA@ec.europa.eu, William.CONNELL-GARCIA@ec.europa.eu, Cristina-Daniela.HERGHELEGIU@ec.europa.eu.

1. Introduction

Over the last five decades, international supply chains have gained ever-increasing attention from policymakers, academics, and business leaders due to their capacity to spur efficiency gains. Companies took advantage of sturdier capital mobility, technological leaps in logistics and telecommunications, and a global shift toward trade liberalisation, to fragment production stages across multiple locations around the world in the search of cost reduction, economies of scale, risk reduction or access to foreign inputs. In this context, the World Bank (2020) estimated that international supply chains accounted for around half of global trade in 2020. Consequently, at an aggregate level, the EU as a whole has benefited from open and integrated world markets, as well as international supply chains, both in terms of efficiency and resilience. Recently, however, events such as the COVID-19 pandemic and ongoing geopolitical tensions have enfeebled the previously optimistic outlook on global supply chains. Growing concerns about supply chain vulnerabilities have emerged, as the evolving global landscape has exposed firms and nations to greater risks of disruption, unveiling their dependencies and vulnerabilities.

In this context, the European Commission published in 2021 its new Trade Strategy and updated its Industrial Strategy.[1] Both policy documents aimed at taking into account this fast-changing global environment by enhancing the transition towards a more resilient and globally competitive EU economy. While acknowledging the benefits of open and integrated world markets in supply chains for efficiency and resilience, the adoption of an Open Strategic Autonomy approach by the European Commission raised awareness of concepts such as “exposure”, “excessive dependencies” or “strategic autonomy” within sensitive sectors of the economy.

Consequently, in this new global landscape EU public policy responses have emphasised the need for the careful consideration of risks and dependencies in critical areas. Since these two strategies were published, the EU experienced further significant supply challenges from events such as the Russian military aggression of Ukraine, the fallout of the Israel-Hamas-Hezbollah conflict or trade weaponisation strategies from countries like China and Russia. As a result, in parallel to an ongoing strategy of decoupling from Russia,[2] the concepts of “de-risking” and “economic security” were highlighted as a central EU strategy.[3,4,5]

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[1] Trade Policy Review - An Open, Sustainable and Assertive Trade Policy – COM (2021) 66; Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe’s recovery – COM (2021) 350.

[2] See for instance the Sanctions adopted following Russia’s military aggression against Ukraine - European Commission (europa.eu). In this context, Di Comite and Pasimeni (2023) study the massive adjustment taking place to decouple from Russia for the EU economy.

[3] 2023 State of the Union Address by President von der Leyen, available at: https://ec.europa.eu/commission/presscorner/detail/en/speech_23_4426. Consulted on May 31, 2024.

[4] “Joint Communication to the European Parliament, the European Council and the Council on “European Economic Security Strategy” - JOIN(2023) 20 final.

[5] EU competitiveness: Looking ahead (“Draghi Report”): EU competitiveness: Looking ahead - European Commission (europa.eu).

This paper contributes to the ongoing debate of the implications of the aforementioned shocks that are affecting EU supply chains and the ongoing economic strategies to respond to them. In particular, we explore whether the EU is witnessing initial evidence of reorganisation in its supply chains, against the backdrop of new geopolitical forces at work in international trade. The paper also examines the implications of these adjustments in the global architecture of supply chains on import concentration and import price dynamics. Besides analysing these trends for all products imported by the EU, one novelty of the paper is that it also investigates specific supply chains, which can be considered as sensitive for the EU economy and industry. The sensitive areas covered in this paper include critical raw materials, products within the supply chain of semiconductors and net-zero technologies, all of which are part of ongoing EU policy initiatives.[6] Additionally, we consider a list of products across various sensitive sectors characterised by high levels of EU's foreign dependencies. Additionally, we also consider a subset of these goods whose production is dominated by a single country of origin, referred to as global single points of failure (SPOFs).[7] Throughout this paper we aim to explain the ongoing reallocation of EU imports and its potential consequences, remaining agnostic on the potential drivers behind these phenomena.[8]

In this paper, we will classify countries in four trading groups based on the current status of EU trade partnerships and the geographical proximity of countries to the EU: (1) EU27, (2) “neighbouring agreement partners”, (3) “non-neighbouring agreement partners”, and (4) “non-agreement partners”.[9]

More precisely, this paper considers as group (1) the **EU27** Member States. It then uses an initial classification of “agreement partners” to englobe countries that have trade partnerships with the EU, and this includes third countries with whom the EU shares trade agreements,[10] whether in place or provisionally applied, raw material partnerships,[11] or that are signatories of the recent 2022 Joint Statement of Cooperation on Global Supply Chains.[12] Subsequently, and using the geographical proximity of these countries to the EU, the paper splits the initial category of

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[6] Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials; Regulation (EU) 2023/1781 of the European Parliament and of the Council of 13 September 2023 establishing a framework of measures for strengthening Europe's semiconductor ecosystem and amending Regulation (EU) 2021/694)); Regulation (EU) 2024/1735 of the European Parliament and of the Council of 13 June 2024 establishing a framework of measures for strengthening Europe's net-zero technology manufacturing ecosystem and amending Regulation (EU) 2018/1724.

[7] More details on the list of sensitive supply chains are provided in Section 2. For the concept of SPOF, see Arjona et al. (2023).

[8] EU imports might be reallocating due to political risks, rising overseas labour costs, improved automation technology, sustainability goals, regulatory compliance, and the need for supply chain resilience and proximity to countries with existing agreements.

[9] A country is designated as an EU partner when it maintains active and established trade flows with the EU.

[10] EU Trade agreements (europa.eu)

[11] Raw materials diplomacy - European Commission (europa.eu)

[12] Joint Statement on Cooperation on Global Supply Chains - United States Department of State. The 2022 Joint Statement on Cooperation on Global Supply Chains was signed by Australia, Brazil Canada, Costa Rica, the Democratic Republic of the Congo, EU, India, Indonesia, Japan, Mexico, the Republic of Korea, Singapore, the United Kingdom, and the United States.

"agreement partners" into groups (2) and (3) above: "**neighbouring agreement partners**" and "**non-neighbouring agreement partners**". The "neighbouring agreement partners" group includes countries within the European Free Trade Association (EFTA), the Eastern Partnership, the Southern Neighbourhood, the Western Balkans, as well as Turkey and the UK.[13] All remaining "agreement partners", which are not included in the "neighbouring agreement partner" group, are automatically assigned to group (3) above and classified as "non-neighbouring agreement partners". The remaining countries which are not EU27 Member States and do not fall under the categories of neighbouring agreement partners nor non-neighbouring agreement partners, are labelled as group (4) above: "**non-agreement partners**".

Using these four groups of countries, we find that between 2021 and 2023, EU supply chains have shown some levels of dynamism, with overall EU imports shifting away from non-agreement partners, which include Russia and China, towards the EU27 and its – neighbouring and non-neighbouring – agreement partners. This evolution is evident not only for the aggregate imports by the EU, but also when focusing on some sensitive supply chains. Next, we evaluate the consequences of this shift in imports for import diversification and prices. We find that shifting away from non-agreement partners leads to greater import diversification for the EU, when considering all of its global partners. In parallel, for some products, we observe an increase in import concentration among the EU's agreement partners, notably given that ramping up domestic capacity requires a period of adjustment. In terms of price dynamics, our findings indicate mixed evidence, hinting to a slight upward pressure on import prices in the short-run.[14] However, in the medium term, adaptation strategies by firms could reduce the cost of resilience.[15] The evidence related to prices is also mixed when examining the price dynamics of products within various sensitive supply chains.

Our study relies on the most comprehensive and current EU trade statistics from Eurostat-Comext, with data coverage extending through the latest complete year, 2023.[16] The main advantage of this database is that it allows to evaluate the recent reorganisation of EU supply chains at a highly disaggregated trade product level. Given that most policy actions highlighted in this paper are recent, this paper remains agnostic on the actual full impact of these policy initiatives on EU supply chains. However, the highlighted results can be interpreted as a reaction of EU firms and consumers to several EU and national strategies, as well as to external shocks that affected their previous behaviour.

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[13] EFTA includes Iceland, Liechtenstein, Norway and Switzerland. More details about the countries that are part of the European Neighbourhood Policy, specifically those from the Eastern Partnership, Southern Neighbourhood, and Western Balkans, can be found at: https://neighbourhood-enlargement.ec.europa.eu/countries_en. Consulted on May 31, 2024.

[14] In line with Ilkova et al. (2024).

[15] EIB-European Commission (2024).

[16] This exercise could be repeated each year as a monitoring tool of potential risks among EU supply chains.

Another advantage of Eurostat-Comext is that it is a publicly accessible database, allowing the results to be easily replicated. Ideally, we would use data on value added trade over gross values (as discussed in Koopman et al., 2014 or Borin and Mancini, 2023). However, global input-output tables that detail value-added trade between countries and industries often experience significant delays and these are aggregated at broad sector levels.[17] Hence, value-added trade databases are not suitable for our objective, which is to examine developments at a granular product level since the EU introduced its Trade and Industrial Strategy in 2021.[18]

This paper contributes to the expanding body of economic literature on the reorganisation of supply chains, which has emerged in response to various recent crises and policy interventions aimed at addressing their impact. First, several papers explore, from a theoretical standpoint, the optimal policies that governments should enact in response to diverse crises, while also examining the potential implications of mitigating and anticipatory measures for international supply chains. This body of literature includes, among others, Eppinger et al. (2021), Felbermayr et al. (2023), Grossman et al. (2023), Leibovici and Santacreu (2023), Traiberman and Rotemberg (2023), Ravikumar et al. (2024), Javorcik et al. (2024). With a particular focus on the EU, Magerman and Palazzolo (2024) employ a general equilibrium framework to evaluate the effects of various EU supply chain policies on welfare, both at the EU level and across EU regions, documenting a significant variation of these effects across EU regions.

Second, with sufficient time having elapsed since the onset of various shocks, the empirical literature exploring the ex-post effects of policies aimed at enhancing resilience following these crises has also begun to expand.[19] Fabry et al. (2024) argue that despite the challenges in anticipating the impact of current global developments, strategies such as reshoring, friendshoring, and diversification of trading partnerships, pursued by countries such as China, the EU, Japan, and the United States (US), hold the potential to regionalise global supply chains. This is an argument also supported by Aiyar et al. (2023), who explore the potential economic ramifications of a policy-driven reversal of global economic integration. Furthermore, Blanga-Gubbay and Rubínová (2023) show that, since the Russian military aggression of Ukraine in 2022, trade has exhibited a growing fragmentation along geopolitical lines, suggesting the emergence of friendshoring. However, they do not see any evidence of ongoing nearshoring. Along the same lines, Gopinath et al. (2024) use gravity model estimations to highlight the ongoing reshuffling of supply chains. Their research

[17] The most up-to-date global input-output tables provide data up to 2020 (TiVA OECD, Eurostat-Figaro).

[18] Trade Policy Review - An Open, Sustainable and Assertive Trade Policy – COM (2021) 66 ; Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recovery – COM (2021) 350.

[19] Evenett et al. (2024) introduce a "New Industrial Policy Observatory" to monitor government interventions worldwide. The database indicates that numerous countries are adopting policy measures to enhance domestic capacity using various instruments, such as localisation incentives or requirements, procurement policies, foreign direct investment, export incentives or domestic subsidies, among others. The OECD QuIS project (Quantifying industrial strategies | OECD) gathers harmonised data on industrial strategies including expenditures, composition, and features of the beneficiaries, showing significant heterogeneity in policy responses, across OECD countries. Furthermore, Rotunno and Ruta (2024) describe a "tit-for-tat" dynamic, where the implementation of certain measures by a given country prompts other countries to introduce similar measures. For instance, a subsidy measure by a major economy on a particular product leads to an average 74% higher probability that another major economy targets the same product with a similar measure within 12 months.

emphasises the significant decline in economic linkages among countries belonging to distant geopolitical groups, especially since the Russian military aggression of Ukraine.

Several other recent studies in this field examine the potential reallocation of supply chains in North America. Freund et al. (2023) and Alfaro and Chor (2023) investigate the dynamics of US supply chains as a result of the US-China trade tensions,[20] and observe a reallocation of US imports from China to certain low-wage countries, like Mexico and Vietnam. Nevertheless, these nations appear to maintain strong economic ties with China, underscoring the enduring indirect exposure of the US to the Chinese market.[21] Unlike the case of the US, Van Assche & Zhou (2024) observe that there has been no significant shift in Canadian imports away from China towards lower-wage nations. Their analysis only reveals a modest substitution of Canada's imports from China with those from Vietnam and Mexico. However, following CETA, there is a noticeable move in Canadian supply chains towards EU countries at the expense of the US, particularly in downstream and capital-intensive industries.[22]

Our paper contributes to the empirical literature on supply chain reorganisation by providing a detailed product-level analysis of the reallocation patterns of EU imports since the 2021 EU trade and industrial strategies. In addition to conducting a general analysis across all products imported by the EU, we also investigate the dynamics of sensitive supply chains, which have been the focus of recent EU policy initiatives. The literature on the reorganisation of supply chains with a particular focus on the EU is limited. One example is Conteduca et al. (2024) who uncover various facts on the recent reconfiguration of global, US and EU trade flows. They argue that while there is no evidence of a broad retreat from globalisation, there are early signs of reduced EU dependencies on China. However, this decoupling appears to be heterogeneous across products, as evidenced by the stable or even growing dependencies on Chinese products essential for the green transition. Ilkova et al. (2024) examine whether the US and the euro area have adjusted their sourcing strategies since 2016, considering the influence of geopolitical tensions and the possible effects on prices. The results show that both regions have diversified suppliers, especially for imports from "geopolitically distant" countries, with modest inflation impact. Other studies that detail current sourcing strategies of firms rely on surveys. For instance, Balteanu et al. (2024) exploit a survey among companies in Germany, Italy, and Spain, as well as EU multinationals, to investigate their supply chain behaviour. A significant number of companies in Germany (40%), Italy (30%), and Spain (30%), and EU multinationals are embracing EU-shoring practices to offset risks associated with sourcing from China. However, these risk mitigation strategies are not without costs. Around

[20] For a detailed timeline of the events related to the recent US-China trade tensions, see Bown (2023), "US-China Trade War Tariffs: An Up-to-Date Chart", available at: https://www.piie.com/sites/default/files/documents/piie-chart-us-china-war-up-to-date.pdf. Consulted on May 31, 2024.

[21] In the context of the US-China trade tensions, another line of empirical research focuses on the extent to which US tariffs on Chinese goods are passed on to US consumers. This body of research indicates that the burden of price hikes has fallen on US buyers (Amiti et al., 2019; Fajgelbaum et al., 2020; Cavallo et al., 2021).

[22] CETA stands for Comprehensive Economic and Trade Agreement and is a free-trade agreement between Canada and the European Union and its member states. It has been provisionally applied since 2016.

half of large multinational companies foresee upward price pressures over the next five years, which are expected to ease as their adaptation strategies become fully implemented in the medium-term.[23] The 2024 firm-level survey by the European Investment Bank (EIB) and the European Commission,[24] which covers approximately 1100 firms across the EU, shows that EU firms have adjusted to supply chain disruptions by investing in inventory management and diversifying the countries that they trade with.

The structure of this paper is as follows. Section 2 outlines a selection of supply chains recently identified by EU policymakers as sensitive. Section 3 shows aggregate statistics on the reallocation of EU imports among its main agreement partners. Section 4 investigates the reallocation of EU imports at the product level across trading groups and its implications for import diversification and import prices. Finally, Section 5 draws concluding remarks.

2. Description of EU sensitive supply chains

This section focuses on some areas prioritised by EU policymakers since the release of the EU's 2021 trade and industrial strategies, which we are going to label as sensitive sectors.[25]

The 2021 update of the EU Industrial Strategy included a pillar on curbing **strategic dependencies**, and since then central EU policy initiatives such as the Chips Act, the Critical Raw Materials Act and the Net-Zero Industry Act have set a deliberate policy focus to reduce vulnerabilities and increase the resilience of supply chains in these areas. For this reason, the first area in this paper refers to a basket of products where the EU experiences important foreign dependencies. Since foreign dependent products bear relatively higher risks in the event of unexpected disruptions,[26] identifying and monitoring them on a regular basis can be seen as a first step towards building resilience. As part of its 2021 updated Industrial Strategy, the European Commission carried out an analysis of the EU strategic dependencies and capacities, which included a bottom-up assessment of product dependencies across sensitive economic and industrial areas, such as security and safety, health, as well as the digital and green transition. This methodology allows to identify goods which suffer from an excessive concentration on foreign sources, significant scarcity within the EU, and low possibilities for domestic substitution. Arjona et

[23] Balteanu et al. (2024) find that putting in place de-risking strategies at the firm level, while costly in the short-run, may prove helpful in the medium-term to alleviate upwards pressures on price that emerge from supply chain distress. They conclude that the overall impact of de-risking on those pressures is therefore not necessarily upward in the longer term.

[24] EIB and European Commission (2024).

[25] The areas examined in this paper are a subset of the sensitive sectors identified by the European Commission. Analysing all of the sensitive areas identified by the EU in its policy documents falls outside the scope of this paper. For instance, as part of its Economic Security Strategy, the Commission outlined ten critical technologies essential to the EU's economic security. These include advanced semiconductors, artificial intelligence (AI), quantum technologies, biotechnology, advanced connectivity, navigation and digital technologies, advanced sensing technologies, space and propulsion systems, energy, robotics and autonomous systems, as well as advanced materials, manufacturing, and recycling technologies.

[26] Benoit et al. (2022) show that, in the EU, as a result of the COVID-19 shock, products exhibiting both high import concentration from a specific source and a greater reliance on foreign sources are more likely to experience price increases.

al. (2023) updated this approach to reflect the latest data and methodological developments and identify 204 foreign dependent products in sensitive economic areas. They also propose a measure to identify the risk of Global Single Points of Failure (SPOFs) of dependent products. This measure aims at identifying products where a single exporter is central to a large number of countries within the global trade network, and where world production is concentrated in a single country.[27] A number of Member States and the European Central Bank have transposed the European Commission's methodology into their analyses of strategic dependencies.[28]

The second area concerns **raw materials**, which are central to the functioning of several global supply chains. In March 2024, the EU adopted the European Critical Raw Materials Act,[29] defining a list of critical raw materials (CRMs), which are considered important for the wider EU economy, and a list of strategic raw materials (SRMs), which are relevant in support of EU green, digital, defence and space applications and which present risks of dependencies. The focus on raw materials by policymakers is justified by their extensive range of applications and the rising global demand for some of these products such as aluminium, copper, silicon, nickel, and manganese and the concentrated supply for many of these materials. While the Act defines domestic benchmarks in terms of extraction, processing and recycling capacity, it also highlights the impossibility to be self-sufficient in many of these materials. For this reason, the Act aims, among other measures, to increase and diversify the EU's CRM supply, including by substituting the strategic raw materials. Specially, it sets a benchmark for 2030, stipulating that no more than 65% of the EU's annual consumption of any given strategic raw material should originate from any single third country. In practical terms, the Act targets to reduce the risks associated with these products by strengthening global supply chains. It also aims to continue to negotiate and implement Industrial Strategic Partnerships, as well as to develop sustainable trade and investment agreements.

A third sensitive area highlighted by EU policymakers refers to the supply chain of **semiconductors**. In mid-2023, the EU adopted the Chips Act,[30] which aims at reducing EU's vulnerabilities and dependencies on foreign actors. This is achieved by enhancing the EU's security of supply, resilience and technological sovereignty. As in the case of raw materials, microchips are pivotal for the manufacturing of current and future critical applications, including items related to work, education, entertainment, healthcare and mobility, among others. We map

[27] While this paper uses the outcome from Arjona et al. (2023), other papers looking at EU's foreign dependencies include Jaravel and Mejean (2021) or Reiter and Stehrer (2021).

[28] See, inter alia, Buysse et al. (2024) for Belgium, Almodovar et al. (2023) for Portugal, Spain's National Office of Foresight and Strategy (2023) for Spain, and Ioannou et al. (2022) for the European Central Bank.

[29] Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401252.

[30] Regulation (EU) 2023/1781 of the European Parliament and of the Council of 13 September 2023 establishing a framework of measures for strengthening Europe's semiconductor ecosystem and amending Regulation (EU) 2021/694 (Chips Act). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R1781.

the supply chain of semiconductors in the EU based on the study conducted by Bonnet and Ciani (2023), who identify products spanning across different segments of the semiconductor value chain. Among these, we also include raw materials, but equally inputs for wafers, silicon wafers, foundry inputs, equipment, as well as final products.

The final area of products that we examine is the supply chain of technologies that play a central role in addressing climate change. As in previous sensitive areas, the market of these **net-zero (NZ) technologies** is set to triple by 2030. Recognising their significance, EU policymakers have designated them as critical technologies. On 16 March 2023, the Commission presented the Net-Zero Industry Act (NZIA) with the objective to build additional domestic manufacturing capacity within the EU.[31] This goal is expected to remain central over the coming years, as attested by the Commission's President's Political Guidelines 2024-2029, which call on the development of a new Clean Industrial Deal within the first 100 days of the new European Commission mandate.[32] In particular, NZIA aims to achieve 40% of the production necessary to fulfil the EU's needs for strategic technology products by 2030. The NZ technologies covered in the paper include solar photovoltaics, wind turbines, batteries, heat pumps, electrolysers and solar thermal technologies. In order to map CN products related to these technologies, we rely on final products and their first-tier components.

In conclusion, as a response to its trade and industrial strategies released in 2021, the EU has introduced several policy initiatives that target sensitive supply chains, and it has highlighted the need to enhance the EU's open strategic autonomy to strengthen their resilience. Depending on the specific supply chain, this entails varying levels of reshoring, nearshoring and partnershoring, and expanding trade diversification. Although these Acts only came into force recently and their implementation is underway, it is important to start assessing how EU supply chains have responded since 2021 in these areas, considering the direction set by the trade and industrial strategies.

3. Descriptive analysis of EU import reallocation

This section investigates key aggregate trends in the evolution of the EU's trade flows, with a particular focus on the geographical composition of the country groups from which sourcing occurs.

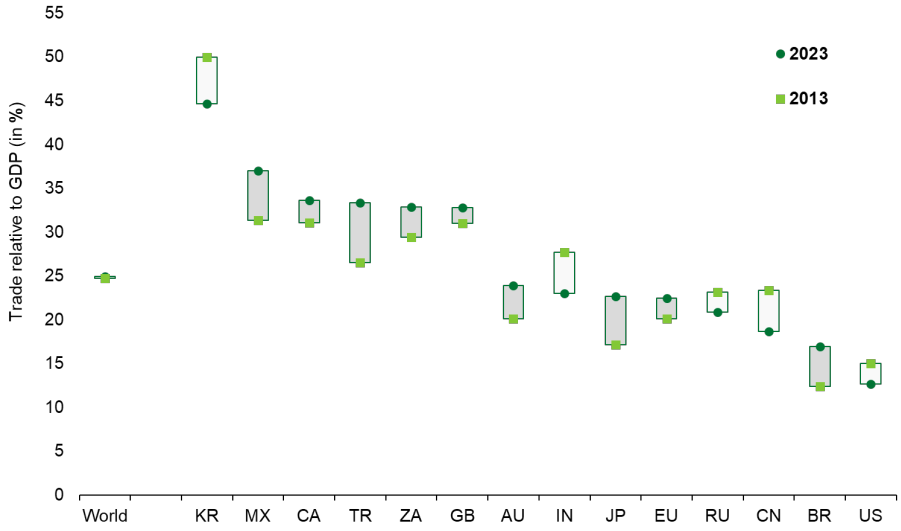
[31] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on establishing a framework of measures for strengthening Europe's net-zero technology products manufacturing ecosystem (Net Zero Industry Act) COM/2023/161 final. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:6448c360-c4dd-11ed-a05c-01aa75ed71a1.0001.02/DOC_1&format=PDF.

[32] Political guidelines for the next European Commission 2024-2029 by Ursula von der Leyen: https://commission.europa.eu/about-european-commission/towards-new-commission-2024-2029/president-elect-ursula-von-der-leyen_en.

Our objective is to provide a general overview of the "tectonics" of EU trade dynamics, setting the stage for a more granular analysis in the subsequent sections.[33]

Before examining EU supply chain dynamics, and to contextualise the analysis, we look at the evolution of trade in goods and services relative to GDP for a set of international EU partners (Figure 1). From 2013 to 2023, we observe a stagnation in the importance of trade relative to GDP at the global level. Countries such as China, India, Russia, South Korea, and the US experience a decrease in the importance of trade relative to GDP. On the other hand, the EU belongs to a group of trading entities, including Australia, Brazil, Canada, Japan, Mexico, South Africa, Turkey, and the United Kingdom (UK), where the importance of trade has increased in comparison to their respective national economies. This emphasises the EU's continuous commitment to open trade despite a changing global landscape.

Figure 1: Trade in goods and services over GDP for major trading entities in 2013 and 2023



Source: Eurostat (online data codes: bop_eu6_q and nama_10_gdp), International Monetary Fund (Balance of Payments and International Investment Position Statistics) and the World Bank (Databank – World Development Indicators). The ratio of the average value of exports and imports of goods and services to GDP is considered. The world excludes intra-EU trade and refers to 2022 instead of 2023. The EU figures exclude intra-EU trade.

The global stagnation in the relative importance of trade since 2013 has been extensively discussed and attributed in part to various shocks. These include events such as the trade tensions between the US and China, Brexit, the COVID-19 pandemic, various public policies aimed at mitigating risks within supply chains,[34] – including tariffs, export controls and other restrictions to trade –, as well as military conflicts such as the Russian aggression of Ukraine, among others. It is important to highlight, as Baldwin (2022) emphasised, that the decreasing significance of trade relative to GDP is due to the slow growth of trade in goods, partly driven by falling commodity

[33] We borrowed the reference to "tectonics" from the "plate tectonics theory", which deals inter alia with the understanding of the dynamics of the Earth's surface and the construction of its continents and oceans.

[34] See for instance the analysis by Global Trade Alert, which monitors public policies that affect global trade (link: https://www.globaltradealert.org/).

prices, while the role of services, which have become a significant part of GDP in some countries over recent decades, has expanded more rapidly.[35] Given the prominence of trade in goods within overall trade, as well as the availability of granular data for trade in goods, our analysis will primarily focus on goods.

Our data is derived from Comext,[36] Eurostat's reference database for highly disaggregated statistics on international trade in goods. The platform provides access to both recent and historical monthly bilateral trade flows for each EU Member State at the 8-digit level of the Combined Nomenclature (CN8).[37] This information is then used in different ways to serve our analytical purposes. Furthermore, while other time periods are used for robustness checks, our analysis scrutinises the period from 2010 to 2023 to capture the significant events mentioned previously (e.g., the Euro Area sovereign debt crisis, Brexit, the COVID-19 pandemic, the Russian military aggression of Ukraine). Such events challenged the resilience of EU supply chains and prompted the revision of the EU's trade and industrial strategies in 2021. Therefore, given the efforts to mitigate supply chain risks and strengthen the EU's Open Strategic Autonomy, our goal is to understand whether there are early indications of shifts in the geographical composition of import sources within EU supply chains. We use 2021 as the starting reference date for our analysis.
 presents the annual evolution of import market shares held by the EU's top 15 trading partners in total EU imports over the 2010-2023 period, highlighting in green the last 3 years, which are the main focus of our analysis. China holds a significant share of EU imports over the whole period compared to other top trading partners of the EU. Furthermore, we clearly observe the effects of various shocks on the geographical composition of EU imports over time. For instance, we witness an increase in China's share of EU imports during the COVID-19 pandemic, followed by a decline since 2021, which has brought it back to pre-pandemic levels. While this trend might indicate de-risking from China, it could also be interpreted as a normalisation of trade flows after the shock. On the other hand, the US has been gaining a larger market share of EU imports since 2021. As for Russia, it has experienced a sharp decline in its market share of EU imports following the sanctions imposed after the military aggression of Ukraine in 2022. This decline adds to another sharp decrease observed after the Russia's illegal annexation of Crimea in 2014. Furthermore, there has also been a notable decrease in the UK's share of EU imports following Brexit, with slight increases in 2022 and 2023. Simultaneously, there have been increases in import shares from countries such as India, Norway, and South Korea. These figures indicate a shifting pattern in the geographical structure of EU imports since 2021.

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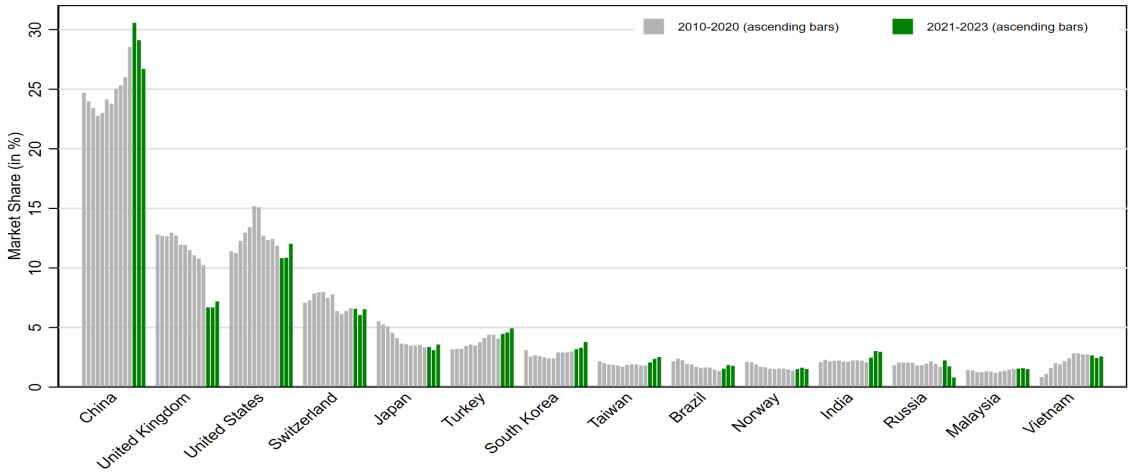
[35] For more details, see Baldwin, R. (2022), "The Peak Globalisation Myth" available at https://rbaldwin.substack.com/p/the-peak-globalisation-myth. Consulted on May 31, 2024.

[36] Note that normal imports/exports are considered for producing the results of this paper. However, the results are still robust to the inclusion of all other statistical procedures (e.g. inward/outward processing procedures).

[37] The Combined Nomenclature (CN) represents a refinement of the World Customs Organization's Harmonized System (HS) nomenclature, tailored to EU requirements. While the HS offers detailed classification up to the 6-digit level, serving as the most detailed classification globally, the CN further refines this classification to the 8-digit level, ensuring EU-focused specificity. It includes approximately 10,000 different goods.

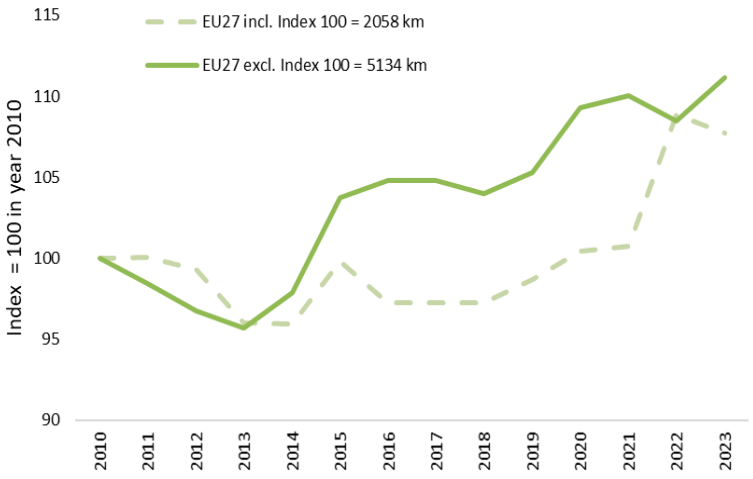
Figure 2: Evolution of market shares held by the EU's top 15 partners in total EU imports of all goods over 2010-2023



Source: Own calculations based on Eurostat-Comext. Note that energy related products have been excluded. The graph above shows the annual evolution of import market shares held by the EU's top 15 trading partners in total EU imports over the 2010-2023 period, highlighting in green the last 3 years, which are the main focus of our analysis.

Given the changing patterns in the geographical composition of EU imports, we aim to determine if imports are increasingly sourced, on average, from regions closer to the EU. Thus, in Figure 3, we examine the evolution of the average distance of EU imports over the 2010-2023 period, both with and without considering intra-EU trade flows. When intra-EU trade flows are included, the average distance of EU imports is by construction lower, reflecting the significant share of intra-EU flows in total EU imports. However, for both scenarios, with and without intra-EU flows, we observe an increase in the average distance of EU imports between 2010 and 2021, indicating no evidence of a slowdown from globalisation. While this implies that reallocation may predominantly occur among distant EU trading partners, it might also hide product heterogeneity.

Figure 3: Evolution of the average distance of EU imports of all goods over 2010-2023



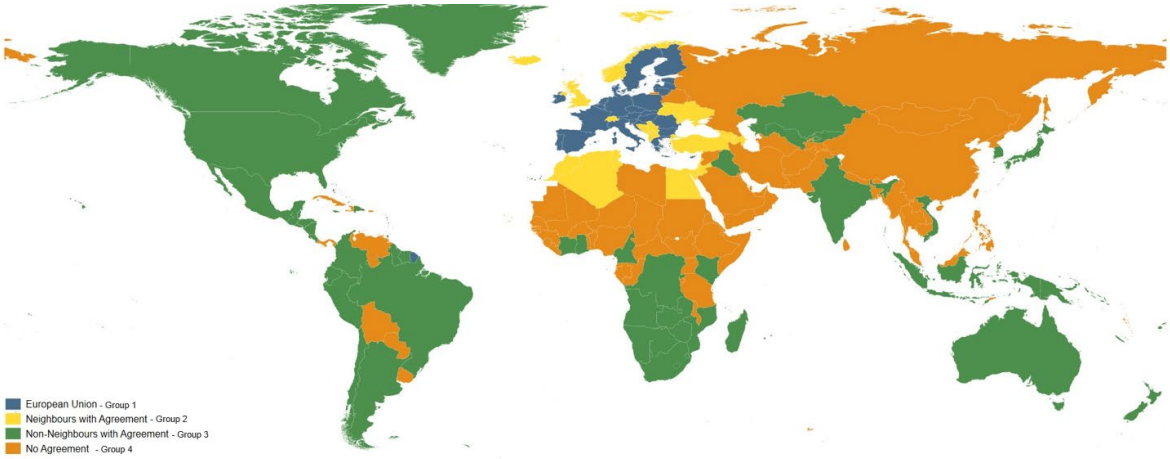
Source: Own calculations based on data from Eurostat-Comext and CEPII gravity variables. Two time series of the weighted average distance of EU imports are calculated – one including intra-EU imports and one excluding them. Weights are determined using the total import value from each specific origin in a given year. The geographical distance between the capital of the origin country and Brussels is considered when calculating the weighted average distance of extra-EU imports. Intra-EU flows are assigned a distance value of 0.

As previously highlighted, recent shocks have triggered a reassessment of supply chains across the globe by private actors. Certain countries kickstarted strategies to curb dependencies from what they consider non-like-minded partners or to secure critical inputs and goods as part of their de-risking agenda, even if it could come at the expense of shorter-term economic efficiency. These strategies include practices such as “reshoring”, which involves sourcing materials and products from the domestic market to reduce reliance on foreign suppliers and enhance local economic resilience. Another approach is “partnershoring”, which refers to sourcing from countries that share aligned principles and values for trade cooperation, thus likely to enhance supply chain stability through trusted partnerships. Under partnershoring, countries can also source from geographically closer pairs to minimise logistical complexities and transportation costs (“nearshoring”). Yet they can also source from more distant countries that, despite being further away, offer reliable and stable trade relationships. Each approach provides benefits and trade-offs, depending on the specific economic, political, and logistical contexts. Considering our previous findings, our aim is to assess more systematically how extensively these practices have recently influenced EU supply chain dynamics.

To recall that, as presented in more detail in Section 1 above, we define four country groups: (1) EU27, (2) neighbouring agreement partners, (3) non-neighbouring agreement partners, (4) non-agreement partners. Annex I displays a world map with the country classification by EU cooperation agreements that we used to define which countries fall under groups (2) and (3). It should also be reminded that countries geographically close to the EU, qualifying for group (3) (i.e., “neighbouring agreement partners”) include countries within EFTA, the Eastern Partnership, the Southern Neighbourhood, the Western Balkans, as well as Turkey and the UK. Consequently, group (2) (i.e., “non-neighbouring agreement partners”) includes all countries involved in cooperation agreements with the EU, which are not included in group (3). All countries which do not qualify for groups (1), (2) and (3), fall under group (4) as non-agreement partners. Figure 4 describes the classification of countries in these four groups, which will be used throughout the paper to understand the recent geographical reallocation of EU supply chains. To ensure the robustness of our findings, we tested alternative definitions of the EU partners. It is important to highlight that these adjustments do not significantly change the main conclusions of the paper.[38]

[38] As a robustness, we used a purely data driven approach aimed at capturing political alignment between countries. This methodology is borrowed from IRC Trade Expert Network (2024), which, in turn, builds upon the work of den Besten et al. (2023) and the classification of Capital Economics (2023). In this work, four proxies are used to capture the political alignment between countries. First, the “Sanctions Disparity” proxy is calculated as the difference between sanctions imposed by China and Russia versus those imposed by the US during the period between 1950 and 2022. The underlying data are sourced from the Global Sanction Database. Second, the “Military Imports Discrepancy” proxy measures the variance between the share of military imports from China and Russia and those from the US. The information is obtained from the SIPRI Arms Transfer Database. Third, the proxy referring to “Belt and Road Initiative Participation” assesses a country's involvement in the Belt and Road Initiative. Finally, the proxy corresponding to “Voting Behaviour on Resolutions” considers a country's voting stance on the 11th Emergency Special Session of the United Nations General Assembly on the Russian military aggression of Ukraine in March 2022. The results based on these data can be provided upon request.

Figure 4: Distribution of countries in trading groups

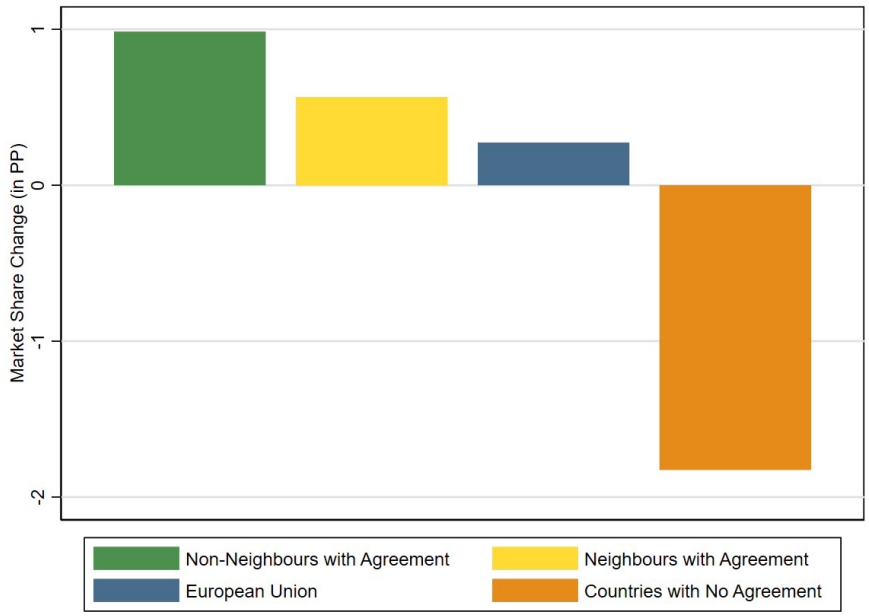


Source: Own classification based on information on the various trade cooperation agreements of the EU. These include countries with trade agreements that may be in place or provisionally applied, as well as those countries that recently signed Raw Material Partnerships or signatories of the recent 2022 Joint Statement on Cooperation on Global Supply Chains. Besides the UK and EFTA countries, EU neighbours are identified based on information regarding European Neighbourhood Policy and Enlargement available: https://neighbourhood-enlargement.ec.europa.eu/countries_en.

For the purpose of our analysis, we consider "**reshoring**" as sourcing a larger share of goods from within group (1), EU27, away from group (4), non-agreement partners. We consider "**nearshoring**" as sourcing from neighbouring agreement partners in group (2), and "**partnershoring**" as sourcing from non-neighbouring agreement partners in group (3), away from non-agreement partners.

Figure 5 shows the changes in market shares held by various trading groups in EU imports from 2021 to 2023 excluding energy related products, measured in percentage points (pp). Analysing the aggregate data reveals a decrease in the market share of non-agreement partners of 1.8pp. Conversely, there have been gains in the market share of all other groups, with EU27 experiencing a 0.3pp increase, non-neighbouring agreement partners displaying an increase of 1pp and neighbouring agreement partners undergoing a nearly 0.6pp increase. This suggests that EU imports have seen evidence of reallocation since 2021, particularly towards EU27 and agreement partners, at the expense of non-agreement partners. However, this represents an overall reallocation of EU imports across all goods, potentially hiding significant product variations. This result could be driven, for example, by a few high-value products. Thus, in the following section, we will test product dynamics through regression analysis at product level, where we will control for specific product characteristics.

Figure 5: Changes in EU import market shares across trading groups for all products from 2021 to 2023



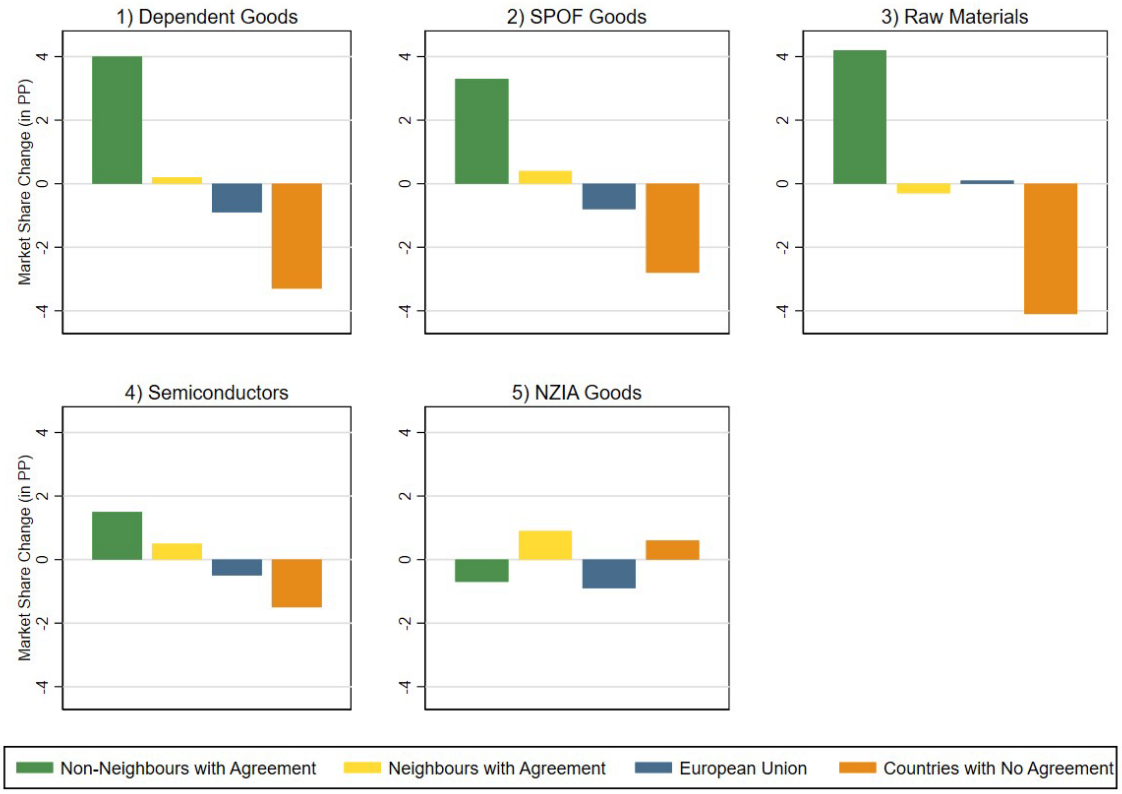
Source: Own calculations based on Eurostat-Comext. Note that energy related products have been excluded. The graph above shows the changes in market shares held by various trading groups in EU imports from 2021 to 2023 excluding energy related products, measured in percentage points (pp).

Given the importance of targeted de-risking, we also investigate specific baskets of products, especially those being part of sensitive supply chains. For this purpose, we focus on some of the supply chains prioritised by EU policymakers since the release of the EU's trade and industrial strategies in 2021. Figure 6 shows the changes in EU import market shares across trading groups for sensitive supply chains as described in Section 2. Figure 6.1 refers to the basket of 298 CN8 goods underpinning the 204 HS6 goods where the EU experiences significant dependencies on foreign markets, as highlighted by Arjona et al. (2023).[39] Figure 6.2 presents a subset of the first basket of goods, also defined by Arjona et al. (2023), namely the 142 CN8 dependent products that are characterised by global SPOFs. Figure 6.3 shows a list of 128 CN8 corresponding to raw materials, which were identified as critical or strategic as part of the European Critical Raw Materials Act. Figure 6.4 includes 77 CN8 products belonging to various segments in the supply chain of semiconductors, as identified by Bonnet and Ciani (2023). Lastly, Figure 6.5 includes a set of final products and first-tier components of net-zero technologies amounting to 134 CN8 goods, such as solar photovoltaics, wind turbines, batteries, heat pumps, electrolysers, fuel cells, among others.[40]

[39] Products in this list are detailed at the 6-digit level of the HS classification. All CN8 codes within an HS6 heading are considered in the analysis. The final list of HS6 products considered as foreign dependent could be provided upon request in accordance with the European Commission's confidentiality guidelines.

[40] The final list of CN8 products related to NZ technologies could be provided upon request in accordance with the European Commission's confidentiality guidelines.

Figure 6: Changes in EU import market shares across trading groups for sensitive supply chains from 2021 to 2023



Source: Own calculations based on Eurostat-Comext. Note that energy related products have been excluded. The graphs above shows the changes in market shares held by various trading groups in EU imports from 2021 to 2023 in various sensitive sectors, measured in percentage points (pp).

With the exception of NZIA products, which experience an increase in the market share of EU imports from non-agreement partners, all other baskets of goods experience an important decline. This decrease is particularly notable for raw materials, for which the market share of EU imports by non-agreement partners decreased by more than 4pp since 2021. These systematic declines, except for NZIA goods, have led to an increase in the market share of EU imports from agreement partners, especially non-neighbours. Depending on the sensitive supply chain that we set a focus on, we observe that neighbouring agreement partners either gain or lose market share but this change is relatively small. The share of intra-EU imports in EU imports has also experienced a decline for all cases except raw materials, although these declines are also relatively small.

To sum up, with the exception of NZIA goods, there is a noticeable reallocation in all other sensitive supply chains from non-agreement partners towards agreement partners. This can be interpreted as evidence of "partnershoring" occurring at the aggregate level for products where the EU experiences foreign dependencies, the subset of high SPOF dependent goods, raw materials, and the products belonging to the semiconductor supply chain. However, as in the previous case, this represents an overall reallocation of EU imports across all goods within a specific sensitive supply chain, potentially masking significant product variations. Therefore, in the subsequent section we conduct a more systematic analysis to account for the heterogeneity of products, in order to be able to draw firm conclusions regarding the reorganisation of EU supply chains.

4. Empirical strategy and results

In the previous section, we have shown that the various shocks experienced by the EU have induced shifts in the geographical composition of aggregate EU imports since 2021. Building upon these observed trends, this section presents more systematic regression-based evidence of the EU import reallocation across trading groups at the product level and examines some of its implications in terms of import diversification levels and price dynamics.

4.1 Product-level EU import reallocation

In order to confirm the evidence of geographical EU import reallocation across trading groups shown in the descriptive statistics, we analyse to what extent moving away from non-agreement partners induces more sourcing from EU27 and/or from agreement partners, whether non-neighbouring or neighbouring. Building on Alfaro and Chor (2023), we start with regression Specification (1):

$$\Delta GROUPshr_k^{23-21} = \alpha_1 \Delta(NAPshr)_k^{23-21} + \alpha_2 \Delta GROUPshr_k^{21-17} + D_{hs4} + \varepsilon_k \quad (1)$$

Three separate regressions are conducted: one for the EU27 and two for the agreement partners, distinguishing between neighbouring and non-neighbouring.

The dependent variable $\Delta GROUPshr_k^{23-21}$ captures the change in the share of each of the three groups in EU imports for the CN8 product *k*, from 2021 to 2023. Our main independent variable $\Delta(NAPshr)_k^{23-21}$ represents the change in the share of non-agreement partners in EU imports for the CN8 product *k*, from 2021 to 2023. The control variable $\Delta GROUPshr_k^{21-17}$ accounts for the changes in the shares in EU imports of a given trading group for a given CN8 product *k* between 2017 and 2021. This allows us to capture pre-existing trends of the EU sourcing strategy following the trade tensions between China and the US. A positive coefficient indicates that, before 2021, similar trends were observed with respect to the trading group in question.[41]

This specification includes HS4 fixed effects, represented by D_{hs4}, to control for differences in product categories at a higher level of aggregation. The aim is to control for product characteristics such as the average tariff, transportation cost intensity and elasticity of substitution within HS4 headings, among other factors. The regression estimates rely on weighted least squares (WLS), with the 2021 CN8 import values of the EU from non-agreement partners used as weights.

[41] For a detailed overview of the timeline of the US trade disputes with China, see Bown and Kolb (2023) "Trump's Trade War Timeline: An up-to-date Guide", available at: https://www.piie.com/sites/default/files/documents/trump-trade-war-timeline.pdf. Consulted on May 31, 2024.

The coefficient of our main variable of interest, represented by α_1, captures the cumulative impact of various events that occurred between 2021 and 2023. It illustrates how changes in the EU import shares from non-agreement partners translate into shifts in the EU import shares from either EU27, neighbouring agreement partners or non-neighbouring agreement partners. A negative and significant coefficient indicates evidence of a reallocation away from non-agreement partners. We define this reallocation as "**reshoring**" when imports are redirected towards the EU27 group, as "**nearshoring**" when that shift materialises towards neighbouring agreement partners, and as "**partnershoring**" when it occurs for non-neighbouring agreement partners. While the descriptive analysis can reveal that a particular group is losing importance in terms of overall EU imports, we still need to confirm that finding by controlling for product characteristics.[42]

Table 1 shows the estimation of Specification (1) for the three trading groups. Column 1 uses the change in import shares from EU27, whereas Columns 2 and 3 use the change in import shares from agreement partners, neighbours and non-neighbours, respectively. A negative and significant α_1 coefficient in each column indicates that, on average, a decrease in the share imported from the non-agreement partners leads to an increase in the share imported from the respective trading group. Thus, as shown in Column 1, there is a reallocation of EU imports from non-agreement partners towards the EU27 group, pointing to early signs of reshoring of EU imports. Furthermore, there are also signs of agreement partner shoring, both near and far, as shown in Columns 2 and 3, respectively.

Table 1: Market share changes in EU imports across trading groups

	ΔGROUP import share (2021-23)		
	EU27	**Agreement Partners**	
	(1)	(2)	(3)
		Neighbours	Non-Neighbours
ΔNAP import share (2021-23)	-0.671***	-0.082***	-0.153***
	(0.031)	(0.030)	(0.022)
Lag ΔGROUP import share (2017-21)	-0.179***	-0.173***	-0.244***
	(0.017)	(0.023)	(0.024)
Observations	9283	9239	9155
Adjusted R^2	0.306	0.072	0.137
HS4 FE	Yes	Yes	Yes

*Note: The regression estimates rely on weighted least squares (WLS), with the 2021 EU import values of CN8 products from the NAP trading group used as weights. NAP stands for non-agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.*

To ensure the robustness of our results, we perform several sensitivity checks for each trading group, as detailed in Annex II. Table II.1 shows the results for the EU27 group, while Tables II.2

[42] The main contribution of this analysis is to understand the reallocation of EU imports from non-agreement partners to other trading groups, including the EU27 and neighbouring and non-neighbouring agreement partners. Describing the reasons behind the reallocations of EU imports in terms of agreement partners is beyond the scope of this paper.

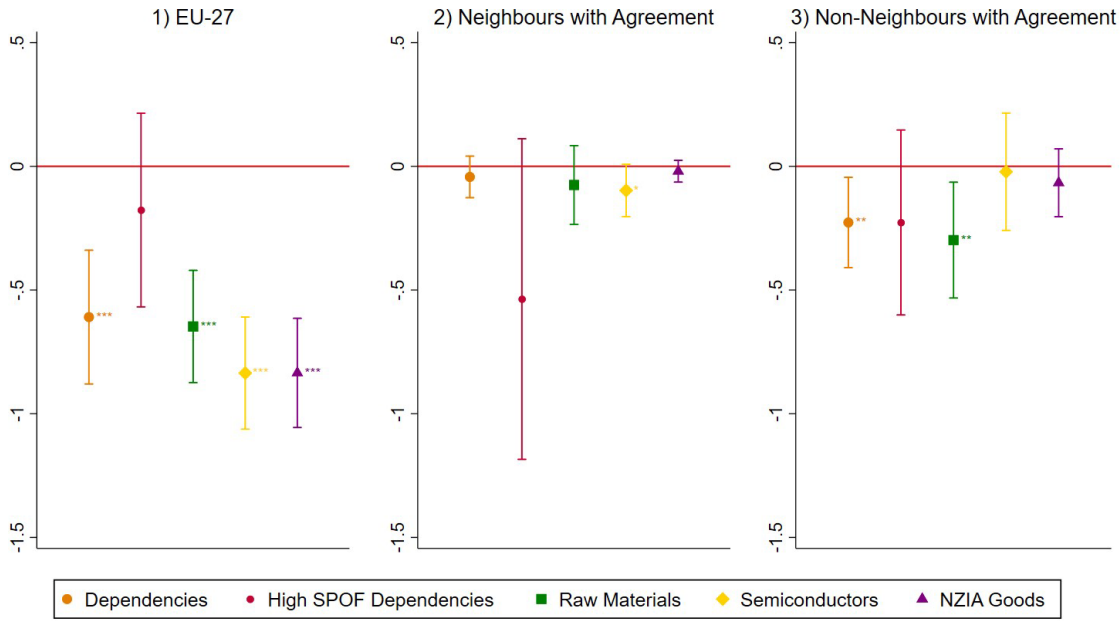
and II.3 refer to the agreement partners, neighbours and non-neighbours, respectively. In terms of the different columns, Column 1 restricts the previous sample to CN8 products where we observe a decrease in the import market share from the non-agreement partners. This is done to check the direction of the sign when interpreting the results, as a negative coefficient α_1 might also imply that imports shift towards the non-agreement partners at the expense of the EU27 and the agreement partner groups. In Columns 2 and 3, we use the period from 2019 to 2023 and from 2017 to 2023, respectively, to compute the change in the dependent variable. The alternative specifications aim at testing whether the baseline results could be interpreted as de-risking from non-agreement partners or just as a normalisation of import dynamics since the COVID-19 period.[43] Moreover, Column 4 imposes more disaggregated product fixed effects (i.e., HS6 product categories) to control for more unobserved characteristics. Column 5 uses import volumes instead of values as weights in the weighted least squares (WLS) regression to correct for potential price fluctuations. Column 6 relies on changes in import values instead of changes in market shares as the dependent variable, to ensure that the results also hold for absolute values of import flows. Our baseline results are confirmed throughout our sensitive checks.

Next, we repeat the same statistical exercise focusing on the sensitive supply chains highlighted in Section 2. Figure 7 presents the coefficient of interest (i.e., α_1) derived from repeated regressions of Specification (1) for various baskets of products.[44] The first figure reports the results using the change in the import share from the EU27 group as the dependent variable. With the exception of high SPOF goods, in all other subsets of products, we consistently find negative and significant results, indicating that, on average, the intra-EU27 import share increases as the share imported from the non-agreement partners decreases. This provides evidence of reshoring of EU imports across these sensitive supply chains at the expense of non-agreement partners. The second figure repeats the analysis using the import share from agreement partners geographically close to the EU. With the exception of semiconductors, all of the coefficients are negative and statistically insignificant, suggesting that there is no systematic evidence of “nearshoring” for the sensitive supply chains under analysis. Finally, the third figure reports the results for the agreement partners geographically far from the EU. We find negative coefficients that are statistically significant for the group of dependent goods and raw materials, which indicates evidence of “partnershoring” for these categories of products.

[43] Moreover, the timeframes for the control variables are adjusted accordingly in each column to control for pre-existing import trends following the Russian invasion of Ukraine in 2014.

[44] Specification (1) is modified to incorporate HS2 instead of HS4 fixed effects. This adaptation is required by the restricted number of products analysed within each category.

Figure 7: Market share changes in EU imports across trading groups for sensitive supply chains (2021-23)



*Source: Own calculations based on data from Eurostat-Comext. The reported coefficients α_1 result from the repeated regressions of Specification (1) for each subset of products detailed in the legend and correspond to the variable "ΔNAP import share". A negative and significant coefficient α_1 in each bar indicates that, on average, a decrease in the share imported from the non-agreement partners leads to an increase in the share imported from the respective trading group. HS2 categories are used as fixed effects instead of HS4. The significance level is the following: * p<0.10, ** p<0.05, *** p<0.01.*

4.2 Implications of EU import reallocation for import diversification

In the previous section, we observed the recent reallocation of EU imports across trading groups. Based on that empirical evidence, this section now analyses whether EU imports become more diversified as a result. This remains an important aspect of the EU's strategy of supply chain de-risking. For this purpose, we study the dynamics of the concentration of EU imports since 2021, as these move away from non-agreement partners. We rely on regression Specification (2) below, which uses the Herfindahl-Hirschman Index (HHI) index as a measure of import concentration:[45]

$$\Delta HHI_k^{23-21} = \alpha_1 \Delta(NAPshr)_k^{23-21} + \alpha_2 \Delta HHI_k^{21-17} + D_{hs4} + \varepsilon_k \quad (2)$$

In Specification (2), the dependent variable, represented by ΔHHI_k^{23-21}, denotes the change in the HHI for the CN8 product *k* between 2021 and 2023. This measure is used to capture changes in the diversification level of EU imports. In terms of independent variables, $\Delta(NAPshr)_k^{23-21}$

[45] The HHI is computed using the formula: $\sum_{i=1}^{n}(s_i^2)$ where s_i represents the market share of imports from country *i*, and *n* denotes the total number of countries included in the HHI calculation. The resulting index ranges from 0 to 1, with higher values indicating greater concentration of EU imports or, in other words, low diversification.

represents the change in the share of non-agreement partners in EU imports. This allows to assess whether moving away from non-agreement partners leads to a change in the concentration of EU imports. In addition, ΔHHI_k^{21-17} controls for the changes in the HHI of EU imports from 2017 to 2021. This allows us to capture pre-existing trends in the EU's diversification strategy, where a positive coefficient indicates similar trends in terms of EU import diversification before 2021. This specification includes HS4 fixed effects, represented by D_{hs4}, to control for differences in diversification across product categories at a higher level of aggregation.

Table 2 shows the regression results, where Column 1 presents the findings derived from using the HHI index computed across all EU trading partners, excluding intra-EU trade, to analyse dynamics in EU import diversification. In Column 2, we replicate this analysis computing the HHI only across agreement partners, whether neighbouring or non-neighbouring, which excludes both the EU and the non-agreement partners. The underlying objective is to study diversification trends among agreement partners.

Column 1 highlights a positive and statistically significant coefficient, suggesting that a reduction in the import share from non-agreement partners is associated with a decrease in the HHI. This result indicates, on average, more diversification of EU imports across all partners, as the reliance on imports from the non-agreement partners diminishes. On the other hand, Column 2 shows a negative and significant coefficient when both the EU and countries from the non-agreement partner countries are excluded from the calculation of the HHI. This suggests that as we observe increasing diversification in EU imports by moving away from non-agreement partners, on average, there is also a growing concentration in certain agreement partners, notably given that ramping up domestic capacity requires a period of adjustment. To sum up, moving away from non-agreement partners induces more diversification in EU imports while more concentration is detected among agreement partners for some products. This indicates that non-agreement partners may play a role in the EU's de-risking strategies in the short run, particularly when aiming at reducing excessive dependence on any single source.[46] [47]

[46] "*This is why it is vitally important that we ensure diplomatic stability and open communication with China. I believe it is neither viable – nor in Europe's interest – to decouple from China. Our relations are not black or white – and our response cannot be either. This is why we need to focus on de-risk – not de-couple*.", Speech by President von der Leyen on EU-China relations to the Mercator Institute for China Studies and the European Policy Centre

[47] If imports remain excessively concentrated in specific geographic regions, there may still be risks associated with unexpected disruptions such as natural disasters. Bijnens et al. (2024), using Belgian data, estimated the propagation of natural disaster impacts through production networks. Their findings show a significant negative effect on the performance of firms located in areas directly impacted by severe floods, as well as on firms with upstream exposure, highlighting the vulnerability of interconnected supply chains to unexpected weather shocks.

Table 2: Change in the concentration of EU imports

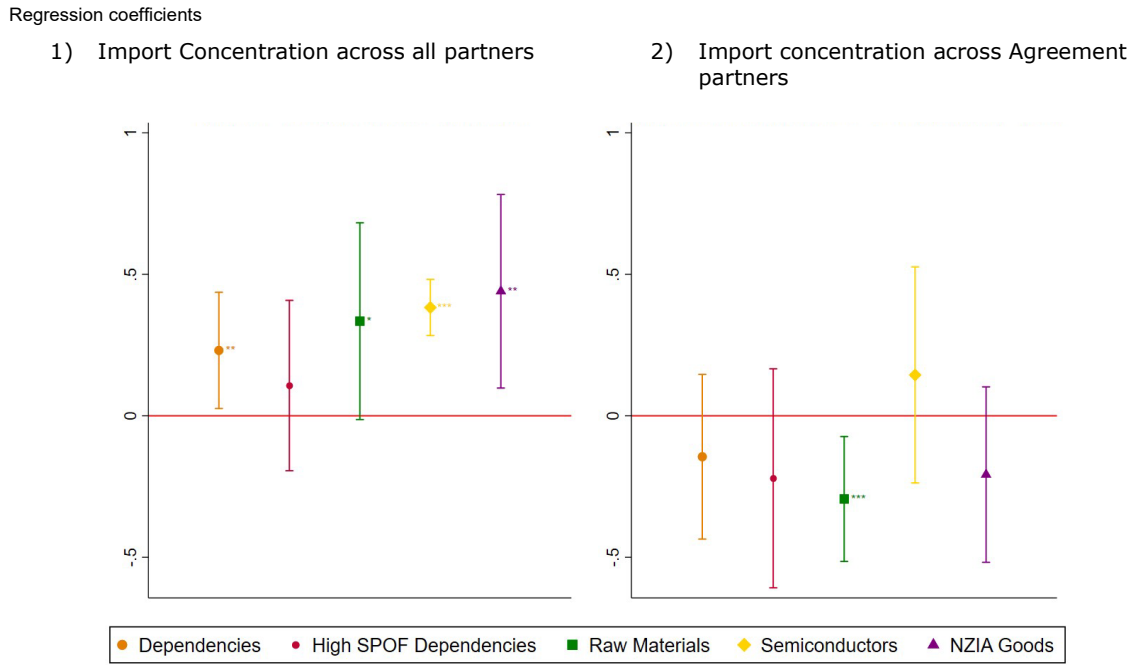
	Δimport concentration (2021-23)	
	All Partners	**Agreement Partners**
	(1)	(2)
ΔNAP import share (2021-23)	0.300***	-0.105***
	(0.033)	(0.038)
Lag Δimport concentration (2017-21)	-0.303***	-0.317***
	(0.016)	(0.016)
Observations	9283	9283
Adjusted R^2	0.132	0.113
HS4 FE	Yes	Yes

*Note: The regression estimates rely on weighted least squares (WLS), with the 2021 EU import values of CN8 products from the NAP trading group used as weights. NAP stands for non-agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.*

The results are consistent when performing different robustness checks, detailed in Annex III for the alternative definitions of the HHI. Table III.1 shows the coefficients of the robustness checks using the definition of the HHI across all partners, while Table III.2 displays the robustness checks for the HHI computed across agreement partners. In terms of the different columns, Column 1 restricts the previous sample to CN8 products where we observe a decrease in the market share of the non-agreement partners. In Columns 2 and 3, we use the period from 2019 to 2023 and from 2017 to 2023, respectively, to compute the change in the dependent variable. Column 4 imposes more disaggregated product fixed effects by controlling for HS6 product categories. Finally, Column 5 uses import volumes instead of values as weights in the weighted least squares (WLS) regression. In both definitions of the HHI, the coefficients remain largely consistent with our benchmark regressions.

Next, we conduct the same analysis concentrating on the sensitive supply chains identified by EU policymakers since 2021. Figure 8 displays the coefficient of interest (i.e., α_1) obtained from repeated regressions of Specification (2) for different categories of products and using the two alternative HHI definitions. While the first graph computes the HHI across all trading partners, the second figure relies on the HHI definition which excludes imports from non-agreement partners. The first figure shows that, with the exception of high SPOF dependent products, the coefficients of interest are positive and significant. Once again, this suggests that as the EU import share from non-agreement partners declines, EU imports of various sensitive supply chains become more diversified. However, as shown in the second figure, aside from raw materials, there is no evidence of a shift in the diversification of EU imports among the agreement partners for other sensitive supply chains, as the coefficients are statistically insignificant.

Figure 8: Impact of EU Import Reallocation on Diversification Across Sensitive Sectors (2021-23)



*Source: Own calculations based on data from Eurostat-Comext. The reported coefficients (i.e., α_1) result from the repeated regressions of Specification (1) for each subset of products detailed in the legend and correspond to the variable "ΔNAP import share". The positive (negative) and significant coefficients suggest that a reduction in the import share from non-agreement countries is associated with a decrease (increase) in the HHI, hinting to more (less) diversification of EU imports. HS2 categories are used as fixed effects instead of HS4. The significance level is the following: * p<0.10, ** p<0.05, *** p<0.01*

4.3 Implications of EU import reallocation for import prices

In the previous sections, we explored the ongoing global reorganisation of EU supply chains, highlighting not only the shift towards intra-EU trade in the form of reshoring but also towards agreement partners, both in the form of nearshoring and partnershoring. We also assessed whether these changes led to greater diversification of EU imports. Given that evidence, this section now assesses the implications of the observed reallocations in terms of changes in EU import prices. To answer this question, we rely on Specification (3) below:

$$\Delta imp\_price_{ik}^{23-21} = \alpha_1 \Delta(NAPshr)_k^{23-21} + \alpha_2 \Delta imp\_price_{ik}^{21-17} + D_{hs4} + f_i + \varepsilon_k \qquad (3)$$

where the variable $\Delta imp\_price_{ik}^{23-21}$ refers to the change in the average unit price of EU imports of the CN8 product *k*, from country *i* in a given trading group, from 2021 to 2023. The independent variable $\Delta(NAPshr)_k^{23-21}$ represents the change in the share of non-agreement partners in EU imports from 2021 to 2023 for a given CN8 product category *k*. In addition, the variable $\Delta imp\_price_{ik}^{21-17}$ controls for pre-existing trends in the unit price of product *k* imported by the EU from country *i* in a given trading group. A positive coefficient indicates similar trends with respect to price dynamics before 2021. The specification also includes HS4 fixed effects to control for product characteristics at a higher level of aggregation, as well as country fixed effects f_i to control for trading partner characteristics, such as the distance to the EU, size, level of

development, among others. Considering that we are analysing import price dynamics, maintaining the country dimension is crucial due to the heterogeneity of the partners within each trading group.

Table 3 reports the estimates of Specification (3), where the main coefficient of interest is represented by α_1. A negative and significant coefficient suggests that, on average, reallocating EU imports away from the non-agreement partners is correlated with an increase in the unit price of the goods purchased from countries in the other trading groups, namely EU27 (Column 1), neighbouring agreement partners (Column 2) or non-neighbouring agreement partners (Column 3). We observe that the coefficients consistently show negative values across all trading groups but with different levels of significance, with the EU27 and non-neighbouring agreement partners being significant at a 10% confidence level. In terms of interpretation, a 10 pp decrease in the import share of the non-agreement partners leads to an average 0.74% increase in unit prices if these imports are redirected to the EU27 (reshoring) and a 2.71% average increase for non-neighbouring agreement partners (partnershoring). These results show that, at least in the short-term, there may be a potential cost of resilience in the form of price increases, whereas as highlighted above, in the medium term, firms' adaptation strategies might reduce that cost.

Table 3: Change in the EU import unit price

	Δimport unit value (2021-23)		
	EU27	**Agreement Partners**	
	(1)	(2)	(3)
		Neighbours	Non-Neighbours
ΔNAP import share (2021-23)	-0.074*	-0.123	-0.271***
	(0.044)	(0.100)	(0.093)
Lag Δimport unit value (2017-21)	-0.391***	-0.415***	-0.434***
	(0.004)	(0.006)	(0.005)
Observations	198043	60924	75377
Adjusted R^2	0.193	0.205	0.218
Country FE	Yes	Yes	Yes
HS4 FE	Yes	Yes	Yes

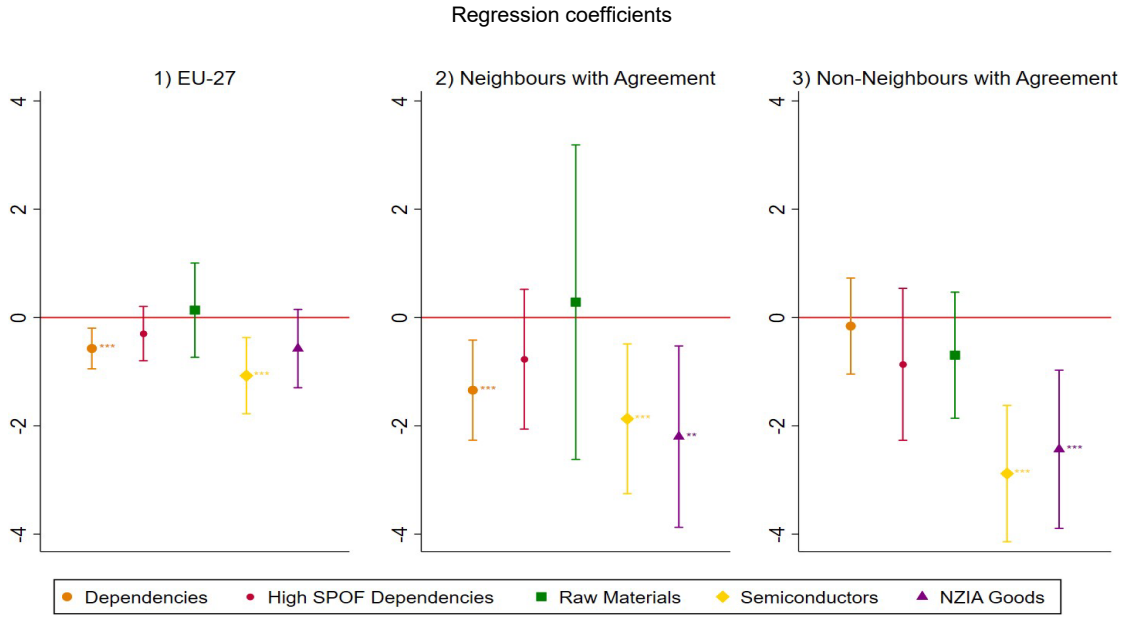
*Note: The regression estimates rely on Ordinary Least Squares (OLS). NAP stands for non-agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.*

These findings remain relatively stable when performing various robustness checks detailed in Annex IV for the EU27, neighbouring agreement partners and non-neighbouring agreement partners. In these tables, Column 1 restricts the sample to products where we observe a reduction in the share of EU imports from non-agreement partners. Columns 2 and 3 use alternative time periods (i.e., 2019-2023 and 2017-2023, respectively) to report the change in import unit values. Finally, Column 4 reports the results with HS6 product categories as fixed effects.

Next, we look at the implications of EU import reallocation for import unit prices across the sensitive baskets of products previously identified, providing further insights into the potential cost of resilience. Figure 9 displays the coefficient of interest obtained from the estimation of Specification

(3), differentiating across the various trading groups. The first chart shows that in two sensitive baskets of products, such as dependencies and semiconductors, there is a statistically significant correlation between the reallocation of EU imports away from non-agreement partner countries and the intra-EU import prices. In the second figure, we observe a negative and significant coefficient across product baskets, with the exception of dependent products characterised by global single point of failures and raw materials. To different degrees, this suggests that reallocating EU imports away from non-agreement partners towards neighbouring agreement partners leads to an average increase in EU import prices. The results for the non-neighbouring agreement partners are presented in the third figure. Once again, we observe a negative coefficient for some sensitive baskets, namely semiconductors and net-zero technologies, indicating that reallocating imports away from non-agreement partners to non-neighbouring agreement partners is associated with higher import prices. For those baskets of goods where we do not find statistically significant coefficients, we cannot conclude that prices are not increasing as a result of the reallocation of EU imports away from non-agreement partners. To sum up, we find mixed evidence in the short-term when it comes to the correlation and the intensity between decreases in the share of non-agreement partners and the changes in import prices from trading groups.

Figure 9: Impact of EU Import Reallocation on Prices Across Sensitive Sectors (2021-23)



*Source: Own calculations based on data from Eurostat-Comext. The reported coefficients (α_1) result from the repeated regressions of Specification (3) for each subset of products detailed in the legend and correspond to the variable "ΔNAP import share". A negative and significant coefficient indicates that on average, reallocating EU imports away from the non-agreement trading group is correlated with an increase in the unit price of the goods purchased from countries in a given trading group. HS2 categories are used as fixed effects instead of HS4. The significance level is the following: * p<0.10, ** p<0.05, *** p<0.01.*

5. Conclusion

What kind of reallocation dynamics are global supply chains experiencing? How have EU supply chains adapted in the face of de-risking? What are the potential costs associated with the ongoing global trade reallocation? How is the EU plotting its path through an increasingly fragmented trade landscape?

This paper aims to provide evidence that can help answer those questions. It examines the transformation of EU supply chains in response to recent disruptions and evolving economic strategies in the EU and its trading partners. Using highly disaggregated trade data, we analyse the emerging reallocation of EU import flows, examining its implications for diversification and price dynamics. The analysis is timely, given rising geopolitical uncertainties and the ongoing roll out of EU policies to boost internal capacities and mitigate supply chain risks in critical supply chains.

Our findings confirm that the EU supply chains are not static entities but rather fast-adapting dynamic networks with a significant capacity to adjust to changes in the global trade landscape. The paper provides evidence of a reallocation of EU imports away from the non-agreement partners into EU27 (**reshoring**), neighbouring agreement partners (**nearshoring**) and non-neighbouring agreement partners (**partnershoring**), with varying intensities on these three fronts and also for different categories of sensitive goods, yet in line with the EU's goals to curb dependencies and vulnerabilities.

Nevertheless, the ongoing reallocation of global supply chains may bear associated effects in the shape of increased import concentration from agreement countries or upward pressures on prices, at least in the short term, and these could generate challenges in the balancing of efficiency and resilience. In fact, and despite sectoral differences, we observe a recent overall trend of EU imports shifting from countries without any bilateral trade initiative towards the EU, as well as towards neighbouring and distant partners in ongoing bilateral trade initiatives. On this front, our findings detect higher diversification in EU imports. However, for some products this shift might initially focus on certain agreement partners, notably given that ramping up domestic capacity requires a period of adjustment. This indicates that non-agreement partners may also play a role in the EU's de-risking strategies, particularly to reduce excessive dependencies on any single country. Furthermore, the findings are mixed concerning both the correlation and the strength of the relationship between the reduction in the share of non-agreement partners and the fluctuations in import prices from trading groups.

In short, the EU's proactive stance, largely reflected in its updated Trade and Industrial strategies, as well as in subsequent Acts and policy initiatives, highlights the importance of ensuring international partnerships with like-minded partners while promoting internal capacities wherever feasible in order to mitigate vulnerabilities in strategic sectors. Recent EU policy actions are getting fully rolled out, and in that context, it is extremely relevant to understand how EU supply chains are

adjusting. Yet the economic literature has only begun to scratch the surface to better understand these complex dynamics and their implications for the EU and its main trading partners. The global reconfiguration of international supply chains is not a phenomenon exclusively confined to the EU. In fact, as attested by recent research on industrial policy actions, many global economic actors have put in place their own concrete policy responses in the realm of supply chains resilience, and these risks are creating spillovers effects on other world regions.

In conclusion, our analysis offers valuable insights into the shifting *tectonics* of EU supply chains. For the EU, we find evidence of an ongoing reallocation of imports away from non-agreement partners and into agreement partners, whether neighbouring or non-neighbouring. This is not challenge-free. In addition, the evolving dynamics of international trade will require continuous monitoring and analysis efforts. Equally, adaptable policy frameworks will be needed to maintain the right balance between openness and strategic autonomy in a global economy which now bears a higher degree of systemic risk and uncertainty.

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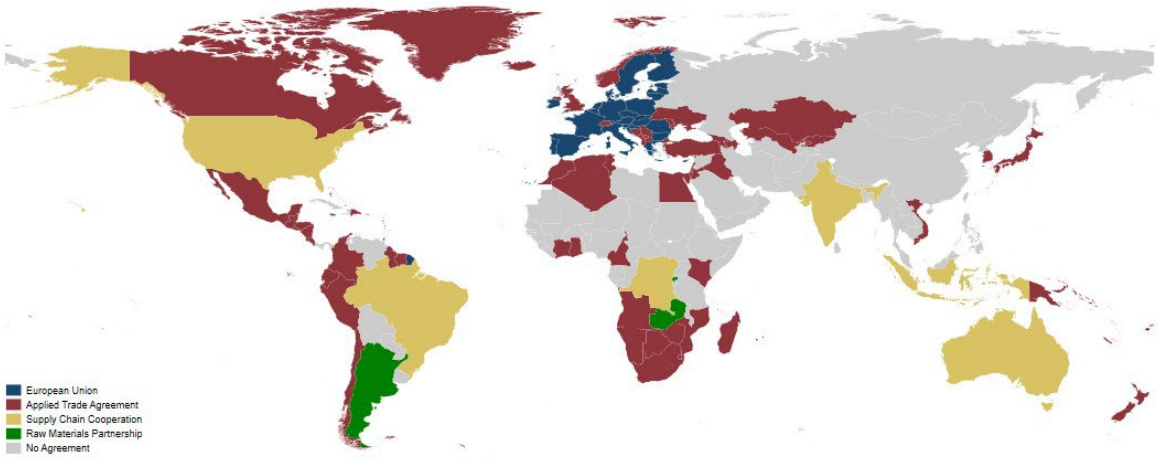
Annex I: Country classification by EU agreements



Source: Own elaboration based on European Commission documents covering EU trade relationships with other countries, complemented with raw materials partnerships the 2022 Joint statement on Cooperation on Global Supply Chains. Note that in countries where multiple categories apply, the map prioritises the classification in the following order for simplicity: first, Applied Trade Agreement; second, Supply Chain Cooperation; and finally, Raw Materials Partnerships.

Annex II: Robustness checks for market share changes

Table II.1: Market share changes in EU imports for the EU27 group

	ΔEU27 import share for various periods					
	2021-23 **NAP Market Share Decreases**	2019-23 **Alternative Period (I)**	2017-23 **Alternative Period (II)**	2021-23 **Restrictive Fixed Effects**	2021-23 **Volume Weights**	2021-23 **Import Value Change**
	(1)	(2)	(3)	(4)	(5)	(6)
ΔNAP import share	-0.677***	-0.652***	-0.634***	-0.648***	-0.669***	-1.303***
	(0.058)	(0.027)	(0.026)	(0.049)	(0.031)	(0.199)
Lag ΔEU27 import share (2017-21)	-0.138***			-0.160***	-0.179***	
	(0.028)			(0.025)	(0.017)	
Lag ΔEU27 import share (2014-19)		-0.258***				
		(0.020)				
Lag ΔEU27 import share (2014-17)			-0.322***			
			(0.024)			
Lag ΔEU27 log import value (2017-21)						-0.206***
						(0.026)
Observations	4735	9139	9129	9283	9283	9279
Adjusted R^2	0.245	0.283	0.273	0.384	0.304	0.231
HS4 FE	Yes	Yes	Yes		Yes	Yes
HS6 FE				Yes		

Note: The regression estimates rely on weighted least squares (WLS), with the 2021 EU import values of CN8 products from the non-agreement partners used as weights. NAP stands for non-agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.

Table II.2: Market share changes in EU imports for the neighbouring agreement partners

	Δ neighbouring agreement (NA) partners import share for various periods					
	2021-23 **NAP Market Share Decreases**	2019-23 **Alternative Period (I)**	2017-23 **Alternative Period (II)**	2021-23 **Restrictive Fixed Effects**	2021-23 **Volume Weights**	2021-23 **Import Value Change**
	(1)	(2)	(3)	(4)	(5)	(6)
ΔNAP import share	-0.116**	-0.123***	-0.123***	-0.139***	-0.136***	-0.935***
	(0.049)	(0.019)	(0.018)	(0.041)	(0.028)	(0.352)
Lag ΔNA import share (2017-21)	-0.126***			-0.138***	-0.174***	
	(0.036)			(0.034)	(0.023)	
Lag ΔNA import share (2014-19)		-0.296***				
		(0.027)				
Lag ΔNA import share (2014-17)			-0.395***			
			(0.033)			
Lag ΔNA log import value (2017-21)						-0.250***
						(0.020)
Observations	4724	9109	9099	9239	9239	9054
Adjusted R^2	0.017	0.146	0.148	0.179	0.080	0.131
HS4 FE	Yes	Yes	Yes		Yes	Yes
HS6 FE				Yes		

Note: The regression estimates rely on weighted least squares (WLS), with the 2021 EU import values of CN8 products from the non-agreement partners used as weights. NAP stands for non-agreement partners and NA stands for neighbouring agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.

Table II.3: Market share changes in EU imports for the non-neighbouring agreement partners

	Δ non-neighbouring agreement partners (NNA) import share for various periods					
	2021-23 **NAP Market Share Decreases**	2019-23 **Alternative Period (I)**	2017-23 **Alternative Period (II)**	2021-23 **Restrictive Fixed Effects**	2021-23 **Volume Weights**	2021-23 **Import Value Change**
	(1)	(2)	(3)	(4)	(5)	(6)
ΔNAP import share	-0.161***	-0.143***	-0.169***	-0.176***	-0.152***	-0.780***
	(0.040)	(0.024)	(0.022)	(0.038)	(0.022)	(0.290)
Lag ΔNNA import share (2017-21)	-0.198***			-0.232***	-0.244***	
	(0.039)			(0.041)	(0.024)	
Lag ΔNNA import share (2014-19)		-0.326***				
		(0.028)				
Lag ΔNNA import share (2014-17)			-0.400***			
			(0.034)			
Lag ΔNNA log import value (2017-21)						-0.270***
						(0.020)
Observations	4700	9042	9021	9155	9155	8566
Adjusted R^2	0.097	0.157	0.179	0.256	0.135	0.166
HS4 FE	Yes	Yes	Yes		Yes	Yes
HS6 FE				Yes		

Note: The regression estimates rely on weighted least squares (WLS), with the 2021 EU import values of CN8 products from the non-agreement partners used as weights. NAP stands for non-agreement partners and NNA stands for non-neighbouring agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.

Annex III: Robustness checks for diversification changes

Table III.1: Change in the concentration of EU imports across all partners

	ΔEU27 import concentration I (i.e., across all partners, excluding EU27) for various periods				
	2021-23 **NAP Market Share Decreases**	2019-23 **Alternative Period (I)**	2017-23 **Alternative Period (II)**	2021-23 **Restrictive Fixed Effects**	2021-23 **Volume Weights**
	(1)	(2)	(3)	(4)	(5)
ΔNAP import share	0.377***	0.226***	0.160***	0.308***	0.302***
	(0.067)	(0.029)	(0.027)	(0.051)	(0.032)
Lag ΔEU27 import concentration I (2017-21)	-0.314***			-0.312***	-0.303***
	(0.021)			(0.031)	(0.016)
Lag ΔEU27 import concentration I (2014-19)		-0.331***			
		(0.018)			
Lag ΔEU27 import concentration I (2014-17)			-0.098***		
			(0.022)		
Observations	4735	9142	9132	9283	9283
Adjusted R^2	0.149	0.136	0.040	0.039	0.132
HS4 FE	Yes	Yes	Yes		Yes
HS6 FE				Yes	

Note: The regression estimates rely on weighted least squares (WLS), with the 2021 EU import values of CN8 products from the NAP trading group used as weights. NAP stands for non-agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.

Table III.2: Change in the concentration of EU imports across agreement partners

	ΔEU27 import concentration II (i.e., across partner countries, excluding EU27 and non-agreement partners) for various periods				
	2021-23 **NAP Market Share Decreases**	2019-23 **Alternative Period (I)**	2017-23 **Alternative Period (II)**	2021-23 **Restrictive Fixed Effects**	2021-23 **Volume Weights**
	(1)	(2)	(3)	(4)	(5)
ΔNAP import share	-0.046	-0.194***	-0.182***	-0.181***	-0.108***
	(0.075)	(0.037)	(0.031)	(0.060)	(0.038)
Lag ΔEU27 import concentration II (2017-21)	-0.325***			-0.341***	-0.317***
	(0.025)			(0.030)	(0.016)
Lag ΔEU27 import concentration II (2014-19)		-0.377***			
		(0.017)			
Lag ΔEU27 import concentration II (2014-17)			-0.423***		
			(0.019)		
Observations	4735	9142	9132	9283	9283
Adjusted R^2	0.092	0.151	0.148	0.191	0.113
HS4 FE	Yes	Yes	Yes		Yes
HS6 FE				Yes	

Note: The regression estimates rely on weighted least squares (WLS), with the 2021 EU import values of CN8 products from the NAP trading group used as weights. NAP stands for non-agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.

Annex IV: Robustness checks price changes

Table IV.1: Change in the EU import unit price for the EU27 group

	ΔEU27 log import unit value for various periods			
	2021-23 **NAP Market Share Decreases**	2019-23 **Alternative Period (I)**	2017-23 **Alternative Period (II)**	2021-23 **Restrictive Fixed Effects**
	(1)	(2)	(3)	(4)
ΔNAP import share	-0.121*	0.014	-0.062	-0.162**
	(0.069)	(0.044)	(0.038)	(0.066)
Lag ΔEU27 log import unit value (2017-21)	-0.389***			-0.394***
	(0.005)			(0.004)
Lag ΔEU27 log import unit value (2014-19)		-0.395***		
		(0.004)		
Lag ΔEU27 log import unit value (2014-17)			-0.423***	
			(0.004)	
Observations	104334	185845	185440	198022
Adjusted R^2	0.197	0.193	0.192	0.225
Country FE	Yes	Yes	Yes	
HS4 FE	Yes	Yes	Yes	
HS6 FE				Yes

Note: The regression estimates rely on Ordinary Least Squares (OLS). NAP stands for non-agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.

Table IV.2: Change in the EU import unit price for the neighbouring agreement partners

	Δ neighbouring agreement (NA) partners log import unit value for various periods			
	2021-23 **NAP Market Share Decreases**	2019-23 **Alternative Period (I)**	2017-23 **Alternative Period (II)**	2021-23 **Restrictive Fixed Effects**
	(1)	(2)	(3)	(4)
ΔNAP import share	-0.302*	-0.197**	-0.097	-0.111
	(0.164)	(0.094)	(0.086)	(0.158)
Lag ΔNA log import unit value (2017-21)	-0.413***			-0.417***
	(0.008)			(0.006)
Lag ΔNA log import unit value (2014-19)		-0.438***		
		(0.006)		
Lag ΔNA log import unit value (2014-17)			-0.457***	
			(0.006)	
Observations	33689	58435	57922	60650
Adjusted R^2	0.208	0.214	0.207	0.220
Country FE	Yes	Yes	Yes	
HS4 FE	Yes	Yes	Yes	
HS6 FE				Yes

Note: The regression estimates rely on Ordinary Least Squares (OLS). NAP stands for non-agreement partners and NA stands for neighbouring agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.

Table IV.3: Change in the EU import unit price for the non-neighbouring agreement partners

	Δ non-neighbouring agreement partners (NNA) log import unit value for various periods			
	2021-23 **NAP Market Share Decreases**	2019-23 **Alternative Period (I)**	2017-23 **Alternative Period (II)**	2021-23 **Restrictive Fixed Effects**
	(1)	(2)	(3)	(4)
ΔNAP import share	-0.214	-0.256***	-0.220***	-0.108
	(0.164)	(0.085)	(0.077)	(0.137)
Lag ΔNNA log import unit value (2017-21)	-0.432***			-0.433***
	(0.006)			(0.005)
Lag ΔNNA log import unit value (2014-19)		-0.432***		
		(0.005)		
Lag ΔNNA log import unit value (2014-17)			-0.460***	
			(0.005)	
Observations	41661	71693	71229	75059
Adjusted R^2	0.219	0.217	0.216	0.237
Country FE	Yes	Yes	Yes	
HS4 FE	Yes	Yes	Yes	
HS6 FE				Yes

Note: The regression estimates rely on Ordinary Least Squares (OLS). NAP stands for non-agreement partners and NNA stands for non-neighbouring agreement partners. Standard errors in parentheses, with * p<0.10, ** p<0.05, *** p<0.01 denoting significance at the 10%, 5% and 1% levels, respectively.

Abbreviations

NA	Neighbouring agreement partners
NNA	Non-neighbouring agreement partners
CN	Combined Nomenclature
CRM	Critical Raw Materials
EFTA	European Free Trade Association
EIB	European Investment Bank
EU	European Union
GDP	Gross Domestic Product
HS	Harmonised System
NAP	Non-Agreement Partners
NZ	Net-Zero
NZIA	Net-Zero Industry Act
OLS	Ordinary Least Squares
pp	Percentage Points
SPOF	Single Point of Failure
SRM	Strategic Raw Material
UK	United Kingdom
US	United States
WLS	Weighted Least Squares

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