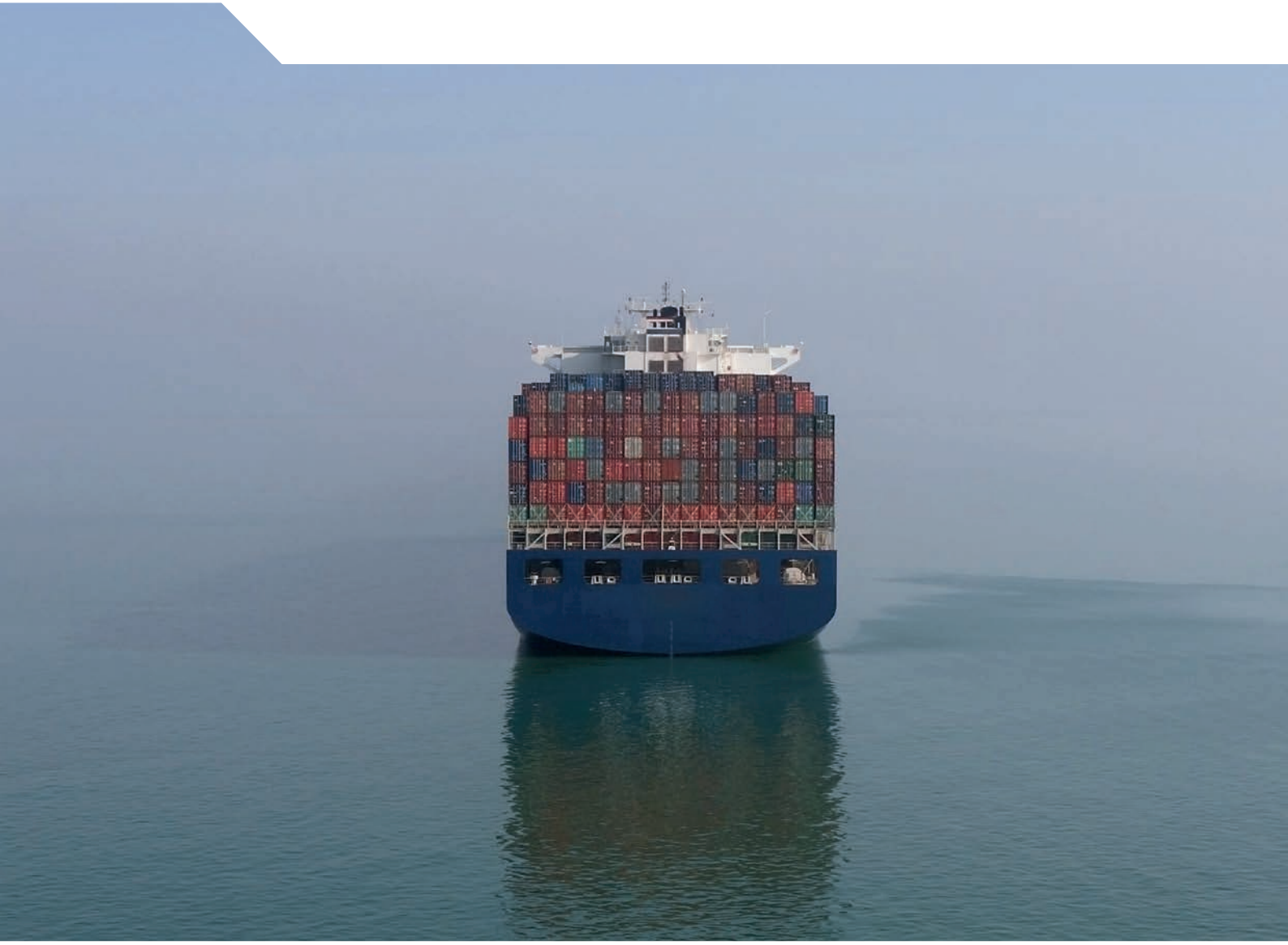
Risks and Resilience in Global Trade

KEY TRENDS IN 2023-2024



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Foreword

Since 2020, international trade has been significantly impacted by multiple, overlapping shocks that continue to reshape global trading patterns. The COVID-19 pandemic's initial wave of restrictions shut down many economies, abruptly shifting consumption from services to goods and causing widespread disruptions across supply chains and transportation networks. As economies began to recover, pent-up demand stemming from the COVID-19 period added further pressure on already strained supply chains. At the same time, new challenges soon emerged ─ including the ongoing Russian Federation's (hereafter, Russia) war of aggression against Ukraine and associated sanctions against Russia, increasing trade tensions between the United States and the People's Republic of China (hereafter, China), and the crisis in the Middle East and the Red Sea ─ further disrupting trade flows and adding uncertainty to markets.

It was during the COVD-19 recovery that international trade and trade policy community recognised the need for timely information on these rapidly evolving trade patterns and this is when the OECD launched its first in a series of annual reports monitoring the rapid developments in global trade. These updates provide essential analysis of the impacts of these unprecedented disruptions on the international trading system. Using high-frequency, detailed data and advanced modelling tools, past reports in this series have offered insights into the ongoing recovery from the pandemic and highlighted the trade implications of the Russia's war of aggression against Ukraine.

As the fourth report in this series, this update on international trade developments continues to monitor important trends in international trade amidst the aftermath of the pandemic and recent escalations in geopolitical tensions, such as changes in aggregate trade flows, trading patterns at the product and partner level and international commodity prices. In addition, this report includes an overview of maritime routes and choke points and discusses how recent disruptions in key maritime routes may have impacted shipping costs and global trade overall. In the context of recent concerns and tensions over growing trade dependencies in the electric vehicles market (EVs), the report also examines the evolution in the global concentration of trade in EVs and EV batteries, critical components in the green transition, with long, complex supply chains which are increasingly targeted by industrial and trade policies.

This OECD update on international trade developments serves as a critical resource for understanding current shifts in the trade landscape. It informs policy discussions and contributes to broader trade-related research, helping stakeholders navigate a rapidly evolving global trade environment by providing analyses on both the risks and resilience of global trade.

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Executive Summary

In 2023, international trade saw one of its weakest performances in four decades — which has been thought to be a temporary situation driven by both the compositional changes, the mix of goods and services traded, related to COVID-19 recovery and macroeconomic pressures such as inflation and high interest rates. While a more positive outlook is anticipated for 2024 and 2025, with trade expected to realign with global output growth, significant challenges remain from economic uncertainties, geopolitical tensions, and transportation disruptions.

This report leverages detailed and high-frequency data to offer a timely, in-depth monitoring of the evolving trade landscape and the factors underlying recent changes amidst the ongoing disruptions to international trade. Examining both short-term and structural trends during 2023 and the first half of 2024, the analysis found that:

- Services trade performed relatively well in 2023, driven by the recovery of travel-related services which were impacted more heavily by the pandemic travel restrictions in 2020-22. The product composition of goods and services trade has been shifting back towards the pre-pandemic structure. However, relatively large differences remain even now, particularly for services.
- After the phase out of the People's Republic of China's (hereafter, China) COVID-19-related restrictions, the country's trade and output grew faster than those for the OECD area and the world in 2023 and at the beginning of 2024 and this supported world trade growth. China's trade in 2023 also saw notable changes in the partner and product structure which may be an indication of a more structural re-orientation of its trade. The decline in China's import growth since the beginning of 2024 may be an indication of the country's economic slowdown which could have significant negative implications for global trade and the world economy.
- The Russian Federation's (hereafter, Russia) goods trade balance declined significantly in 2023 due to a high base effect from soaring energy prices following its invasion of Ukraine in 2022 as well as the effects of far-reaching trade and other economic sanctions.
- Russia's war on Ukraine and associated sanctions have altered global trade patterns with Russia redirecting exports to China and India while importing less from the European Union and other sanctioning OECD countries. G7 imports from Russia have declined in both volume and value terms except for products where Russia is an important exporter such as cereals, fertiliser, metals, and inorganic chemicals. G7 exports to Russia of strategic products such as machinery, vehicles and aircrafts have also decreased.
- Commodity prices continued to decline in 2023, albeit also from historically high levels reached following the COVID-19 pandemic and Russia's invasion of Ukraine and remained higher than pre-pandemic levels at the start of 2024 despite subdued global GDP growth the previous year.
- The on-going transportation disruptions in the Suez and Panama Canals — respectively the nineth and the seventeenth most globally important maritime chokepoints, accounting together for 19% of global maritime trade in 2023 — highlight the importance of understanding the relationships between trade and transportation including routes, chokepoints, and shipping costs.

- Maritime transport accounts for the bulk of internationally traded goods and is a particularly important mode of transport for energy-related and agricultural products which account for most of the non-containerised maritime traffic in the Suez and Panama Canals.
- The rerouting of ships from the Suez Canal is causing longer transit times, shipping delays and increased costs, on maritime routes crossing the Suez Canal, such as those connecting Asia and Europe, as well as on routes to and from the US East Coast due to the interconnectedness of maritime routes—which are already experiencing an additional upward pressure from drought-related restrictions in the Panama Canal.
- Adjustments have been taking place and, so far, the impacts have been relatively limited, illustrating a degree of resilience of global trade to maritime transport disruptions. The analysis also shows a range of effects which, if magnified or spread to other transport routes or chokepoints, may have more significant implications for global trade, prices, and economic growth in the future.
- Against the background of recent announcements of further tariff increases by the United States, the European Union and Canada on electric vehicles (EVs) imported from China, this note explores the evolution of world trade concentration of electric vehicles and EV batteries. This analysis shows a significant increase in the concentration of global trade of EVs and EV-related parts, in particular batteries, mainly accounted for by the emergence of China as a new and fast expanding producer. China's growing market dominance has given rise to concerns about trade dependency and resilience in an industry that is seen as crucial to the green energy transition.

1 Introduction

Responding to the need for timely information on rapidly changing trade patterns emerging during the COVID-19 pandemic, starting in 2021, the OECD began producing regular updates which provided analysis of impacts of recent and developing challenges to the international trading system (hereafter OECD Trade Updates). OECD Trade Updates are designed to inform trade policy discussions in OECD countries and feed into other trade-related work at the OECD. Using detailed data and modelling tools, past reports provided updates on the impact of the COVID-19 pandemic and recovery and shed light on potential trade implications of Russia's war of aggression against Ukraine and accompanying sanctions.[1]

This report continues to assess how trade has developed since the pandemic and Russia's aggression against Ukraine and includes an assessment of recent disruptions in key maritime transportation routes as well as an overview of the evolution of concentration in international trade in electric vehicles (EVs) and EV batteries. Section 2 starts with an overview of what happened to goods and services trade in the past year and provides a discussion of projections for 2024 and 2025. The section also highlights trade developments in China and Russia and ends with an assessment of the commodity markets in the context of recent shocks, with a view of helping to better understand recent trade performance. Section 3 focuses on international trade transport, providing background information in the context of recent disruptions to key maritime routes. The section provides information on how goods are typically transported internationally, gives an overview of important trade routes and maritime chokepoints, and discusses how recent disruptions in the Red Sea and Panama Canal may have impacted other trade routes, shipping costs and global trade overall. Given the recent tensions over the spike in exports of EVs from China, Section 4 includes a discussion on China's increasing dominance in exports of EVs and EV batteries in the context of key features of the passenger car supply chains evolution over the last two decades.

Note

[1] Past reports are available under the following OECD references: TAD/TC/WP(2023)10/FINAL, TAD/TC/WP/RD(2022)1/FINAL, and *OECD Trade Policy Papers* No. 252, 265 and 277.

2 Recent trends in global trade

2.1. Trade is expected to pick up in 2024 and 2025 after subdued growth in 2023 with also significant trade-related downside risks

The estimates from the IMF, OECD and WTO suggest that 2023 was marked by a decline in international goods trade (WTO, 2024[1]) and a very small increase in international trade of goods and services (IMF, 2024[2]), (OECD, 2024[3])). The WTO and the IMF estimate the global goods trade to have declined by respectively 1.2 and 0.4% while the IMF and the OECD estimate that global goods and services trade increased by respectively 0.3 and 1% (Figure 2.1) while world output is estimated to have increased by approximately 3%. A comparison with historical growth rates of world goods and services trade—in absolute terms and in relation to output growth (i.e. the so-called trade-to-GDP elasticity)—reveals that 2023 featured one of the weakest trade performances in the last four decades[1] (Figure 2.1, Panel A). The weak trade performance in 2023 also contributed to the deceleration in the growth of the world trade-to-GDP ratio observed since the Global Financial Crisis of 2008-09 (Figure 2.1, Panel B).

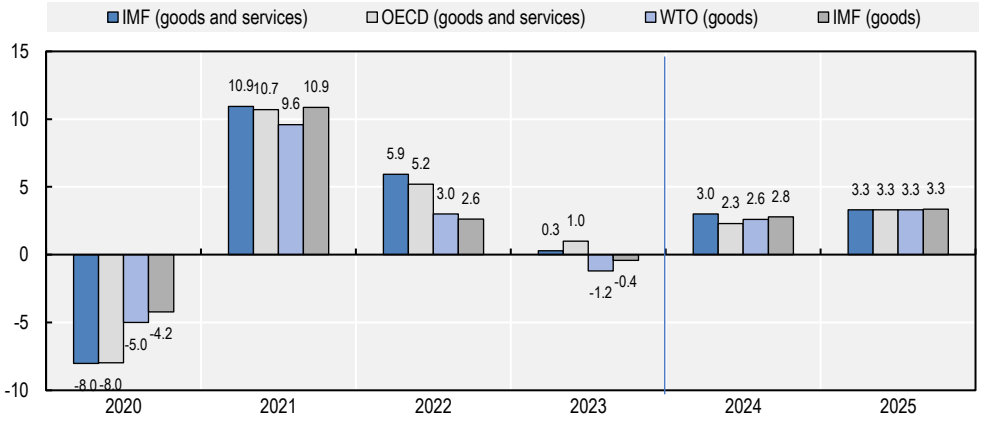
The weak trade performance in 2023 is thought to be due to a combination of cyclical macroeconomic factors. Structural factors, such as significant increases of trade costs, are not thought to be major components explaining the 2023 slow down. The plateauing of the world trade-to-GDP ratio (Figure 2.2, Panel B) suggests an increased presence of long term structural impediments to trade growth already since the Global Financial Crisis[2] but the particularly weak trade growth in 2023 is rather explained by a combination of compositional changes related to the recovery from the COVID-19 pandemic, as well as macroeconomic factors, most notably high inflation and interest rates which weighed on international trade of goods. The projections attribute the weak goods trade performance in 2023 to a combination of reductions in inventories (OECD, 2024[3]), a post-pandemic reorientation of spending from goods back towards services (OECD, 2024[3]; WTO, 2024[1]) and a weak import demand caused by inflationary pressures and high interest rates which weighed down on consumption of trade-intensive goods (WTO, 2024[1]). The better performance of services trade is explained by strong growth of travel-related services, which took longer to recover from the pandemic and grew robustly in 2023. The projections also point to considerable differences in trade performance across different goods and services and in different countries and regions (IMF, 2024[2]; OECD, 2024[3]; WTO, 2024[1]), in particular, to the positive contribution to growth of trade in 2023 of China, other dynamic Asian countries, as well as other non-OECD countries, and a relatively weak performance of trade in Europe.

Overall, the leading international trade projections released in the first half of 2024 project trade growth to normalise and grow in line with output in 2024 and 2025 (Figure 2.1, Panels A and B), close to average 2011-19 growth rates and trade-to-GDP elasticities, albeit below longer-term averages (Figure 2.2, Panel A). These projections have been upheld in recent updates to the forecasts which take into account new data on the evolution of world goods trade in the first quarter of 2024.[3]

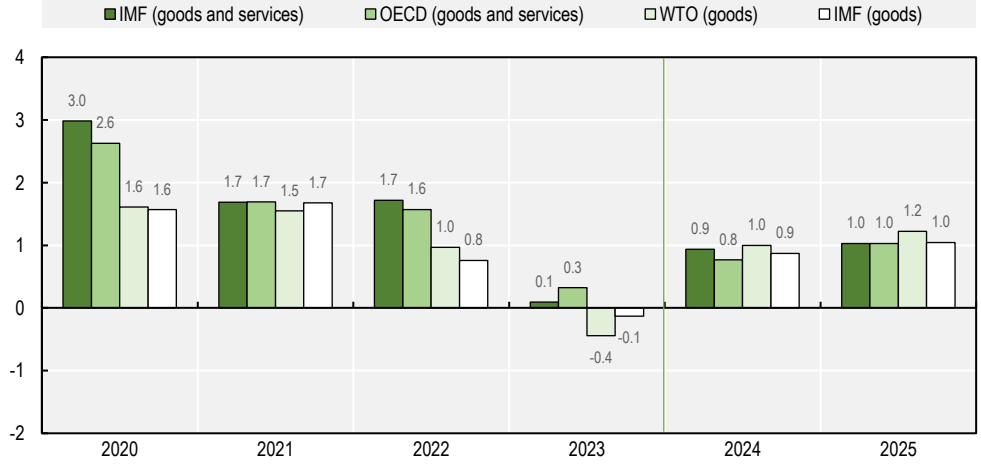
All the projections also point to downside risks associated with these projections, some of which are related to trade performance. The latter include continuation of the disruptions of maritime trade through the Suez and Panama Canals or potential disruptions of other major trade routes, impact on trade of military conflicts, growing uncertainty in international relations, increased trade and industrial policy tensions, and surging protectionism and geoeconomic fragmentation.[4] All these downside risk scenarios could significantly affect trade costs and, consequently, have negative implications for trade and long-term economic growth prospects.

Figure 2.1. Trade estimates and projections by the IMF, OECD, and the WTO (2020-2025)

Panel A. Trade growth estimate/forecast



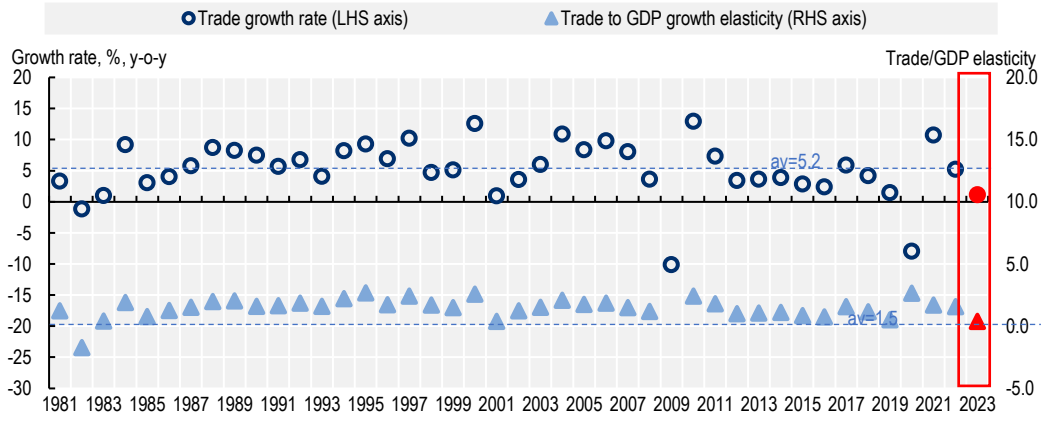
Panel B. Implied trade to GDP growth elasticity



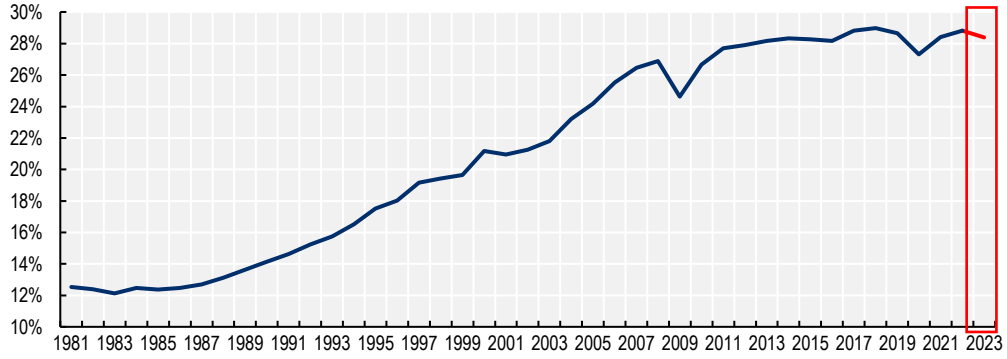
Note: All trade and output growth estimates and projections are in real terms.
Source: IMF (April 2024), OECD (May 2024) and WTO (April 2024) projections.

Figure 2.2. Evolution of global trade of goods and services relative to global GDP

Panel A. Exports growth and elasticity with respect to GDP growth (volumes)



Panel B. Exports to GDP ratio (volumes)

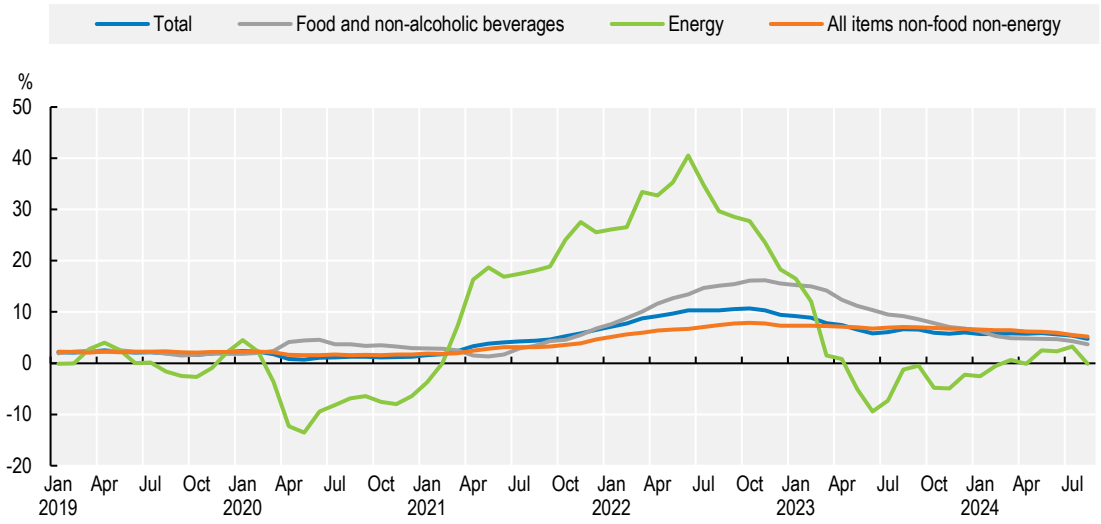


Note: Annual growth rates of volumes of world's goods and services exports and gross domestic product (GDP) in 2015 prices. In Panel A, the average lines (av) refer to the period 1980-2022. Observations in red refer to 2023.
Source: OECD Economic Outlook database.

2.2. Trade and price developments since COVID-19

The years during and following the pandemic have been characterised by particularly strong growth in prices which has significantly contributed to rising inflation. The inflation, as measured by the consumer price index (CPI), in the OECD area increased from 2.17% in December of 2019 to 10.69 % at its peak in October 2022 with energy prices and to some extent food prices driving much of the change during the post-pandemic period (Figure 2.3).[5] OECD (2021[4]) identified sharp increases in commodity prices, including energy, supply shortages, and high transportation costs as key drivers that pushed prices worldwide due to a combination of supply and demand side shocks during and post-pandemic. Significant shifts in demand towards goods and away from services during the pandemic, along with supply chain issues related to pandemic restrictions and shortages, put upward pressure on commodity prices which contributed to most of the rise in US inflation in 2021 and 2022 (Bernanke and Blanchard, 2023[5]). Arce (2023[6]) identified similar drivers of inflation for the euro area adding that the post pandemic recovery saw additional increases in demand stemming from a combination of pent-up demand for goods and services and the use of excess savings accumulated during the pandemic, while Russia's aggression on Ukraine once again added upward pressure on food and energy prices particularly just after the invasion in early 2022 (Arce et al., 2023[6]). The authors found that spike in energy prices is one reason why inflation was more persistent in the euro area compared to the United States.

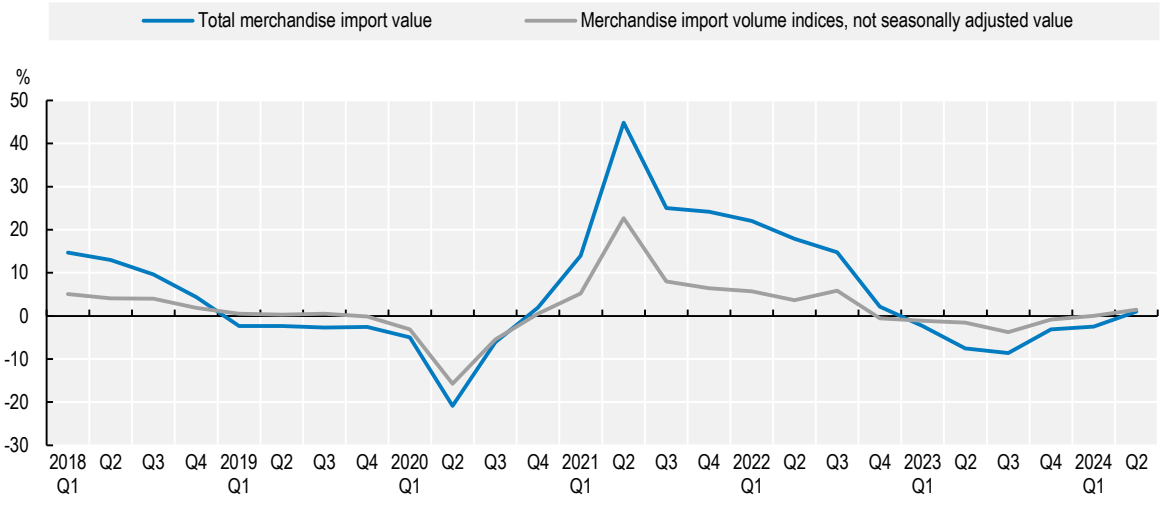
Figure 2.3. Inflation in the OECD as measured by the Consumer Price Index (CPI)



Note: Monthly series through August 2024.
Source: OECD (2024) Consumer price indices (CPIs, HICPs), COICOP 1999 extracted 17 October 2024.

The price dynamics during the pandemic era, particularly when energy and food prices were significantly elevated, resulted in the growth of merchandise trade values outpacing the growth in volume terms (Figure 2.4). The changes in the value of merchandise trade were likely heavily influenced by price developments at this time. However, as the demand between goods and services have started to normalise, i.e. reorient back towards services, and inflation has started to stabilise (Figure 2.3), growth in merchandise trade volume has been more aligned with growth in volume terms (as indicated in the last three quarters of data presented in Figure 2.4). However, the shift back towards services implies an increase in the price of services as noted by the recent *World Economic Outlook* by the IMF (2024b[7]) which might also lead to discrepancies between the volume and value of services trade.[6]

Figure 2.4. Year-on-year growth rate in world merchandise trade (value and volume terms)



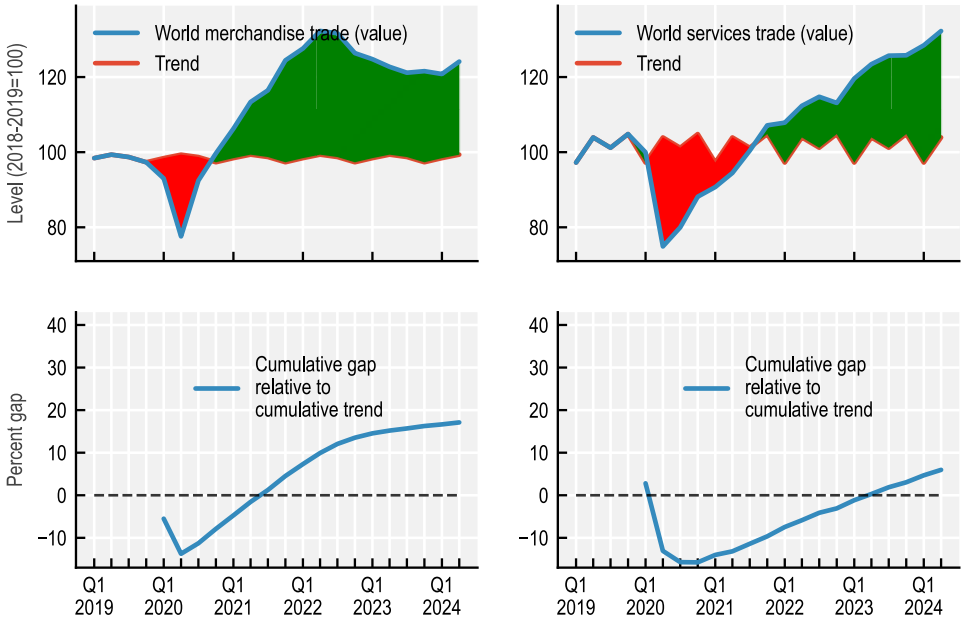
Source: WTO Stats. Accessed 17 October 2024.

2.3. Developments in goods and services trade

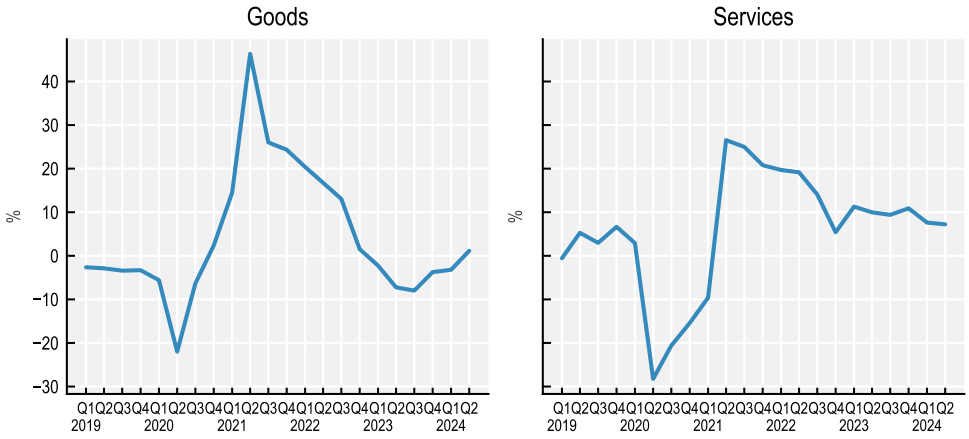
As highlighted in the recent international trade projections, 2023 was characterized by a relatively strong growth in services trade as compared to goods trade driven in part by unequal recovery of goods and services from the COVID-19 pandemic. Services trade slumped deeper than goods trade during the pandemic and recovered more slowly due to a shift of consumption toward durable goods and a more gradual lifting of some of the pandemic-related restrictions that affected trade of services such as travel or transport. Figure 2.5, Panel A shows that while trade of both goods and services have now more than made up for the losses during the pandemic, the goods trade gap closed at the end of 2021 while the gap for services closed only in the second quarter of 2023. The more recent recovery of services along with a higher sensitivity of goods trade to inflation and high interest rates helps explain, in some part, why, in 2023, services trade continued to expand (9% growth in value in 2023) while goods trade declined (-4%) (Figure 2.5, Panel B). More recently, according to the latest balance of payments data, both goods and services trade registered positive growth at the beginning of 2024 contributing to a more positive outlook for 2024 and 2025. Similarly, OECD estimates for the first quarter of 2024 registered positive growths in both goods and services trade relative to the previous quarter. Exports of merchandise trade of G20 economies increased 1.9%, driven partly by the growth in China, while preliminary estimates of G20 services exports increased 2.2%, partly fuelled by the continuing rise in international travel (OECD, 2024[8]).

Figure 2.5. Contrasting recovery of goods and services trade from the COVID-19 pandemic

Panel A. Cumulative trade gaps between actual trade values and a trend



Panel B. Year-on-year growth rates of trade values



Note: By comparing the evolution of goods and services trade during the pandemic with a pre-pandemic trends, the gap between the two accounts for the accumulation of trade foregone since the pandemic. An assumption of the 'gap' methodology is that trade in goods and services can be postponed in time, e.g. that the trade that was not possible during the pandemic (e.g. a cancelled travel or cancelled goods orders) could be realised when the pandemic restrictions were lifted.
In Panel A, the gap measures the accumulated monthly shortfall (the red part of figure) and excess (the green part of figure) of trade values (for goods) or values (for services) relative to the pre-pandemic trend. The trend is estimated using the historical method and represents the volume (for goods) or value (for services) if values were the same as in 2019, the pre-pandemic period. Latest data is for Q2-2024.
Source: IMF International Financial Statistics, based on a sample of countries representing 95% of global trade.

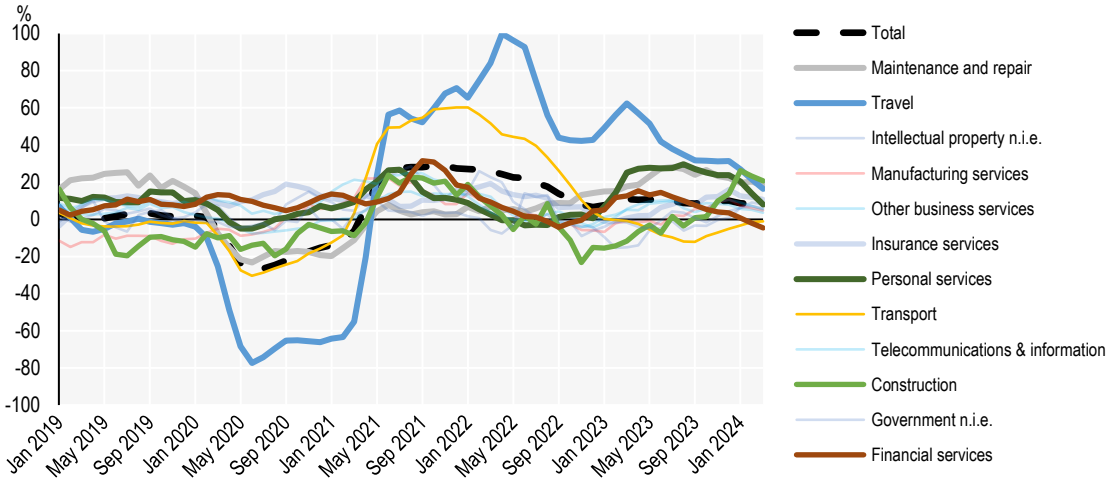
The relatively strong performance of services trade in 2023 was driven by travel, maintenance and repair, and personal, cultural and recreational services, that is, the types of services that when traded internationally require international travel and therefore were impacted relatively heavily by the pandemic travel restrictions in 2020-22 (Figure 2.6, Panel A). Services, which can be more easily delivered digitally, such as financial, insurance and other business services, were less impacted during the pandemic and grew more moderately in 2023. A gap analysis similar to that for the aggregate categories of goods and services in Figure 2.5, reveals that, despite high growth rates at the end of 2022 through early 2024 (Figure 2.6, Panel A), travel and maintenance and repair services yet to recover fully from the pandemic (Figure 2.6, Panel B). The gap is also still negative for trade in construction services, but the link to the pandemic trade restrictions is less clear as trade of this category of services had negative growth rates in the first half of 2019, and its oscillating growth in the period 2020-2023 suggests a stronger correlation with the global macroeconomic cycle.

Overall, the product structures of international trade of goods and services have changed significantly since 2020, but they are now slowly reverting to their pre-pandemic composition. The Finger-Kreinin exports similarity index,[7] calculated for G7 countries and China as a group, measures the extent to which the composition of trade has changed relative to before the COVID-19 pandemic (2019). Figure 2.7 shows that changes in merchandise trade structure just one year into the pandemic (2020) were as large as the changes that typically takes place over seven years (e.g. between 2012 and 2019). The difference in the product structure of services trade was even more dramatic, changing almost twice as much as goods trade over the same period. Moreover, the 'cumulative' version of the index, where the four years 2020 to 2023 are treated as one period to smoothen any counterbalancing changes from one year to another, confirms that the structure of G7 and China's services exports has changed more than the structure of goods exports. The stronger shift in services in the last two years is another illustration of the lagged recovery of services trade — particularly travel — relative to goods.

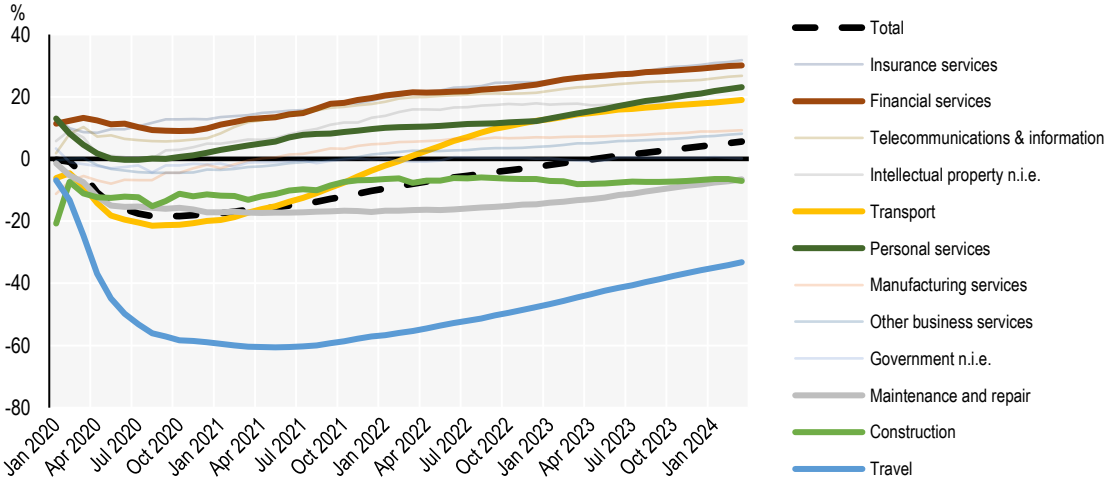
More recently, the product composition of both goods and services trade has started to shift back towards the pre-pandemic structure and the difference in size of the compositional change between goods and services has narrowed. However, relatively large differences remain even now.

Figure 2.6. Recovery of services trade by services category

Panel A. Year-on-year growth rates



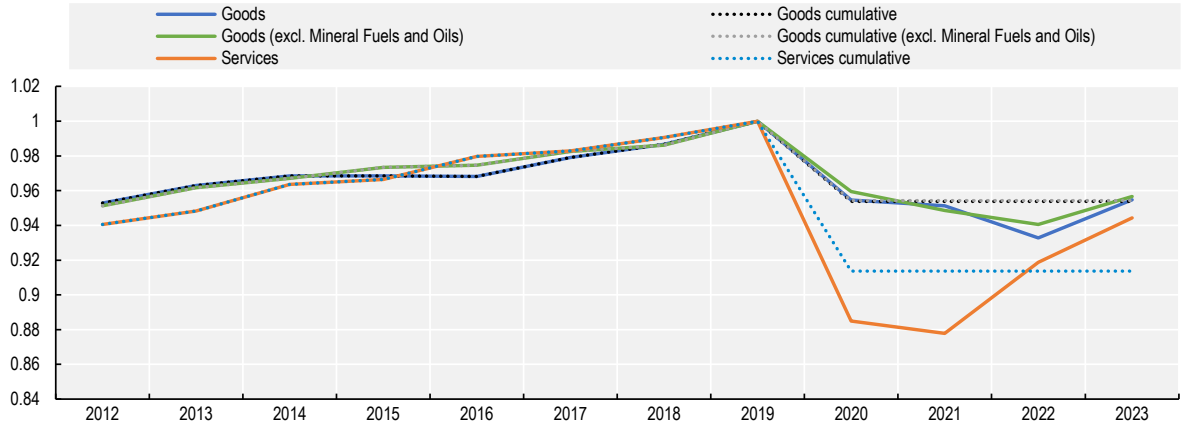
Panel B. Cumulative observed trade compared with historical values in 2018-2019



Note: The "Personal services" category includes "cultural and recreational services". Included countries: Belgium, Canada, Czechia, Denmark, Estonia, Finland, Germany, Greece, Hungary, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Poland, Portugal, Slovak Republic, Slovenia, Sweden, Türkiye, United Kingdom, United States, Brazil, China, India, Russia, Bulgaria, Malta, Mongolia, Pakistan, Romania, Serbia, Ukraine (85% of total trade in 2018-2019). Latest data: July 2024.
Source: WTO extracted November 2024.

Figure 2.7. Changes in the structure of goods and services trade for G7 and China as of the end of 2023

Finger-Kreinin index of similarity of export structure across products (1 = structure identical to 2019)



Note: The index, which varies between 0 and 1, is computed using product shares of total export value of G7 countries and China. A value of 1 indicates the group exported products in the same proportions as in the reference year 2019 and a value of 0 means that there were no common products exported in the two periods. A value of 0.5 can be approximately interpreted as a 50% overlap in export structures between the two periods. The index covers 2-digit HS categories for goods and twelve broad services categories (see Figures 2.8 and 2.9 for the list of goods and services). Manufacturing services on physical inputs owned by others are not reported by the United States and Canada for any of the covered years. Construction services are missing for Germany in 2012 and 2013. Maintenance and repair services n.i.e. is missing for China between 2012 and 2014. Sectors missing information are considered 0 in the computation. The 'Cumulative' indices sum exports from 2020 to 2023, treating the post pandemic years as one period to assume away any counterbalancing changes. Series 'Goods (excluding Mineral Fuels and Oils)' excludes HS chapter 27 Mineral fuels, mineral oils, and products of their distillation.
Source: OECD calculations based on UN Comtrade data and ITC Trade Map data for France, Italy, and Japan for 2023 (goods) and IMF Balance of Payments (services). Data extracted on 25 April 2024.

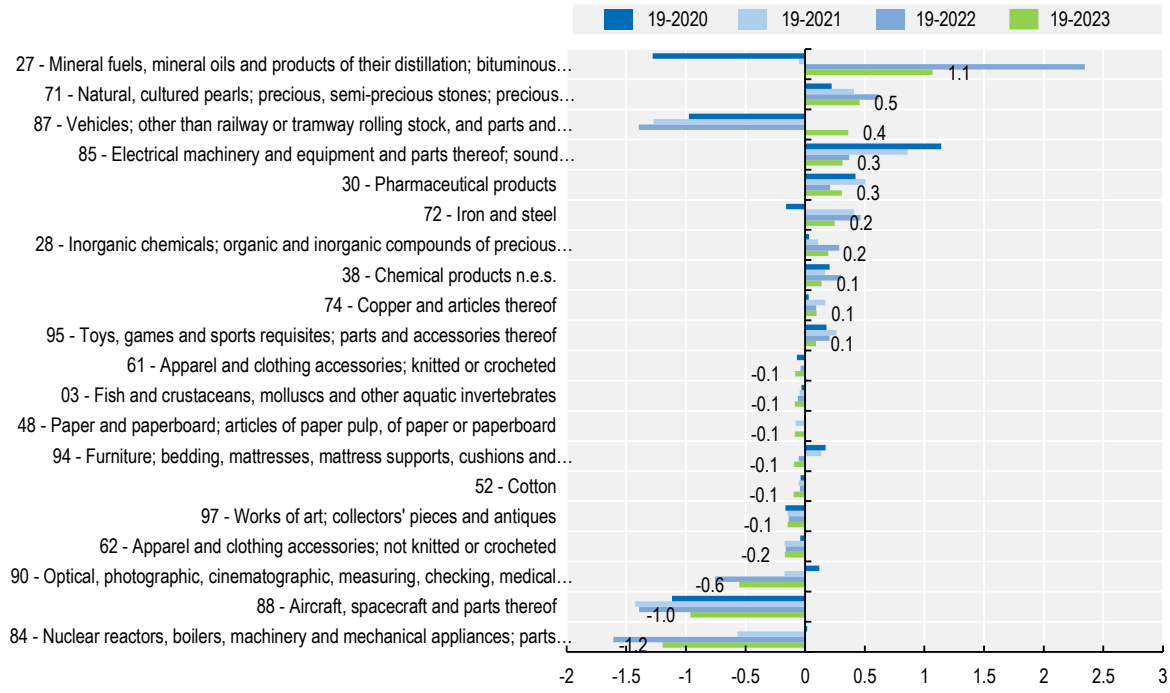
A closer look at the composition of goods and services trade in Figure 2.8 and Figure 2.9, respectively, provides more information on the drivers of changes in the structure of trade. Energy (HS27) and commodity products (HS99) are among the types of goods driving the structural changes over the last few years. Some of the changes related to these products are certainly due to sharp increases in commodity prices already during the COVID-19 pandemic and, particularly, after Russia's invasion of Ukraine in 2022, since when they have only partially come down, remaining above pre-pandemic levels (see Section 2.6).

Energy products apart, 2023 marks a heavy increase in trade of vehicles (HS87) where the change in shares of total exports from the 2019 switched from a decline in 2022 (-1.5 percentage points) to an increase in 2023 (0.4 percentage points).[8] The growth in trade of passenger cars in 2023 reflects pent up demand that has been realised after the pandemic-related production and delivery delays in prior years (see also Section 4).[9] Electrical machinery and equipment (HS85) continue to account for a larger share of total exports compared to 2019 but the increase after the pandemic has diminished over the years, while aircraft products (HS88) continue to make up a smaller share of total goods exports.

As suggested by the Finger-Kreinin index, changes in the share of total exports among the service sectors were more radical, but the big shifts were accounted for by only a handful of sectors (Figure 2.9). The largest change was for travel services during the period of lockdowns, which lost 12 percentage points in 2021 relative to 2019. As the sector recovered, the difference in share from the pre-pandemic period gradually decreased but its share of exports is still below 2019 levels.[10] As of 2023, export shares of other business services (SJ), telecommunication, communication and information (SI), and insurance (SF), which fared well during the pandemic period, remain above their shares in 2019. For most other sectors, the changes over the years have been small and most are now close to their pre-pandemic shares.

Figure 2.8. Goods with largest gains and losses in G7 and China's export shares

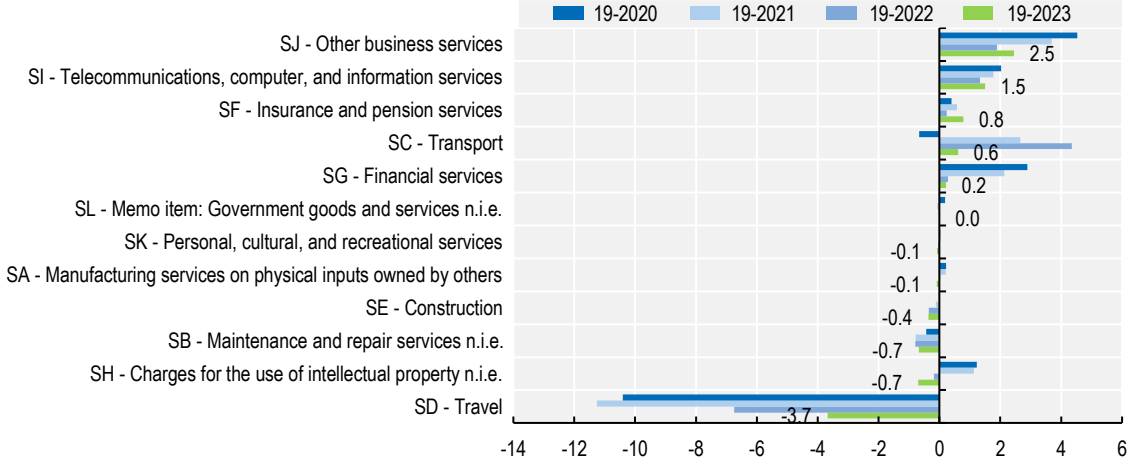
Percentage point increase in export share since 2019, top-10 products with largest increases and decreases in export share between 2019-23



Note: Shows percentage point changes in export shares of G7 countries and China for ten merchandise sectors (2-digit HS) with the largest increases and deepest decreases between 2019 and 2023. HS code 99 ("Commodities not specified according to kind") is excluded from the graph.
Source: OECD calculations based on UN Comtrade data and ITC Trade Map data for France, Italy, and Japan for 2023.

Figure 2.9. Services sectors with largest gains and losses in G7 and China's export shares

Percentage point increase in export share since 2019

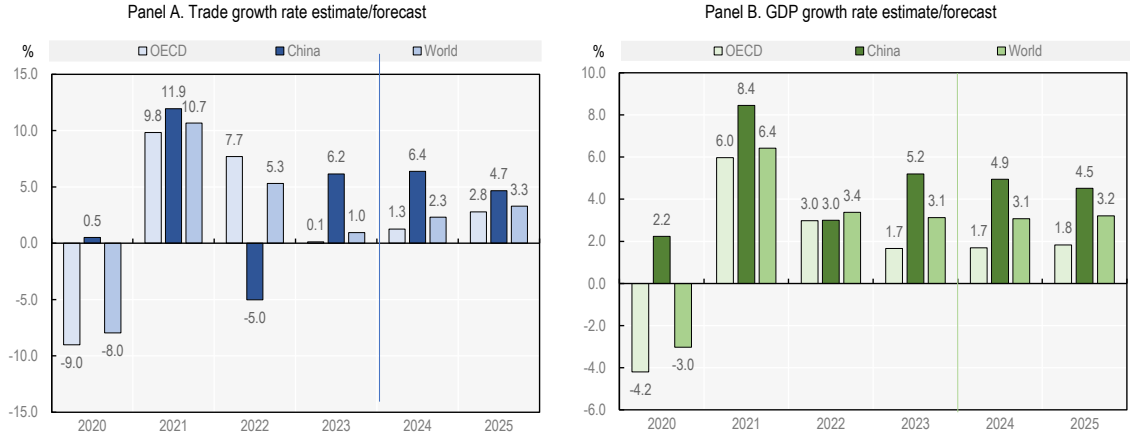


Note: Shows corresponding change in export shares for all broad categories of commercially traded services reported in the source data. Manufacturing services on physical inputs owned by others are not reported by the United States and Canada on the period.
Source: OECD calculations based on IMF Balance of Payments (data extracted on 25 April 2024).

2.4. China's trade performance

As the world's largest exporter and the second largest importer of merchandise products, China's macroeconomic and trade performance is a major factor influencing global trade. China's relatively strong trade performance in 2020 and 2021 was hampered in 2022 by the country's strict COVID-19-related restrictions. In 2023, after the phase out of those measures, China's trade and output growth again outpaced those for the OECD area and the world, as shown by the latest estimates from the *OECD Economic Outlook* (OECD, 2024[3]) (Figure 2.10). In 2023, China's imports of goods and services grew faster (8.6%) than exports (4.1%) reflecting weak import demand from China's trade partners.

Figure 2.10. China's trade of goods and services and GDP growth in the period 2020-2025

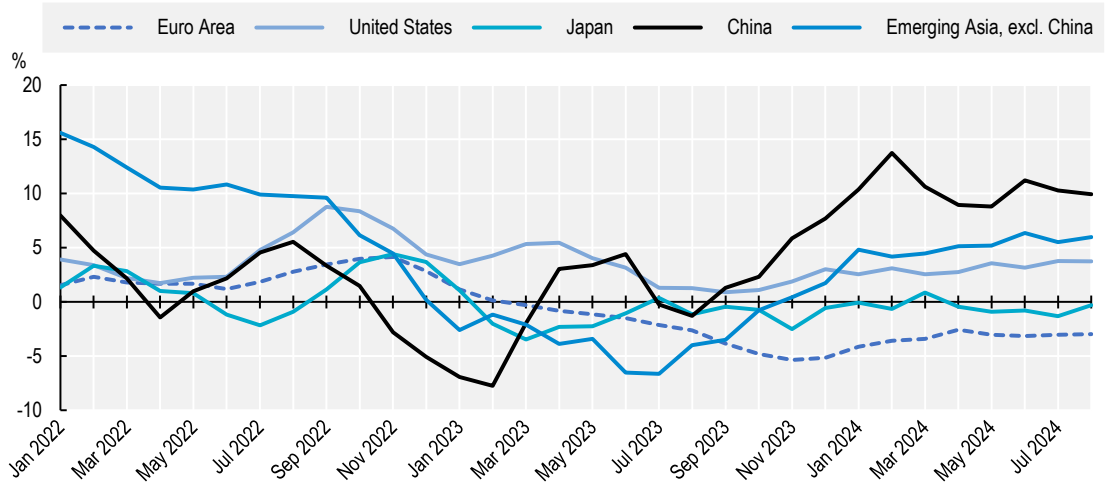


Note: All growth rates adjusted for price movements. Forecast for 2024 and 2025.
Source: OECD Economic Outlook 115.

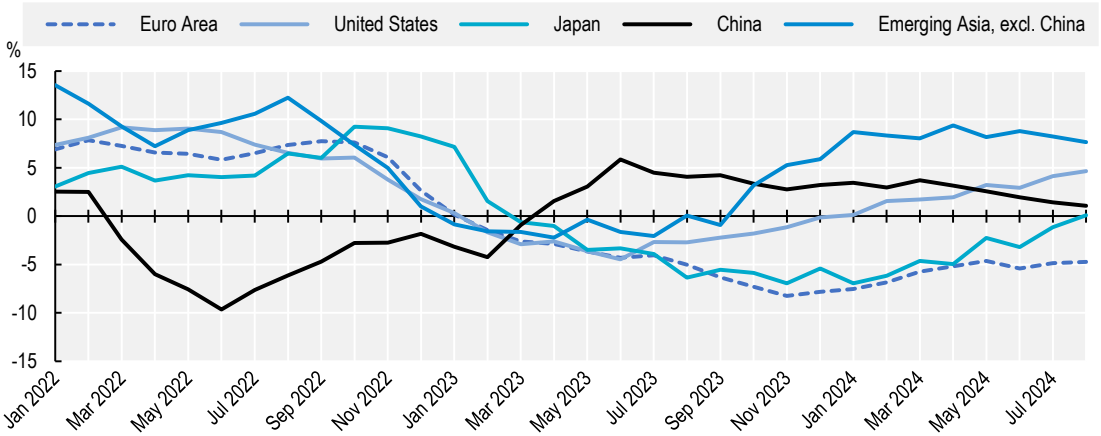
China's trade growth was also markedly volatile during the course of 2023, as illustrated in particular by the intermittent periods of high and low growth of merchandise exports (Figure 2.11, Panel A), but there are concerns whether the relatively strong growth recorded at the end of 2023 and the first half of 2024 will be sustained. Real merchandise export growth seems to have already started to slow mid-way through the first quarter of 2024. On the merchandise imports side, China recorded relatively low growth rates at the beginning of 2023 (Figure 2.11, Panel B) but, similarly to exports, the trend reversed in the second half of the year, before slowing again at the end of 2023 and in early 2024. Since the second quarter of 2023, China's real imports growth has been positive and more dynamic than that of the largest OECD economies but slower than that of other emerging Asian economies. While it remained positive in mid-2024, it has declined gradually since the beginning of the year. This may be an indication of China's economic slowdown which could have significant implications for global trade and the world economy.

Figure 2.11. Comparison of China's recent merchandise trade growth with other main economies

Panel A. Year-on-year change in export volume



Panel B. Year-on-year change in import volume



Notes: Four-month moving average of year-on-year growth rates on monthly trade statistics calculated using seasonally-adjusted volume data.
Source: CPB World Trade Monitor, October 2024 release.

The year 2023 also saw some stark changes in the partner and product structure of China's trade. The declines in the value of China's exports to the United States (-13%), the European Union (-10%), Japan (-9%) and Korea (-8%) contrast with the 46% increase for exports to Russia and, albeit much less so, to Mexico (6%) (Table 2.1, Panel A). The changes in China's bilateral exports coincided with falls of export values across most of China's key export products, apart from exports of vehicles which grew by 29% (Table 2.1, Panel C). In 2023, China also imported less in value terms from ASEAN and most of its major OECD partners [Korea (-19%); Japan (-13%); United States (-7%) and European Union (-1%)], while it imported more from Russia (14%) and other major commodity suppliers such as Brazil (13%) and Australia (10%) (Table 2.1, Panel B). The shifts in import shares appear broadly consistent with the pattern of changes across China's top 10 imported products which feature increases in import values for key commodities (Table 2.1, Panel D). To some extent, the shifts in product and important partner shares can be explained by a combination of an unequal recovery of China and its trading partners from the pandemic and changes in commodity prices (see also Section 2.6). However, these changes may also be an indication of a more structural re-orientation of trade across China's trade partners and warrant further monitoring.

Table 2.1. China's merchandise trade: Top 10 products and partners in 2023 at HS2-digits

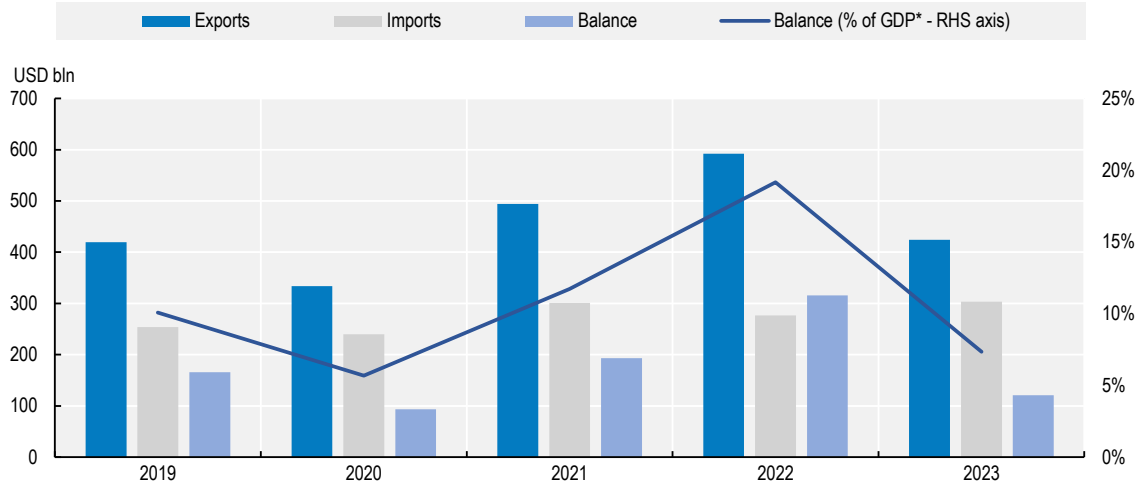
Panel A. Exports by partner				Panel B. Imports by partner			
Country	Value (USD bln)	Growth rate		Country	Value (USD bln)	Growth rate	
	2023	2022-23			2023	2022-23	2019-23
ASEAN	537	-6%	49%	ASEAN	390	-5%	38%
United States	506	-13%	21%	European Union	283	-1%	2%
European Union	504	-10%	18%	Chinese Taipei	200	-17%	16%
Hong Kong (China)	279	-8%	0%	United States	166	-7%	36%
Japan	158	-9%	10%	Korea	163	-19%	-6%
Korea	151	-8%	36%	Japan	161	-13%	-6%
India	119	0%	58%	Australia	155	10%	30%
Russia	111	46%	125%	Russia	128	14%	112%
Mexico	82	6%	77%	Brazil	122	13%	54%
United Kingdom	79	-3%	27%	Saudi Arabia	64	-17%	18%
Panel C. Exports by HS2 product				Panel D. Imports by HS2 product			
Country	Value (USD bln)	Growth rate		Country	Value (USD bln)	Growth rate	
	2023	2022-23			2023	2022-23	2019-23
85-Electrical machinery	905	-6%	35%	85-Electrical machinery	552	-15%	11%
84-Nuclear reactors	515	-7%	23%	27-Mineral fuels	513	-3%	49%
87-Vehicles	194	29%	160%	26-Ores, slag and ash	237	6%	45%
39-Plastics	135	-7%	59%	84-Nuclear reactors	198	-2%	4%
94-Furniture	125	-5%	26%	71-Natural pearls, precious stones and metals	114	10%	89%
73-Iron or steel articles	100	-10%	44%	90-Optical, […] instruments	78	-6%	-21%
95-Toys, games and sports requisites	91	-13%	45%	12-Oil seeds and oleaginous fruits	71	3%	76%
61-Apparel (knitted)	84	-8%	18%	87-Vehicles	71	-13%	-6%
29-Organic chemicals	78	-24%	37%	74-Copper	63	-9%	55%
62-Apparel (not knitted) or crocheted	72	-6%	8%	39-Plastics	62	-17%	-13%

Source: General Administration of Customs of the People's Republic of China.

2.5. Developments in Russia's international trade

The marked increases in the shares of Russia as a destination for China's goods exports and as a source of China imports are also an illustration of the large changes in Russia's international trade and changes in global trade patterns that have been taking place since its full-scale invasion of Ukraine in February 2022. In 2023, the value of Russia's good exports decreased by approximately USD 168 billion while imports increased by some USD 27 billion, resulting in a USD 195 billion decrease in Russia's goods trade balance which was equivalent in value to 12% of the country's pre-invasion GDP (Figure 2.12). In 2023, the goods trade balance was also USD 72 billion (or 37%) lower than in 2021 and USD 45 billion (or 27%) lower than in 2019. To some extent, the significant decline in Russia's goods trade balance in 2023 was driven by a high base effect of soaring energy prices following Russia's invasion of Ukraine, which inflated the value of Russia's goods exports in 2022. But these changes also reflect the continuing effects of the far-reaching trade and other economic sanctions on Russia implemented by a coalition of countries (OECD, 2023[9]).[11]

Figure 2.12. Exports and imports of goods and goods trade balance of Russia, 2019-2023

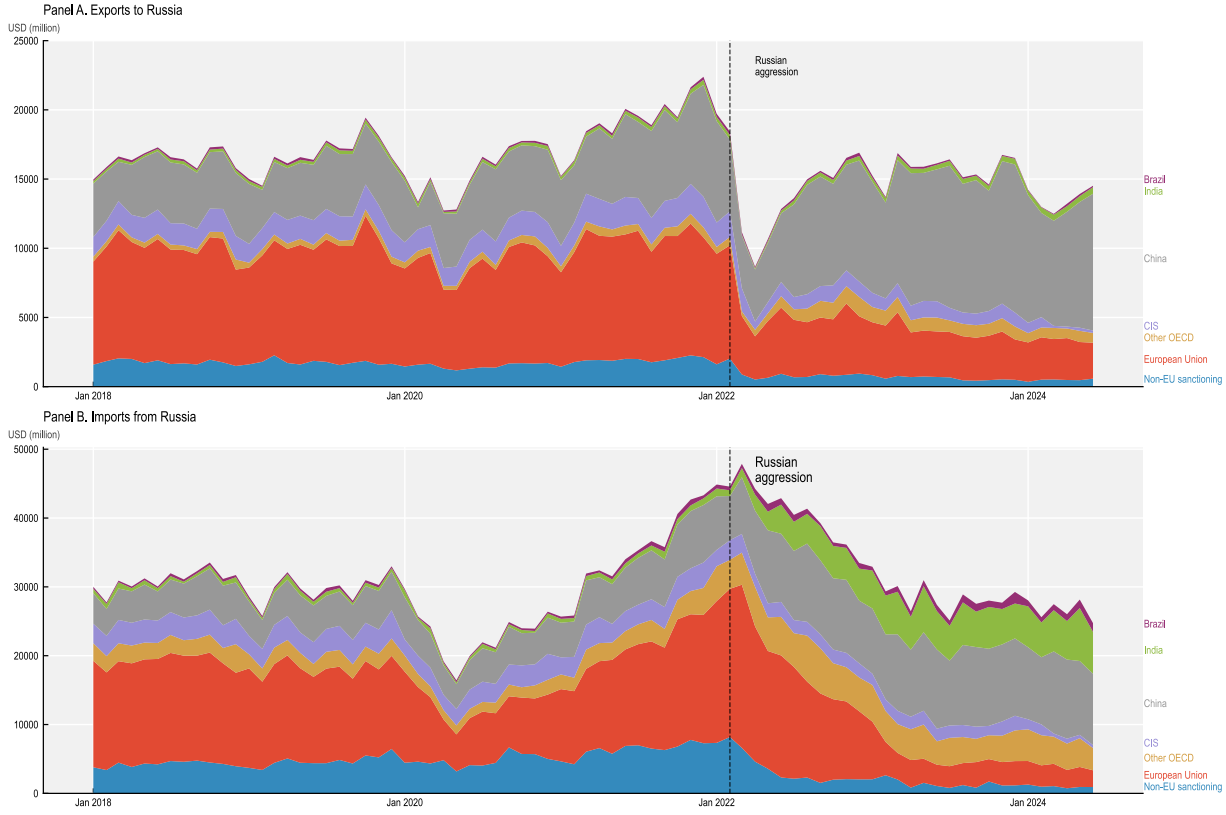


Note: *Balance on goods trade is expressed as % of Russia's GDP in 2021.
Source: IMF Balance of Payments Statistics.

The effects of sanctions can be seen in the changes in Russia's trade levels and partner shares (Figure 2.13). In terms of products structure, before the invasion, energy products (HS27) accounted for some 42% of Russian exports and were exported mainly to the European Union. Jewellery and precious metals (HS71) accounted for further 9% and were exported mainly to the United Kingdom while iron and steel (HS71) accounted for 4.7% and were exported mainly to European Union and Türkiye. Agricultural products (mostly wheat) accounted for 2.7% and were exported chiefly to European Union and China. Since the invasion, Russia has been exporting visibly less to the European Union and other sanctioning countries while at the same time increasing exports to China and India (Figure 2.13, Panel B). Primarily, the increase in exports to India and China has been accounted for by energy products as the two countries took advantage of buying Russian oil at a discount. Russia has also been expanding natural gas sales to China, although this has been limited by the capacity of the gas pipelines between the two countries, with gas export volumes smaller than those previously sent to Europe.

On the import side, before the invasion, Russia's imports came mainly from Europe and consisted of high-tech products, such as ICT equipment, electronics, and automotive products. Since the invasion, exports from the European Union and other sanctioning OECD countries to Russia have declined significantly (by some 59% and 64% respectively), while exports from China, India, and other non-sanctioning OECD countries, predominantly Türkiye, have grown significantly (Table 2.2).

Figure 2.13. Reconfiguration of merchandise trade of Russia



Note: Russian trade is proxied by partner countries' reporting up to March 2024 (i.e.it does not add up to 100% of total official Russian trade). Non-EU sanctioning: Canada, Switzerland, United States, Great Britain, Australia, Japan, Norway, New Zealand. European Union: EU 27. Other OECD: Türkiye, Mexico, Israel. CIS: Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan. Latest data: June 2024.
Source: UN Comtrade, Chinese Customs Statistics, ITC Trademap.

Table 2.2. Percentage change in value of trade in the period July 2023-June 2024 with respect to July 2020-June 2021

	Non-EU sanctioning	European Union	Other OECD	CIS	China	India	Brazil	All countries covered*
Imports from Russia	-81%	-69%	90%	-57%	105%	972%	212%	1%
Exports to Russia	-71%	-63%	52%	-64%	89%	58%	-23%	-16%

Note: * Russian trade is proxied by partner countries' reporting (i.e.it does not add up to 100% of total official Russian trade). Non-EU sanctioning: Canada, Switzerland, United States, Great Britain, Australia, Japan, Norway, New Zealand. European Union: EU 27. Other OECD: Türkiye, Mexico, Israel. CIS: Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan.
Source: UN Comtrade, Chinese Customs Statistics, ITC Trademap.

G7 countries and the European Union, which led the establishment of sanctions, continued to reduce trade ties with Russia in 2023. G7 imports from Russia exhibited strong declines in both volume and value terms for all products with the exception of cereals, fertiliser, metals and inorganic chemicals, products where Russia is an important exporter (Figure 2.14, Panel A). G7 cereal imports from Russia increased significantly both in terms of value (77%) and volume (67%) while G7 fertilisers imports exhibited a smaller increase (13% in value terms and 16% in volume terms). For metals and inorganic chemicals, while import volumes have declined, the increase in prices of uranium and copper for instance, resulted in an increase

in imports in value terms. On the export side (Figure 2.14, Panel B), there have been significant drops in exports to Russia of strategic products such as machinery, vehicles, electrical machinery, and aircrafts, while the decline in exports has been less pronounced for pharmaceuticals and wearing apparel.

Figure 2.14. Trade between G7 and Russia continue to fall across most products

Change in G7-Russia total trade in 2023 relative to 2021

Note: Based on value and volume trade data of G7 countries at the HS 2-digit level. The charts present the top 35 HS 2-digit products in value terms which covers 99% and 94% of total value of imports and exports respectively. Volume change based on products for which measurements in kilograms were available.
Source: UN COMTRADE

An additional sanction included a price cap imposed by a coalition of sanctioning countries which forbade insurance and financial companies to provide services to ships transporting Russian oil that is sold at a price higher than USD 60 per barrel.[12] Initially, prices of oil exported from Russia dropped to around USD 60 per barrel at the start of the application of sanctions in December 2022 (Figure 2.15 Panel A). However, the difference between the world price (proxied by the Brent price in Figure 2.15) and Russian prices (Urals and ESPO) have progressively faded through the course of 2023 (Figure 2.15 Panel B). The price of Russian crude oil dropped vis-à-vis the world prices following the second phase[13] launched by the United States in February 2024, before climbing again in April. In November 2024, USD 9.9 and USD 3.6 difference between the world and Russian prices for, respectively, the Urals and ESPO prices, suggesting only a partial pass through of the sanction to Russian oil prices. [14]

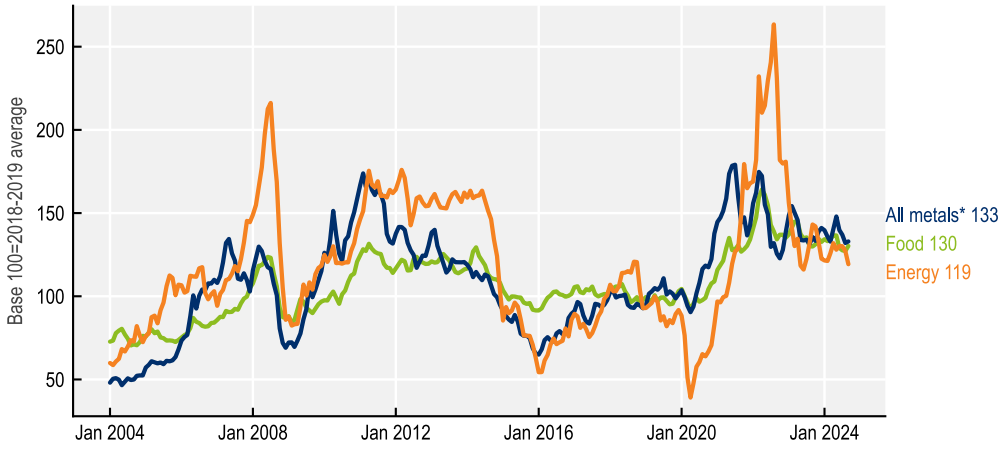
Figure 2.15. Crude oil price (United States vs Russia): Recent fading effect of sanctions on oil price cap

Note: ESPO: Eastern Siberia-Pacific Ocean. Daily data up to 4 November 2024.
Source: London Stock Exchange Group (LSEG).

2.6. Effects on commodity markets of recent trade disruptions

In 2023, commodity prices have continued their decline, albeit from historically high levels following the COVID-19 pandemic and Russia's invasion of Ukraine. At the beginning of 2024, commodity prices remained higher than pre-pandemic levels despite subdued global GDP growth in 2023 (Figure 2.16). The high level of commodity prices reflects several broader factors such as a tightening of supplies, geopolitical tensions, and greater demand for industrial metals related to the green-energy transition (World Bank Group, 2024[10]). As of September 2024, the metal price index was up 33% from the average pre-pandemic prices,[15] while the food price index was up 30% and energy prices 19% (Figure 2.16). Within each index there are different behaviours among its components driving the changes.

Figure 2.16. Commodity prices are declining, but remain high

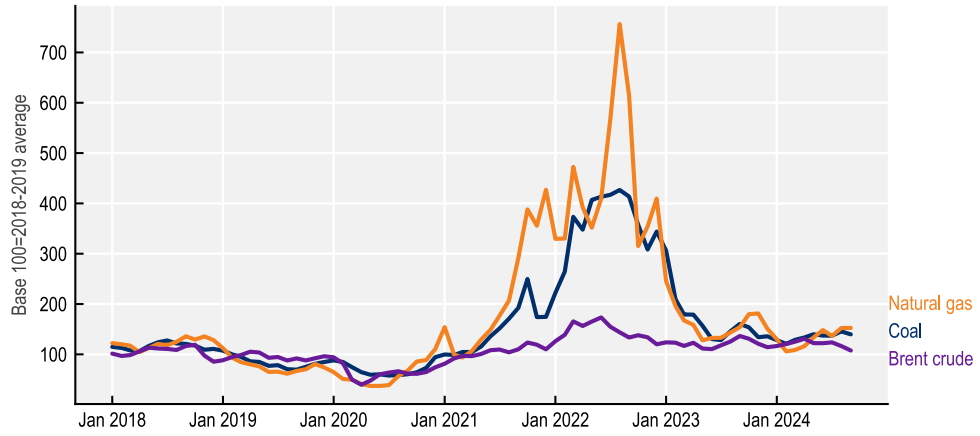


Note: *Excluding gold. Numbers in the label are the value of the index for each commodity in June 2024. All metals include base metals, silver, palladium, platinum. Energy includes crude oil (petroleum), coal, and natural gas and propane. Food includes bananas, cereal, citrus-fruit, dairy products, legumes, meat, non-citrus fruit, seafood, sugar, vegetables, and vegetable oils. See the IMF technical documentation for more information.
Source: IMF Primary Commodity Price System (accessed 16 October 2024, last data point September 2024).

The significant recent volatility in the energy prices has been driven by the price of natural gas and at times coal which faced increasing demands as governments favoured coal-generated energy in the presence of high natural gas prices (Figure 2.17). Currently, energy prices remain lower than historic peaks and the price spread between the three energy types has narrowed to normal levels. An unseasonably mild winter in 2023 helped to keep natural gas markets stable over the heating season in the Northern Hemisphere. However, concerns about high energy prices remain in the context of congestions and delays related to transportation disruptions and on-going military conflicts.

Liquefied natural gas (LNG) flows have been affected by congestion in two strategic maritime shipping chokepoints, Panama and Suez Canals (see also Section 3). The impact on LNG freight rates and supply have been limited for the moment but long-term issues of congestion could put upward pressure on prices (IEA, 2024[11]). Moreover, at the end of 2024 a five-year agreement governing the transit of Russian gas to Europe via Ukraine will expire and there are no new negotiations underway.[16] This could make delivery to landlocked European countries more difficult. In addition, recent Russian attacks on underground gas storage facilities in Ukraine, which has more storage capacity than any country in Europe and has been providing the European Union with large scale gas storage facilities since 2022, has put traders on alert to high volatility and supply disruptions.[17]

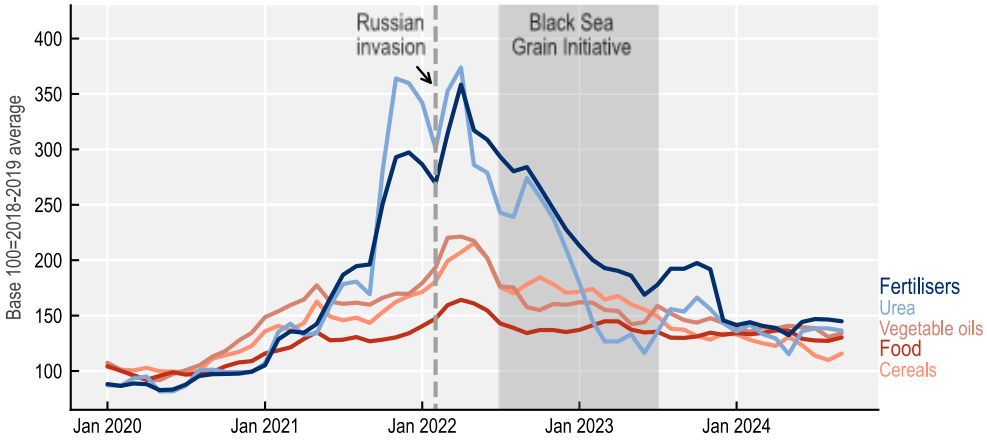
Figure 2.17. Energy prices have declined from recent historic levels



Source: IMF Primary Commodity Price System (accessed 16 October 2024, last data point September 2024).

Food and fertiliser prices have declined considerably from the peaks reached following Russia's invasion of Ukraine but are also still above pre-pandemic levels (Figure 2.18). The suspension of the Black Sea Grain Initiative in July 2023 caused a temporary increase in the price of vegetable oil, fertiliser and urea but so far has had minimal effects as Ukraine has been able to continue exporting through the seaborne corridor and new overland routes (World Bank Group, 2024[10]). Since the beginning of the harvest last August, more than 700 ships have passed through the sea corridor largely passing also through the Suez Canal and the Red Sea despite recent disruptions on this route due to Houthi rebels attacks.[18] The drop in fertiliser prices at the beginning of 2024 reflects increased production and lower prices of natural gas and coal prices, which are important inputs into fertiliser production (World Bank Group, 2024[10]).

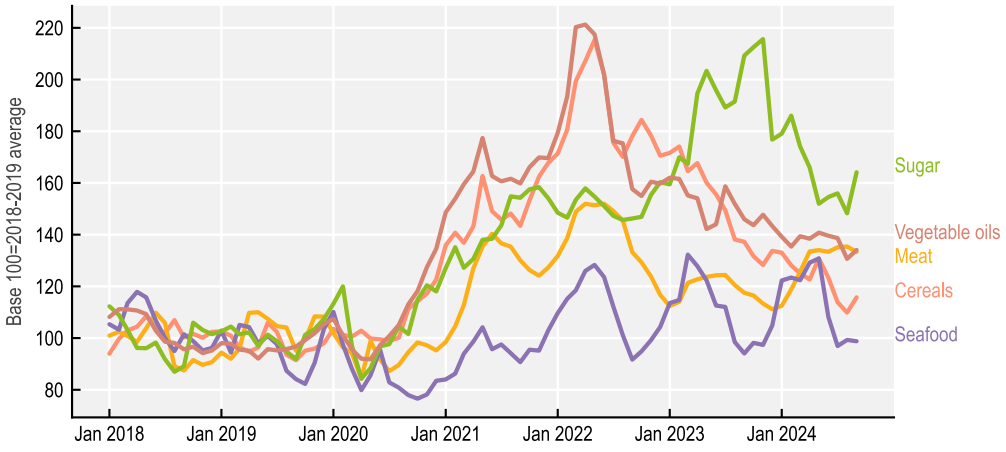
Figure 2.18. Food and fertiliser prices remain high



Source: World Bank's Pink Sheet for fertiliser prices; IMF Primary Commodity Price System (PCPS) for food prices (accessed 16 October 2024, last data point September 2024).

While the aggregate food price index has remained stable, albeit high, in recent months, trends vary by different food commodities (Figure 2.19). The price of vegetable oils, cereals, and meats have all declined since their peaks in early 2022. Sugar prices, on the other hand, peaked sharply at the end of 2023 and have remained 64% above pre-pandemic levels mainly due to supply issues. The increase in the sugar price is related to *El Niño* which has weakened the monsoon season and brought dryness across parts of South and Southeast Asia resulting in an under production in major sugar producing countries (India and Thailand).[19] Brazil who struggled with production in previous years, experienced port bottlenecks and logistical hurdles since October 2023 which have hampered sugar exports (USDA Foreign Agriculture Service, 2023[12]). Nevertheless, increased production in Brazil along with dry weather conditions in the country, allowed cane harvesting and processing to continue through the end of the year[20] and for sugar exports to leave the port faster than expected, and caused sugar prices to drop at the beginning of 2024 (World Bank Group, 2024[10]).

Figure 2.19. Trends in food prices vary by commodity

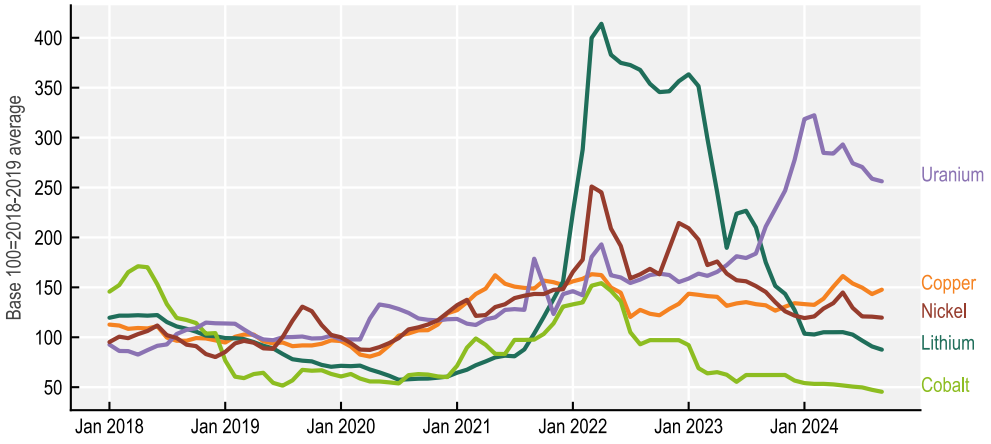


Source: IMF Primary Commodity Price System (accessed 16 October 2024, last data point September 2024).

The Russian invasion of Ukraine triggered an additional increase in metal prices in early 2022 although prices of several metals declined in the second half of 2022 and in 2023 (Figure 2.20). One exception is uranium, a key component to produce nuclear energy and where Russia is a main exporter. The over 200% increase of uranium prices over the last five years is due to an increase in energy demand following the re-opening of the global economy after the pandemic as well as to Russia's invasion of Ukraine after which prices took a sharp increase. More recently, fear of supply risk from Kazakhstan pushed prices up further.[21] The pressure to cut emissions and belief that nuclear energy would make the energy transition safer and cheaper is expected to drive uranium demand higher in the coming years.[22] Costs of inputs used in uranium production[23] and their availability may put additional upward pressure on prices.

The 2023 decline in lithium prices are related to the electric vehicles (EV) demand, particularly in China. A key raw material used in electric car batteries, lithium's price has declined 79% from its peak in early 2022 as industry capacity has outpaced actual demand and demand expectations ease as car producers cut their production target plans.[24] In particular, sales in China, the world's largest EV market, have slowed down growing only 30%, after increasing more 250% in 2021 and 100% in 2022, following the end of an 11-year subsidy scheme on EV purchases in 2022.[25]

Figure 2.20. Prices of selected metals



Source: IMF Primary Commodity Price System (accessed 16 October 2024, last data point September 2024).

Notes

[1] In the period 1980-2023, only 1982-1983, 2001, 2009, and 2019-2020 show weaker real growth of world trade in goods and services relative to growth of world GDP.

[2] The plateauing in the world trade-to-GDP ratio likely reflects a combination of factors such as maturing of global value chains (and thus their slower growth) but also reduced commitment to multilateral trade liberalisation, as well as rising geopolitical and security concerns, and barriers to international trade and FDI.

[3] A July 2024 projection update from the (IMF, 2024b[7]) notes an uptick in world trade growth in the first quarter of 2024 but argues that it is expected to moderate later in the year due to subdued manufacturing activity, leaving the earlier trade projections for 2024-25 unchanged. Also in July 2024, the WTO (2024[26]) released its first estimates of world trade volume growth for the first quarter of 2024 and commented that these figures are also broadly consistent with its earlier (April 2024) world trade growth estimates for 2024 and 2025. The source states that if the current pace of expansion in the first quarter of 2024 continues through the end of this year, trade volume for the whole of 2024 will be 2.7% higher than in 2023 (as compared to 2.6% for good trade projected by the WTO in April 2024). The *OECD Interim Economic Outlook* released in September 2024 (OECD, 2024[25]) describes goods and services strengthening especially in the second quarter of 2024; however, this boost in trade may have come from earlier-than-usual orders for the peak season in advanced economies to avoid congestions later in the year.

[4] For example, both the IMF (2024b[7]) and WTO (2024[27]) report on signs of fragmentation of world trade along geopolitical divisions.

[5] See Subsection 2.6 for a discussion on recent developments of individual commodity prices.

[6] Complete merchandise and services trade at the detailed product level is only available in value terms.

[7] The Finger-Kreinin index is a measure of export similarity. In the analysis, it is used to measure the similarity of the "G7 + China" region's export structure in different periods compared to the region's trade structure in 2019. The index ranges from 0 to 1, where an index value of 1 indicates perfect similarity, meaning that region exported the same products in the same proportions during the given period as it did in 2019. A value of 0 indicates that region is exporting an entirely different set of goods. The lower the value, the greater the difference in export structure of the given year compared to 2019, before the COVID-19 pandemic.

[8] Looking more into details in the geographic composition of trade for automotive products (HS87), between 2021 and 2023, the share of China's exports increased from 13.5 to 17% gaining 3.5 percentage points while European Union's share dropped from 29 to 27 percent loosing 2 percentage points among top 10 exporters (European Union, China, United States, Mexico, Japan, Canada, Great Britain, Türkiye, South Africa, Brazil). Based on UN Comtrade.

[9] See https://think.ing.com/articles/global-car-market-outlook-hitting-speed-bumps/.

[10] These figures, which are averages for the G7 group and China mask significant heterogeneity in changes across individual exporting and importing countries: Japan tripled the share of exports in travel services in 2023 (among top 10 exporters). Chinese's share in imports fell from 35% pre-covid (2019) to 24% in 2022 and gained again 4 percentage points during 2023 to 28% among top 10 importers. Based on WTO services trade database.

[11] Also note that, despite some measures taken by Russia to defend the value its currency (i.e. conversion of Russian export sales into rouble, prohibition of bank transfers, quoting export of Russian gas in Russian rouble), the RUB/USD exchange rate was at a historical low level 0.01 in November 2024. Factors driving the decrease in demand for Russian currency in 2023 include lower export proceeds and low levels of foreign inward investment. The weak rouble constrains Russia's ability to import and adds more challenges to its value chain participation in non-energy related sectors that require foreign inputs.

[12] See https://finance.ec.europa.eu/system/files/2024-01/guidance-russian-oil-price-cap_en.pdf.

[13] See https://home.treasury.gov/news/featured-stories/phase-two-of-the-price-cap-on-russian-oil-two-years-after-putins-invasion.

[14] The recent level of world prices (e.g. USD 72 per barrel on 6 November 2024) and the price cap of USD 60 for Russian crude would imply a USD 12 difference. The recent lowering of the difference between Russian and global price is mainly due to falling global prices. Other explanations of the partial pass through include inadequate monitoring and enforcement to prevent sanction circumvention as well as the "refining loophole" that allows non-sanctioning countries to buy and process Russian oil and then sell to anyone without restrictions (CREA, 2023[23]). Additionally, use of the so-called shadow fleet of tankers for shipments of Russian oil and ship-to-ship transfers and mixing or illegally and legally shipped oil, including by disactivating the automatic identification system (AIS) that transmits ships' position and other fraudulent practices (Hilgenstock, Pavytska and Ivanchuk, 2024[24]).

[15] Average of prices between January 2018 – December 2019.

[16] See https://carnegieendowment.org/politika/91649, accessed 26 April 2024.

[17] See https://www.bloomberg.com/news/articles/2024-04-11/russia-attacks-ukraine-gas-storage-sites-driving-prices-higher, accessed 26 April 2024.

[18] See https://www.euractiv.com/section/agriculture-food/news/ukraines-grain-exports-via-black-sea-route-back-to-2023-levels/, accessed 29 April 2024.

[19] See https://www.washingtonpost.com/weather/2023/12/07/elnino-sugar-extreme-weather/, accessed 29 April 2024.

[20] Traditionally sugar production in Brazil's main producing region ends in November when the rainy season intensifies making it difficult to harvest sugar cane (USDA Foreign Agriculture Service, 2023[12]).

[21] Earlier this year, Kazakhstan, the world's largest miner of uranium, announced it may cut its 2024 production plan due to problems of availability of sulfuric acid needed to produce uranium.

[22] See https://www.reuters.com/markets/commodities/supply-risks-fuel-uraniums-flight-more-than-16-year-peak-2024-01-22/, accessed 29 April 2024.

[23] The supply of sulfuric acid, a bi-product of oil and gas production, will be impacted by the green transition. Moreover, additional demand for the input comes from alternative uses such as in phosphate fertiliser production.

[24] See https://www.reuters.com/business/autos-transportation/industry-pain-abounds-electric-car-demand-hits-slowdown-2024-01-30/, accessed 29 April 2024.

[25] See https://asia.nikkei.com/Business/Markets/Commodities/Nickel-and-lithium-prices-plunge-as-Chinese-EV-demand-loses-steam, accessed 29 April 2024.

3 Maritime transportation disruptions and international trade

In November of 2023, Houthi rebels began attacking commercial ships in the Red Sea and the Gulf of Aden forcing major shipping and logistic companies to temporarily reroute vessels around the southern tip of Africa in order to avoid the Suez Canal. This recent disruption in shipping lanes compounds continued Russia's invasion of Ukraine-related risks in the Black Sea, an important trade and transportation route connecting Europe and Asia. In addition, a drought in Panama, which started in early 2023, has forced the Panama Canal authorities to drastically reduce the number and size of ships passing through the canal. Moreover, there have also been several strikes at major ports, disrupting operations in the United States, Canada, and France.[1]

These recent transportation disruptions further highlight the importance of understanding the relationships between trade and transportation including routes, chokepoints, and shipping costs. The objective of this section is to provide descriptive statistics on the modes of transportation of traded goods, the main routes of maritime trade, and potential chokepoints. This is accompanied by a discussion of recent transportation disruptions and their impact on shipping costs.

3.1. Modes of transportation of merchandise trade

Few countries provide data on how goods are transported when they enter or leave a territory. For the purposes of this analysis, the OECD has compiled data for major economies that report bilateral trade values by modes of transportation[2]: Australia, Brazil, Canada, Japan, European Union,[3] Türkiye, and the United States (See Annex A for a description of sources and methodology). While the database covers only a fraction of total trade (29.5% of world export value and 33.4% of import value in 2023), some important insights can be gleaned from the data at the region and product level.

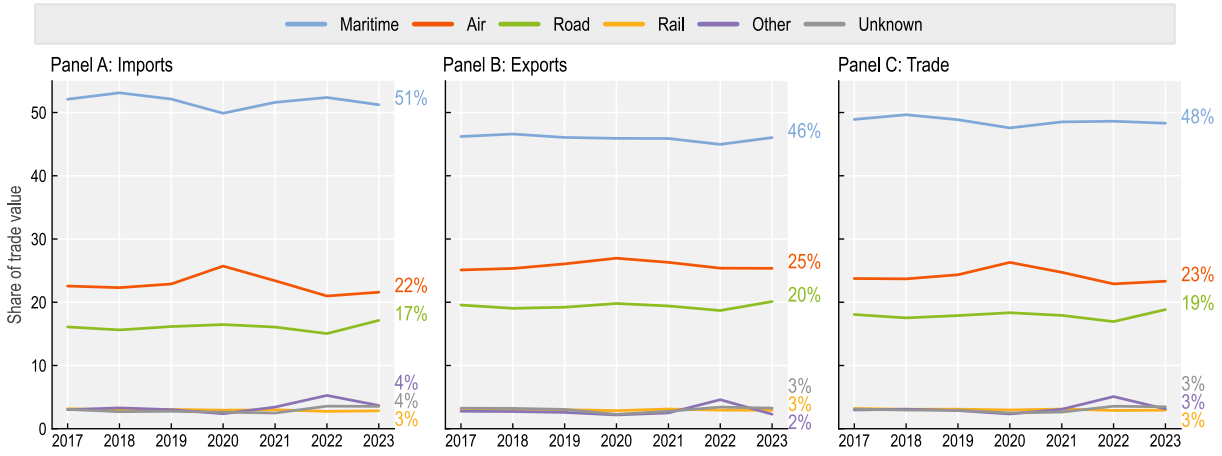
There are four major ways (modes) of moving goods over long distances: road, rail, air, and maritime.[4] Deciding which mode to use depends on several factors related to each mode, such as cost, capacity, speed, and reliability, as well as the type of goods being shipped. Maritime or rail might be preferred for heavy or bulky items such as cars, machinery, or grains, while air transportation is better suited for high-value or time-sensitive items.

Among the main modes of transportation, maritime transport offers the largest carrying capacity in both volume and weight and, when compared to some other modes, is more affordable and practical when shipping on long distances.[5] It is therefore by far the most used mode, accounting for almost half of internationally traded goods in 2023 (48.3%, Figure 3.1, Panel C), followed by air (23.3%) and road (18.8%). Rail and other modes of transportation such as post, pipelines, self-propulsion or fixed mechanism, accounted for 2.9% (Rail) and 3.1% (Other) of the value of goods being moved. Despite

significant disruptions to different transport modes during the COVID-19 pandemic, in 2023 the structure of trade by mode of transportation was similar to that in 2019.

The shares vary across countries, as the mode of transportation is determined by the geographical location and transportation infrastructure of a country, its trading partners and goods shipped. With at least one third of goods being shipped by water, maritime transport is the main mode for all the covered economies, except Canada (Figure 3.2). In Canada, goods enter the country mostly by road (52% of imports and 40% of exports were being shipped by trucks in 2023), revealing the importance of the country's land border with the main trading partner, the United States. Canada is also the only covered country where rail transportation accounts for a relatively large share among the different modes recorded when goods cross its borders (9% of imports and 13% of exports). Most countries with a significant land border use different modes of transportation as illustrated by the fact that at least 10% of goods enter or leave a country by sea, air and road. Brazil stands out with a lower value share of road and air transport for exports (respectively 6% and 4%), as its top exported commodities – grains and oilseed, oil, and mining products – are mainly transported by sea to China.

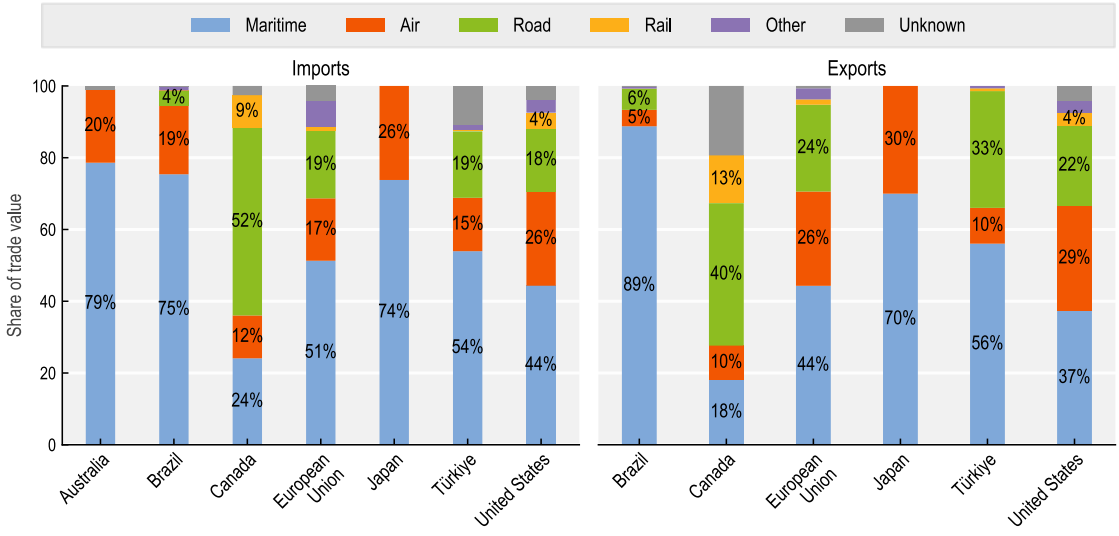
Figure 3.1. Share of merchandise trade by mode of transportation over time



Note: Based on trade values. Imports panel covers total imports for Australia, Brazil, Canada, Japan, European Union (extra-EU 27 trade, excluding trade with the United Kingdom, Türkiye, and United States. Exports panel excludes Australia which only provides mode of transportation for imports.

Source: OECD calculations based on UN Comtrade, Eurostat, E-Stat, US Department of Transportation (North America Transborder Freight Data), US Department of Commerce - US Census Bureau (See Annex A for more information on the compilation of trade data by mode of transportation).

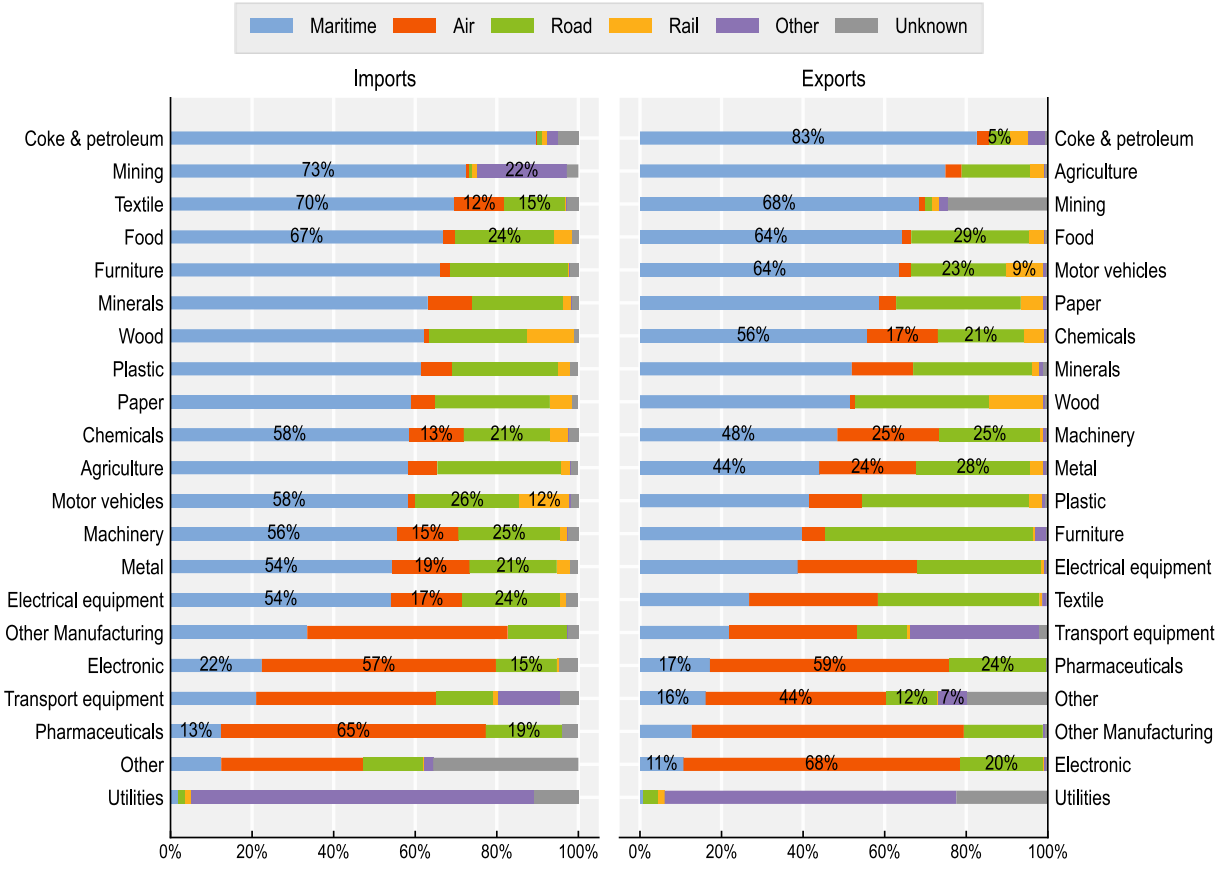
Figure 3.2. Modes of transportation for merchandise trade vary across areas in 2023



Note: Based on trade values. Imports panel covers total imports for Australia, Brazil, Canada, Japan, European Union (extra-EU 27 trade, excluding trade with the United Kingdom), Türkiye, and the United States. Exports panel covers the same areas except Australia. Australia which only provides mode of transportation for imports.
Source: OECD calculations based on UN Comtrade, Eurostat, E-Stat, US Department of Transportation (North America Transborder Freight Data), US Department of Commerce - US Census Bureau

For bulk items such as mining and agriculture products, maritime shipping is the predominant mode of transportation (Figure 3.3). Textile products and chemicals are also mainly imported by water (70% and 58% respectively) as well as motor vehicles, which has specific ships ("ro-ro" or "roll on/roll off") to transport them. On the other hand, high-value or time-sensitive items like electronics or pharmaceuticals have larger shares of goods shipped via air (respectively 57% and 65%, for imports). If road transport accounts for an important share of imports and exports for most of the goods, it is rarely the most preferred mode. For the selected economies covered in this analysis, exports show more varied modes of transportation as air and road transportations accounts for larger shares for many products compared to imports.[6] For products and countries that mostly rely on modes of transportation other than maritime, recent disruptions in maritime trade may be less concerning. There may be more relevant transportation disruptions for these products or countries, such as those experienced during the COVID-19 pandemic when air travel was largely shut down. These alternative transportation disruptions are not the focus of this section.

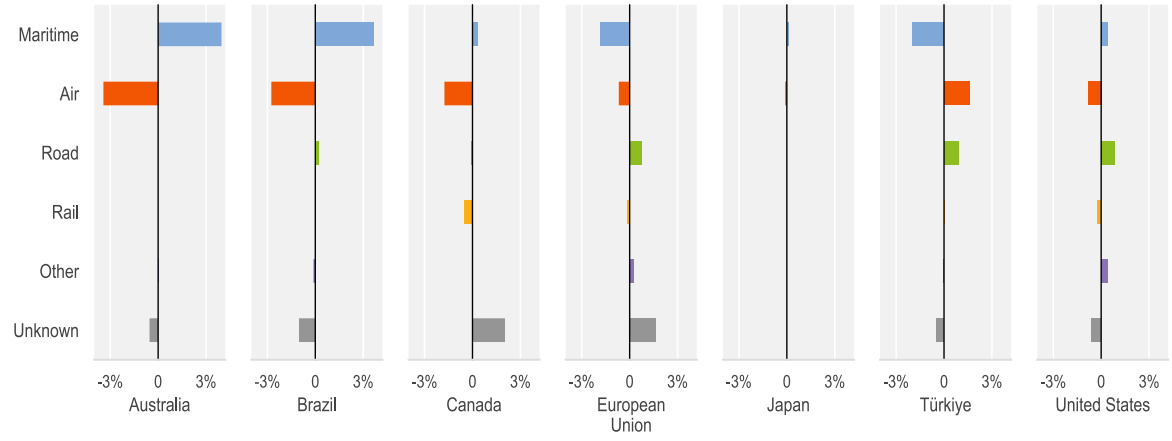
Figure 3.3. Shares of modes of transportation by industries, 2023



Note: Imports include data for Australia, Brazil, Canada, Japan, European Union (extra-EU 27 trade, excluding trade with the United Kingdom), Türkiye, and United States. Exports covers the same areas except for Australia which only provides mode of transportation for imports. Shares of the main modes of transportation are displayed for top 10 traded products. Other modes of transportation include self-propulsion, post, and fixed mechanism. The product classification is BDTIxE industries converted from HS Nomenclature at the 6-digit level. Utilities include waste, recycled rubber, gas, and electricity. Other products cover optical media (e.g. digital storage devices), printed materials, and works of art. Maritime transport includes sea and inland waterways.
Source: OECD calculations based on UN Comtrade, Eurostat, E-Stat, US Department of Transportation (North America Transborder Freight Data), US Department of Commerce - US Census Bureau

The structure of trade by mode of transport has not changed dramatically in the last four years although some changes can be observed (Figure 3.4). Since the beginning of the COVID-19 pandemic, the shares of maritime and air transport among the covered economies decreased while road transport increased. Despite a rebound in maritime transport in 2021, the share of goods transported by water was slightly below pandemic levels in 2023 (Figure 3.1). The air cargo industry was also highly impacted as international passenger aircraft belly capacity was drastically reduced in the first half of 2020. In 2023, the air cargo capacities reached 2019 levels but the demand for cargo was still 3.6% below pre-pandemic levels (IATA, 2023[13]).[7] Road transportation has become more important in all the covered economies with land borders except Canada. In the United States, trade with Canada and Mexico increased by almost a third between 2019 and 2023, boosting road transportation. In the European Union, the share of road transportation increased as a result of a more limited decline compared to other modes in the context of overall declining trade (Eurostat, 2023[14]) and higher value-to-weight ratios for products such as chemicals which are transported relatively intensely across EU borders.

Figure 3.4. Structure change in modes of transportation for trade between 2019 and 2023



Note: The structure change represents the difference in percentage points between 2023 and 2019 transportation value shares. It covers total trade (exports plus imports) for Brazil, Canada, Japan, European Union (extra-EU 27 trade, excluding trade with the United Kingdom), Türkiye, and United States. For Australia, only imports are included.
Source: OECD calculations based on UN Comtrade, Eurostat, E-Stat, US Department of Transportation (North America Transborder Freight Data), US Department of Commerce - US Census Bureau.

3.2. Potential maritime trade chokepoints

With around half of major economies' trade depending on maritime shipping, the recent disruptions of transport routes and growing geopolitical tensions have heighted interest in understanding maritime transport pathways and potential chokepoints. While there is no commonly accepted definition, chokepoints can be defined as strategically important, naturally narrow, high-traffic shipping pathways on the world's most important maritime shipping routes that have few alternative routes. This section builds on two data sources to provide more information on shipping routes and chokepoints: UN Trade and Development (UNCTAD) and IMF Portwatch. UNCTAD provides estimates of annual total volume of merchandise shipped by sea (UNCTAD, 2023[15]). The IMF Portwatch platform estimates the daily volume of trade going through 1 388 ports and 24 chokepoints using AIS (Automatic Identification System) data transmitted from vessels and collected by the UN Global Platform (Arslanalp, Koepke and Verschuur, 2021[16]).[8] In addition, traffic statistics from the Suez Canal[9] and Panama Canal[10] authorities are also used for annual volume of trade by product on these routes.

There are five primary shipping routes for global trade connecting the different regions of the world. The Dover Strait, or the English Channel, connects the North Sea and the Atlantic Ocean and is a vital trade link between Europe and the United Kingdom. It is also a primary maritime route between the Atlantic and the port of Rotterdam, Europe's busiest port. The Strait of Malacca near Indonesia is not only the main shipping lane out of Asia, but also connects Asia's biggest economies. The Panama Canal is a key pathway between Asia and the East Coast of the United States significantly reducing travel time, between 5 to 17 days (or 15 to 37%), compared to routes around the Cape Horn or through the Suez Canal.[11] The Suez Canal is the shortest sea route between Asia and Europe and, on the route from Shanghai to Rotterdam, for example, cuts transit time by some nine days (or 24%) when compared with transport around the Cape of Good Hope or eight days (22%)[12] when compared with transport through Panama Canal.[13] The Danish Straits linking the North Sea and the Baltic Sea is an important route for trade between Russia and Europe.[14]

There are a few strategic locations along these major maritime shipping routes where large shares of maritime trade transit through (Figure 3.5). Notably, a large share of international maritime trade goes

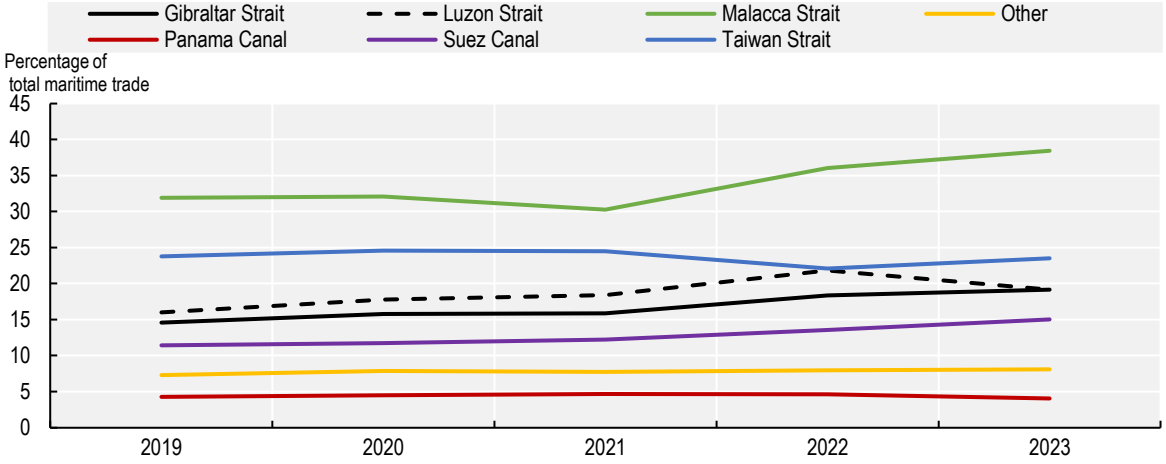
through several Asian chokepoints, highlighting the global importance of China in global trade. In 2023, 38% of global maritime trade passed through the Malacca Strait, and the Taiwan and Luzon Straits accounting for 25% and 19%, respectively. Another important shipping route is the one that links Asia to Middle East and Europe with 15% of 2023 global maritime trade transiting through the Red Sea and passing through the Bab-el-Mandeb Strait and the Suez Canal. Another potential choke point is the Strait of Hormuz in the Middle East. It is considered the world's most important oil transit choke point with little options to bypass the strait. Only Saudi Arabia and United Arab Emirates have pipelines that can ship crude oil out of the Persian Gulf. [15] Finally, 19% of global maritime trade passes through the Gibraltar Strait which is another important location on maritime transport routes linking the Americas and Europe.

Figure 3.5. Most of maritime trade goes through a few chokepoints

Note: This map represents the list of chokepoints identified by the IMF for which the share of 2023 total maritime trade is higher than 5% as well as the Panama Canal. Shares were calculated as the ratio of the volume of trade going through each chokepoint to the 2023 total volume of maritime trade. The volume of trade going through each chokepoint is estimated by the IMF using AIS data transmitted from vessels and collected by the UN Global Platform. 2023 total volume of maritime trade was estimated using 2021 total maritime trade from UNCTAD database and yearly growth rates provided in UNCTAD maritime trade reports.
Source: Author's elaboration based on IMF Portwatch (data extracted on 10 September 2024) and UNCTAD.

The relative importance of these locations appears to have been largely unaffected in the first two years of the COVID-19 pandemic, but 2022 and 2023 feature more significant changes. Overall, the Malacca and Taiwan straits are the two locations that experienced some the largest changes in their relative importance in global maritime transport. Since the beginning of the COVID-19 pandemic, the Malacca Strait has appeared to have attracted relatively traffic while Taiwan Strait has seen a decrease in traffic. The shares of traffic passing through the Gibraltar Strait and Suez Canal have increased while the share of Panama Canal has contracted (Figure 3.6). This can be explained by increased shares of maritime trade going to or coming from Asia (Malacca Strait), going through the Asia – Europe route (Bab-el-Mandeb Strait, Suez Canal) and the America – Europe route (Gibraltar Strait). In addition, the geopolitical tensions between China and Chinese Taipei in 2022 seem to have shifted maritime trade from the Taiwan Strait to the nearby Luzon Strait

Figure 3.6. The increase in traffic after the pandemic went mainly through a few chokepoints, notably the Malacca Strait



Note: Shares are calculated as the ratio of the volume of trade going through each chokepoint on the 2023 total volume of maritime trade. The volume of trade going through each chokepoint is estimated by the IMF using AIS data transmitted from vessels and collected by the UN Global Platform. 2022 and 2023 total maritime trade were estimated using 2021 total maritime trade from UNCTAD database and yearly growth rates provided in UNCTAD maritime trade reports. The "Other" category represents the average of the 18 other chokepoints identified by the IMF.
Source: Author's elaboration based on IMF Portwatch (data extracted on 10 September 2024) and UNCTAD.

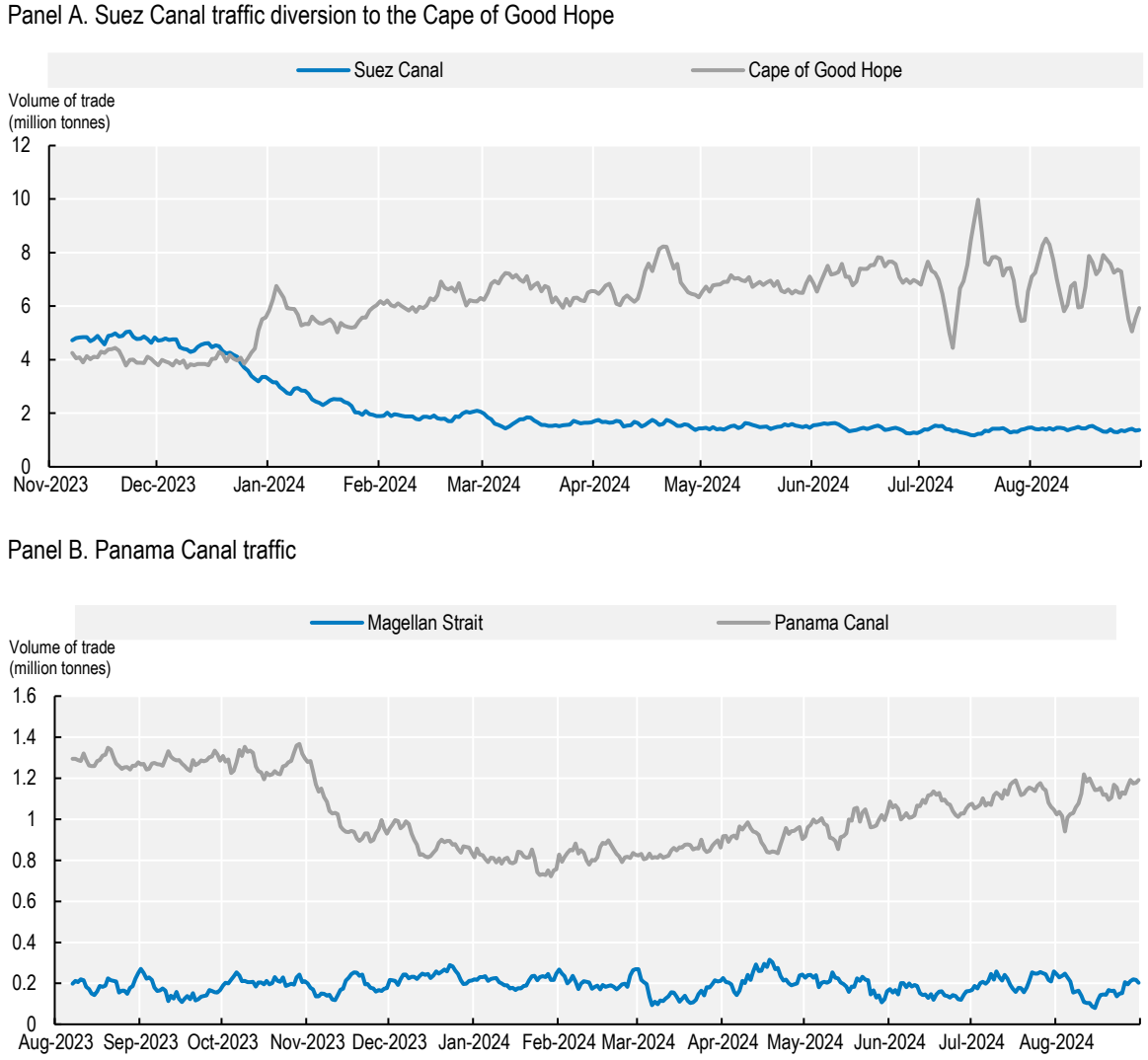
3.3. Recent disruptions in maritime shipping

Disruptions in two major maritime chokepoints have resulted in some re-routing of seaborne trade routes. The Red Sea Crisis has reduced traffic significantly since the start of the Houthis attacks on commercial ships which started at the end of 2023. Major shipping companies have re-routed vessels around the southern tip of Africa to avoid the Suez Canal altogether. Since the start of the attacks, the volume of trade passing through the Suez Canal has been declining while at the same time trade transiting via the Cape of Good Hope has been increasing (Figure 3.7, Panel A). By the end of the first quarter of 2024 about four times more trade was transiting around Africa than passing through the Suez Canal however overall, the total traffic on both these routes remained unaffected. The rapid adaptation of shipping companies to this alternative route avoided large disruptions in Mediterranean ports, in which the daily average volume of trade has not changed significantly compared with other ports worldwide (Figure A B.1 and Figure A B.2). However, extreme weather conditions around the Cape of Good Hope starting in the third quarter of 2024 added further disruptions and transit delays causing wide swings in the average number of daily transits. Analysts believe the recent weather disruptions on this route will unlikely have significant supply chain impact, however carriers will have even more added pressure to adapt and stabilise their network already under pressure from the situation in the Middle East.[16]

Another worrisome chokepoint has been the Panama Canal which has been suffering from low water levels due to a prolonged drought since early 2023. This forced canal authorities to significantly reduce the number of ships allowed to transit daily as of November 2023.[17] Alternative shipping routes by-passing the Panama Canal include sailing around Africa, transiting through the Suez, which is for now a less viable option, or sailing through the Strait of Magellan or Cape Horn. Since the November 2023 announcement, daily trade volumes passing through the Panama Canal have dropped sharply (Figure 3.7, Panel B). The total volume of trade in the last quarter of 2023 and first quarter of 2024 dropped by 25% compared to the same period the year before. While historically relatively less trade passes through the Strait of Magellan than through the Panama Canal, there are some signs of rerouting of trade with 30% more trade volume passing through the Strait of Magellan in the last quarter of 2023 than the year before. However, the daily

trade volume passing jointly through both these routes remained significantly lower implying that trading firms might have relied on alternative transportation. One major long-existing option is to unload containers from ships calling at western North American ports — Los Angeles/Long Beach, Seattle, and Vancouver — onto rail cars, a relatively economical, multimodal option. Other future alternatives are discussed in Section 3.3.1 Multimodal alternatives.

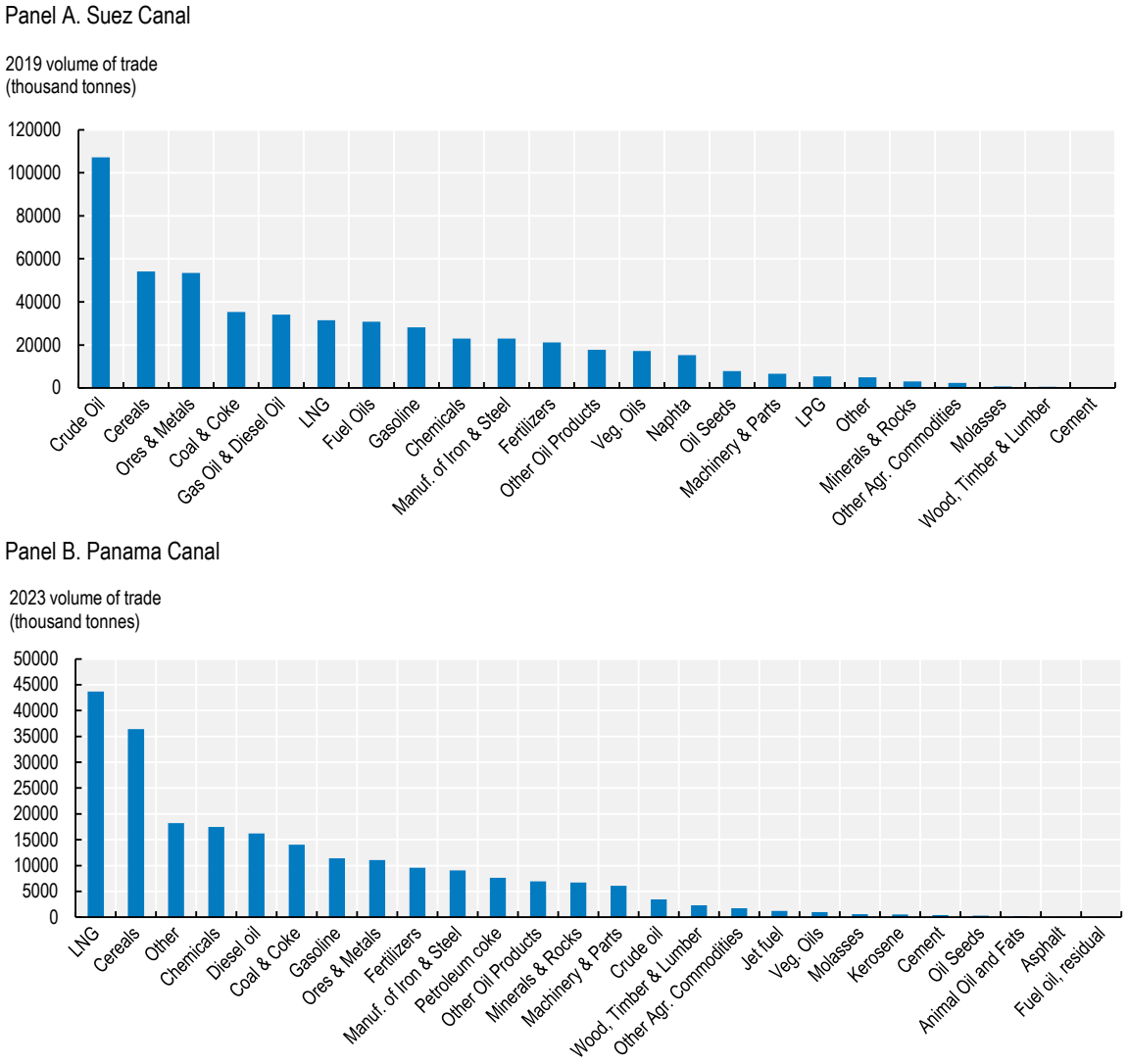
Figure 3.7. The Suez Canal disruption is diverting more ships than the Panama Canal drought



Note: Seven-day moving averages, using daily data up to 31 August 2024. The volume of trade going through each chokepoint is estimated by the IMF using AIS data transmitted from vessels and collected by the UN Global Platform
Source: IMF Portwatch (data extracted on 10 September 2024).

As highlighted previously, fossil fuels (coal, coke and petroleum products) and agricultural products are mostly traded through maritime transportation and they also account for most of the non-containerized traffic in the Suez Canal and the Panama Canal (Figure 3.8). This correlation between the industries' shares of traffic at the chokepoints and their reliance on maritime trade (Section 3.1) emphasises the importance of these strategic locations in maritime trade pathways and implies that trade in energy and agricultural products is potentially more exposed to such chokepoint disruptions.

Figure 3.8. Oil products and cereals represented most of bulk traffic in the Suez Canal and the Panama Canal



Note: The data is available for the Suez Canal only up to 2019. Some product categories provided by the Suez Canal authorities and the Panama Canal authorities have been renamed and regrouped to get a comparable list. Container cargo (accounting for 49.2% and 22.0% of total trade in the Suez Canal and the Panama Canal, respectively) have been excluded because of missing information on the products shipped.
Source: Author's elaboration based on Suez Canal statistics 2019 annual report (Panel A) and Panama Canal statistics 2023 annual report (Panel B).

3.3.1. Multimodal alternatives

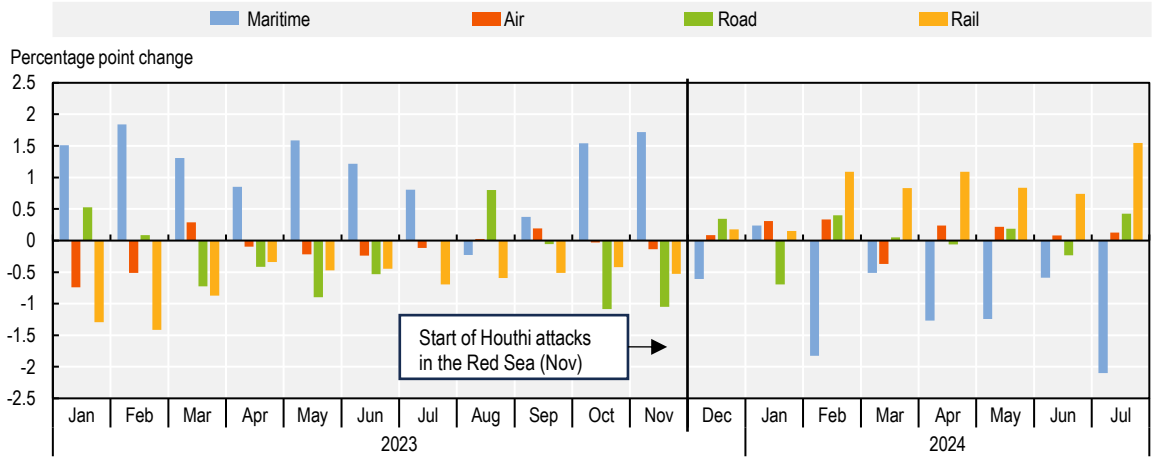
While maritime trade is the main mode of transportation for many products (Section 3.1), in some cases finding alternative modes of transportation is a viable way of responding to transportation disruptions. An alternative to transiting through the Panama Canal is to send cargo on ships to US West Coast ports and then transport the cargo by rail across the United States. Similarly, while the Suez Canal is the main shipping route between China and Europe, air, rail and road freight have long been used as alternative means of transporting goods between the two regions.

In the case of the Suez Canal, the latest Eurostat monthly trade volumes data by mode of transport indicate that there may be signs of traders switching from sea freight to other modes of transportation particularly for imports into the European Union. While monthly import volumes across all modes of transportation were down starting from July of 2023 relative to the same months in 2022 (not shown), the share of maritime trade in 2023 has been increasing relative to previous years (Figure 3.9). However, since the start of the Red Sea Crisis in November 2023, this trend appears to have been reversed as illustrated by the shifts in the shares in December 2023 and January and February 2024. In July 2024, for example, the share of maritime shipping declined almost two percentage points while the share of other modes increased. Rail experienced the strongest increase among the alternative modes.

The recent maritime transport disruptions have also led to new initiatives focusing on upgrading of existing and development of new alternatives. As mentioned in the previous subsection, in the context of the Panama Canal disruptions, the Chilean President recently launched a USD 400 million investment to improve port infrastructure at the Strait of Magellan.[18] Governments and private investors have also explored other alternatives such as a canal across Nicaragua, a rail transport system across Colombia, a similar rail system across Mexico, a tunnel across Colombia and a South American land bridge.[19] The recently announced India-Middle East-Europe Economic Corridor (IMEC), an ambitious multi-modal transportation corridor initiative that will link Europe and Asia could be an alternative to the Suez Canal.[20] If pursued, these projects will take time to come on board.

Figure 3.9. Some small signs of shifts away from maritime transport due to Red Sea Crisis

Percentage point change of volume shares from previous years



Note: Based on volumes (tonnes) of imports from China to the European Union. Shares by mode of transport do not include the "other" category which accounted for 1% or less of monthly trade volumes.
Source: OECD calculations based on Eurostat data. Extracted October 2024.

3.3.2. Impact on shipping costs

As far as the Red Sea situation is concerned, for the moment, about half of the concerned trade (OECD, 2024[3]) has been re-routed to avoid the Suez Canal facing longer transit times, shipping delays and increased costs. ITF (2024[17]) estimates that re-routing around the Cape of Good Hope adds around 8 500 nautical miles to a round trip voyage between the Far East and Europe and adds ten days of transit each way. This source estimates also that since the start of the attacks, the global average of container ship delays has deteriorated from 5.1 days in November 2023 to six days in January 2024 but improved again in February reflecting adjustment of shipping schedules to new routes (Sea-Intelligence, 2024[18]).

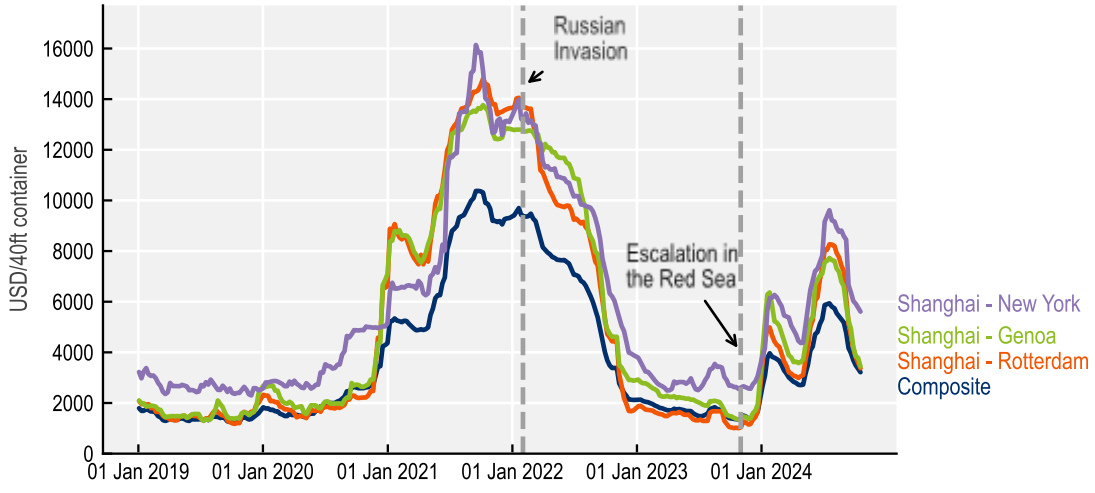
Moreover, the lengthening of the sea route adds additional costs to shipping companies. Additional days at sea requires more fuel and more charter costs, which include things like wages, operations costs, insurance, management and administration costs. The longer trip also requires additional days of container hire. In total, ITF (2024[17]) estimates the additional costs of a medium-sized container ship travelling from Asia-Europe transiting around the Horn of Africa to be USD 1.7 million for a round trip which represents an additional USD 272 (or approximately 19%) per 40-ft equivalent unit (FEU – 1 container) container into Europe.[21]

However, the recent increases in shipping costs appear larger than what is implied by the additional cost estimation. Since the escalation of the situation in the Red Sea, shipping rates for containers have been climbing, particularly for routes between Asia and Europe (Figure 3.10). At the peak just after the initial attacks, shipping rates between Asia and Europe increased over 300% to about USD 5 000 per FEU between Shanghai and Rotterdam and over USD 6 000 between Shanghai and Genoa. At the end of February, one month later, rates subsided falling to just 150% above the rates before the Houthi attacks. Due to interconnectedness between different maritime trade routes, the shipping costs on routes to and from the US East Coast — which are already experiencing an additional upward pressure from the reduced capacity in the Panama Canal — were also impacted by the Suez Canal disruptions. Rates on the Asia — New York route increased by 126% to USD 5 820 per FEU.

In the second quarter of 2024, container rates peaked once again. Bad weather in key chokepoints in East Asia, including fog in Shanghai and torrential rain in Malaysia and Singapore, have resulted in increased port congestion and shipping delays.[22] This comes at a time when shipping container demand is on the rise as retailers begin to stock up inventory for the back-to-school and holiday seasons coupled with container availability problems related to the Red Sea crisis. As a result, the composite index more than doubled between April and July 2024 before falling again and ending up around 20% higher than after the initial peak after the Houthi attacks. However, overall, while current container freight rates are relatively elevated, the level is far below what was observed during the COVID-19 pandemic-related supply chain disruptions.

Figure 3.10. Shipping rates for containers have been climbing since the escalation in the Red Sea

Weekly world container index

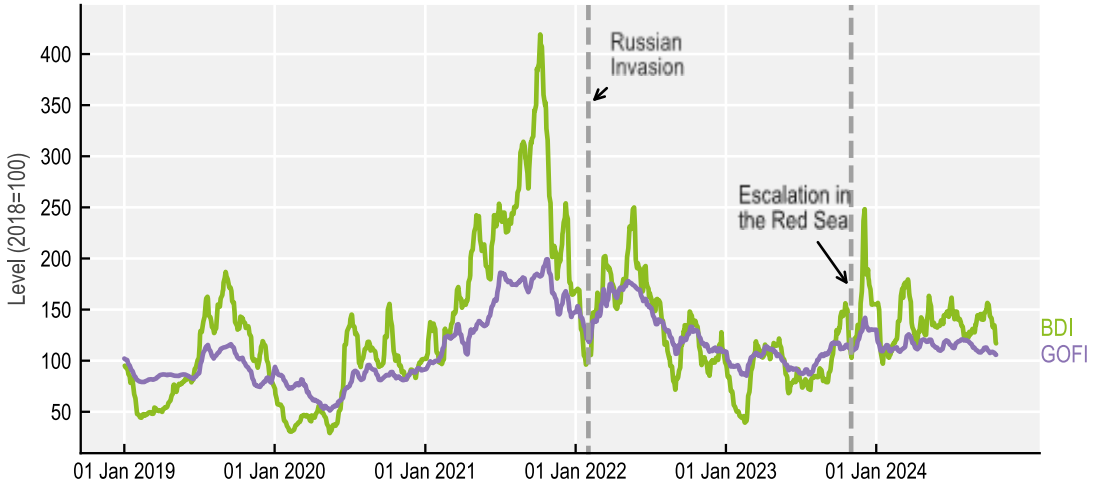


Note: Composite is weighted average of the eight available routes weighted by trade volume. See Drewry methodology for more information.
Source: Drewry, via Infogram and MacroMicro (accessed 21 October 2024, last data point 17 October 2024).

Only 6% of dry bulk trade passes through the Suez Canal, but bulk ships have been re-routing there due to reduced transit slots through the Panama Canal.[23] The Baltic Dry Index (BDI) more than doubled in November after the Panama Canal Authorities reduced the number of daily transits and spiked again shortly after Houthi rebels attacks, reaching levels seen after Russia's invasion of Ukraine. Grains and Oilseed Freight Index (GOFI) also responded to the Red Sea escalation, but not to the same extent as BDI. As of mid-October, the GOFI is down 4% since just before the Houthi attacks, while the BDI is up by 20% (Figure 3.11).

Figure 3.11. Shipping rates for commodities not immune to transport disruptions

Evolution of the Baltic Dry Index (BDI) and the IGC Grains and Oilseeds Freight Index (GOFI)



Source: Baltic Dry Index sourced from Investing.com (accessed 21 October 2024, last data point 18 October 2024), GOFI index and sub-indices sourced from IGC, OECD calculations.

In 2021, the OECD estimated that the sharp rise in commodity prices, along with higher shipping costs, accounted for much of the observed increase in import price inflation and consumer price inflation in 2021 (OECD, 2021[19]). The impact of rising shipping costs alone on import prices and headline inflation will be much lower, as transport costs are a smaller part of the cost of total imports. While there has been some reaction in shipping rates, for the moment, commodity prices showed only small if any reactions to the escalation in the Red Sea. However, since adjustments are still taking place, a long-term impact of the Red Sea crisis and the Panama Canal drought on prices and on global trade may still not be fully visible.

Overall, while adjustments have been taking place, showing a certain resilience of global trade to maritime transport disruptions, the analysis presented in this Section also shows a range of effects which, depending on their duration and potential intensification or decline, may have more significant implications for global trade, prices and economic growth. OECD (2024[3]) points out, for example, that the impact of an intensification of the evolving conflicts in the Middle East and resultant energy price spikes could be magnified if disruptions extended to the Strait of Hormuz which would significantly disrupt the already very tight supply balance of the global tanker market. This further illustrates why the situations in the Red Sea, the Panama Canal and other major maritime transport chokepoints remain a downside risk to the current trade outlook.

Notes

[1] See https://www.ics-shipping.org/news-item/summer-of-strikes-in-us-and-canadian-ports-offer-lessons-for-shipping/ and https://www.hellenicshippingnews.com/hapag-lloyd-the-ports-of-le-havre-and-fos-sur-mer-have-a-72-hour-closure-with-schedule-impacts-on-the-services-calling-these-ports/, accessed 1 May 2024.

[2] In this sub-section, the mode of transportation refers to the way goods enter or leave a territory.

[3] Eurostat data only records mode of transportation for extra-EU trade.

[4] "Self-propelled" is a category found in the trade data. These items include ships, aircrafts, and other vehicles.

[5] See https://www.maersk.com/logistics-explained/transportation-and-freight/2024/02/01/logistics-transport-modes-explained;

[6] Having said this, Canada relies heavily on road transportation specifically for plastic (78% of trade), furniture (76%) and machinery (72%).

[7] However, at the end of 2023 and during the first quarter of 2024, demand for air cargo saw a strong increase, possibly related to the Red Sea crisis (IATA, 2023[13]).

[8] IMF Portwatch estimates maritime trade using AIS data transmitted from vessels. These estimates, as well as shares of maritime trade going each chokepoint which use these figures can be differ from national trade and traffic data. However, IMF Portwatch provides extensive global coverage using a consistent methodology thereby ensuring comparable figures across ports and chokepoints.

[9] The Suez Canal statistics are available at https://www.suezcanal.gov.eg/English/Downloads/Pages/default.aspx?folder=Navigation%20Reports/Annual%20Reports%E2%80%8B%E2%80%8B%E2%80%8B.

The Panama Canal statistics are available at https://pancanal.com/wp-content/uploads/2023/11/06-Principal-Commodities-Shipped-Through-the-Panama-Canal.pdf.

[10] For the Panama Canal statistics, the 2023 annual report is available at https://pancanal.com/wp-content/uploads/2023/11/06-Principal-Commodities-Shipped-Through-the-Panama-Canal.pdf.

[11] This direct route between the Atlantic and Pacific Oceans saves around 2 000 to 8 000 nautical miles. The route from Shanghai to New York passing through the Panama Canal cuts the transit time by 17 days (or 37%) compared to transport via the Strait of Magellan or Cape Horn or five days (15%) compared to transport via the Suez Canal. Specifically, travel time is cut from around 46 days via the Strait of Magellan or Cap Horn to around 29 days via the Panama Canal at 15 knots vessel speed.

[12] Travel time is cut from around 38 days via the Cape of Good Hope and around 37 days via the Panama Canal, to around 29 days via the Suez Canal.

[13] Note that apart from the transit time differences, these routes are also characterised by different weather conditions which can alter transit times under specific circumstances. For example, routes via the Strait of

Magellan and Caper Horn, which may seem viable alternatives to some routes passing via Panama Canal, are known for much worse weather conditions.

[1414] Based on information from https://www.container-xchange.com/blog/shipping-routes/ and https://sea-distances.org (accessed 2 May 2024) and Rodrigue (2024[22]).

[15] See https://www.eia.gov/todayinenergy/detail.php?id=39932, accessed 14 June 2024.

[16] See https://www.lloydslist.com/LL1149870/Bad-weather-hits-alternative-routing-around-Cape-of-Good-Hope, accessed 11 September 2024.

[17] See https://www.reuters.com/business/panama-canal-says-will-slash-booking-slots-due-drought-2023-10-31/, accessed 30 April 2024.

[18] See https://www.radiofrance.fr/franceinter/podcasts/les-histoires-du-monde/histoires-du-monde-du-jeudi-25-avril-2024-6545440.

[19] See https://www.bakerinstitute.org/research/supply-chain-alternatives-ocean-shipping-if-climate-change-driven-water-shortages-persist.

[20] Announced at the G20 summit in September 2023, https://www.internationalaffairs.org.au/australianoutlook/the-india-middle-east-europe-economic-corridor-promises-and-challenges/. Note, however, as of the end of 2023, only Saudi Arabia has committed to invest in this initiative.

[21] The 5% increase has been calculated with respect to an average rate of USD 1 460 charged per FEU travelling from Asia to Northern Europe (average for the Drewry Rotterdam-Shanghai index in 2023).

[22] See https://www.pegasusmaritime.com/news/market-q2-2024-update-2 accessed 8-July-2024.

[23] See https://www.lloydslist.com/LL1147659/Bulkers-diverting-from-Suez-may-need-a-Plan-C.

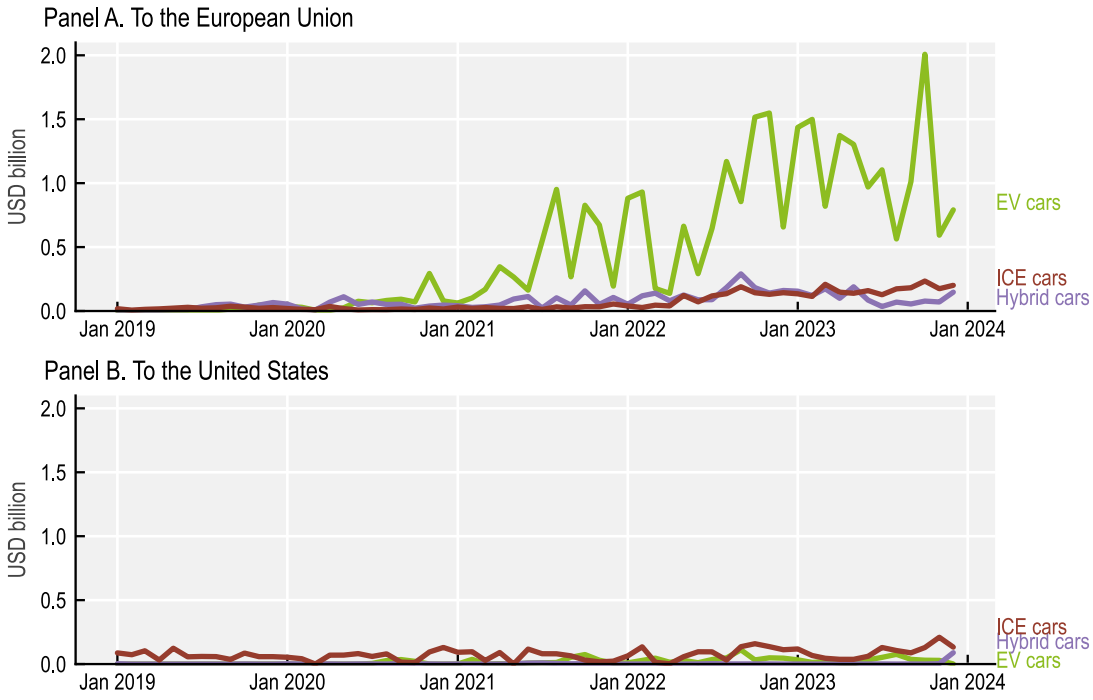
4 Recent trends in concentration of exports of electric vehicles and electric vehicle parts

Against the background of the debate about global trade in electric vehicles (EVs), including recent announcements of further tariff increases by the United States, European Union and Canada on EVs imported from China, analysis of global trade in electric vehicles and EV parts[1] reveals a significant increase in market concentration. Trade in EV batteries in particular has become increasingly concentrated, driven mainly by the emergence of China as a new and fast expanding producer.

Growth in imports of EVs from China has been uneven across regions and recent periods. EU imports of Chinese EVs skyrocketed in late 2022 and 2023, outpacing internal combustion engine (ICE) cars (Figure 4.1 Panel A). During the same period, imports of EVs from China into the United States increased only marginally and remained below ICE cars (Figure 4.1 Panel B). These developments likely reflect a host of factors, including China's growing role in extraction of critical raw materials that are used to produce batteries and in the development of the associated technologies but also changes in consumer tastes and policies in China and its trading partners.[2]

The remainder of this chapter takes a closer look at the evolution of concentrations of world trade in passenger cars and car parts while distinguishing between the types of cars (ICE, hybrids and EVs) as well as the parts and components used in production of each of these car categories. The analysis shows that for ICE the global market concentrations are low to moderate and have been declining as more countries have come to account for a larger share of exports. However, it also shows that global exports of EVs and EV-related parts, in particular batteries, have become more concentrated, accounted for mainly by the emergence of China as a new and fast expanding exporter.

Figure 4.1. Exports of passenger vehicles from China to the European Union and the United States



Note: ICE stands for internal combustion engine cars. EV stands for Electric Vehicles. Electric Vehicles (EV) includes HS code 870380 and Hybrid category includes HS codes 870340, 870350, 870360, 870370. The Internal combustion engine (ICE) car category includes HS codes 870321, 870322, 870323, 870324, 870331, 870332, 870333.
Source: UN Comtrade (accessed 5 September 2024, last data point December 2023).

4.1. Global export concentration

Since 2000, there have been large shifts on the list of the major players of the passenger car market.[3] Countries such as Germany, Japan, Canada, France, and Spain, once power houses for internal combustion engine (ICE) cars, have lost market share,[4] and emerging car producing countries in Eastern Europe (Czech Republic, Slovakia, and Hungary) and Asia (China) now account for a larger share of global supply (Figure A B.4 Panel A). This reconfiguration has led to a decline in market concentration (Figure 4.2). In 2000, the top 10 car exporters accounted for 88% of total world exports while by 2023 this ratio dropped to 72%.

The market for ICE car parts (e.g. gear boxes, mufflers, engines) and parts common to all cars (e.g. chassis, bumpers, seatbelts, etc.) has consistently shown to have low concentration across exporters (Figure 4.2). Since 2000, the main (top 5) ICE parts producers, apart from Germany, have lost market share (Figure A B.4 Panel D). Canada, United Kingdom, and Austria are no longer in the top 10, replaced by new entrants such as China, Korea, and Poland. Mexico increased its rank from seventh to fifth place. By 2023, the top 10 exporters accounted for only half of total exports, a 12-percentage point drop from 2000. Similarly, the market for parts common to all vehicles saw top producers like Canada, United Kingdom, Spain, and Belgium fall out of the top 10, replaced by China, Poland, Korea, and the Czech Republic (Figure A B.4 Panel F).

Electric vehicles (EV) and hybrid cars have grown in popularity over the years. Since 2017 (the first year the EV and hybrid categories are distinguished in trade data[5]), the share of electric cars in total car exports, in value terms, have increased from 1% to 15% and the share of hybrids grew from 5% to 19%

(Figure A B.5). Initially, international EV markets were highly concentrated, with the top 5 exporters accounting for 87% of EV cars and 75% of hybrid car exports in 2017. The United States, Germany, the Netherlands, Japan, and France were initially the top EV exporters (Figure A B.4 Panel B) while Japan, Germany, Korea, Belgium, and Türkiye led the field for hybrid car exports (Figure A B.4 Panel C). Over the last five years or so, the concentration of exports in both EV and hybrid markets has fallen to moderate levels, with the export concentration of hybrids falling more sharply and landing just short of the conventional low concentration threshold in 2023 (Figure 4.2). Germany, Slovakia, the United Kingdom, Spain, the Czech Republic, and China along with Hungary, Poland and Italy increased their share of hybrid car exports ranging from 1 (Italy) to 8 (Germany) percentage points between 2017 and 2023. The concentration of EV exports increased in 2022 and remains in the upper limit of a range which is normally considered as moderately concentrated (Figure 4.2), driven by a large shift away from the United States and the Netherlands, whose export market shares dropped from for 39% and 15% to 5% and less than 1% respectively and whose shares were replaced by exports from China (whose market share increased from 1% to 24%) and Germany.[6]

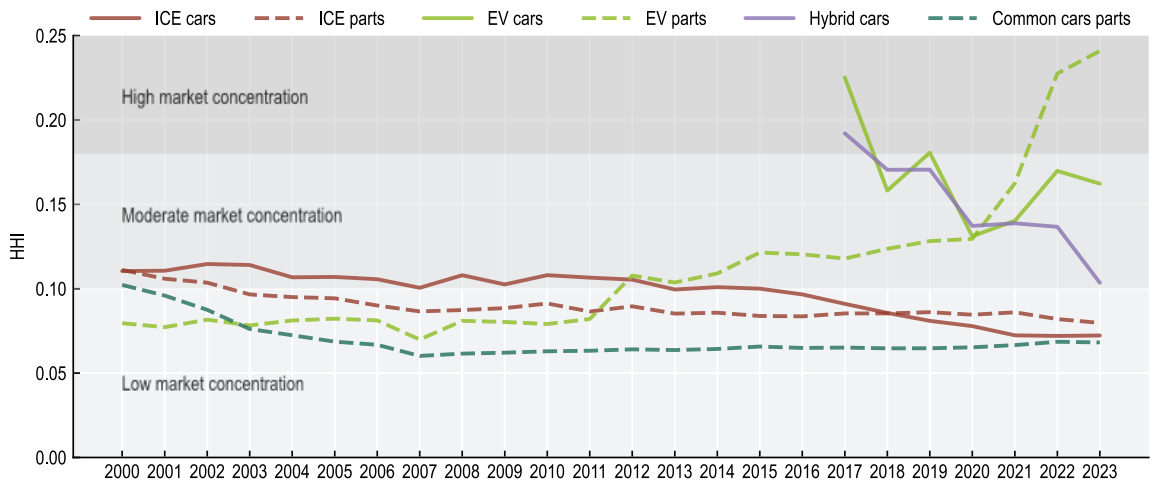
The concentration of exports of EV car parts as a whole, which cover battery packs and modules[7], other EV battery parts, and electric motors, has increased sharply since 2011 (Figure 4.2), driven by China's growth in the exports of EV components, in particular battery packs and modules. By 2023 China accounted for almost half (46%) of the exports of EV parts which is more than nine times larger than the other two top-3 exporters (Poland (8%) and Hungary (7%).

Moreover, the market concentrations of the various EV parts are markedly different when the concentration of each part is considered separately (Figure 4.3). For example, the global supply of other battery parts, i.e. electric accumulator parts, have been moderate over the time frame. While the concentrations of the different types of electric motors, have fluctuated between the low to moderate range over the years and have converged to a low level of market concentration by 2023. On the other hand, the export market of EV battery packs and modules (HS850760 and henceforth referred to as EV batteries), which accounts for the largest share of the EV parts category (82% in 2023), has been highly concentrated over the years and the increase in concentration, particularly over the last three years, has been largely driven by China's dominance in this industry (Figure 4.4).

A decade ago, Japan, Korea, and China dominated the EV battery industry (Figure 4.4). In total they accounted for 77.8 % of total EV battery exports with China accounting for only 39.4% of total exports and Japan and Korea accounting for roughly 20% each. Over the years new exporters entered the market. Most notably, battery producers in Poland and Hungary have slowly been increasing their market shares over the years. So much so that by 2023, they replace Japan and Korea as the number two and three exporters (respectively). However, despite new entrants, the market concentration of EV batteries climbed steeply starting from 2021 as China increased its market share from 42% in 2021 to 52.5% in 2023 while Poland and Hungary never accounted for more than 18% in total over those years, meaning that China's share of EV battery exports has been over three times that of the number two exporter over the last few years. Not surprisingly, China has accounted for almost all of the recent increase in concentration of EV battery exports (92% in 2023).

Figure 4.2. Changes in concentration over time

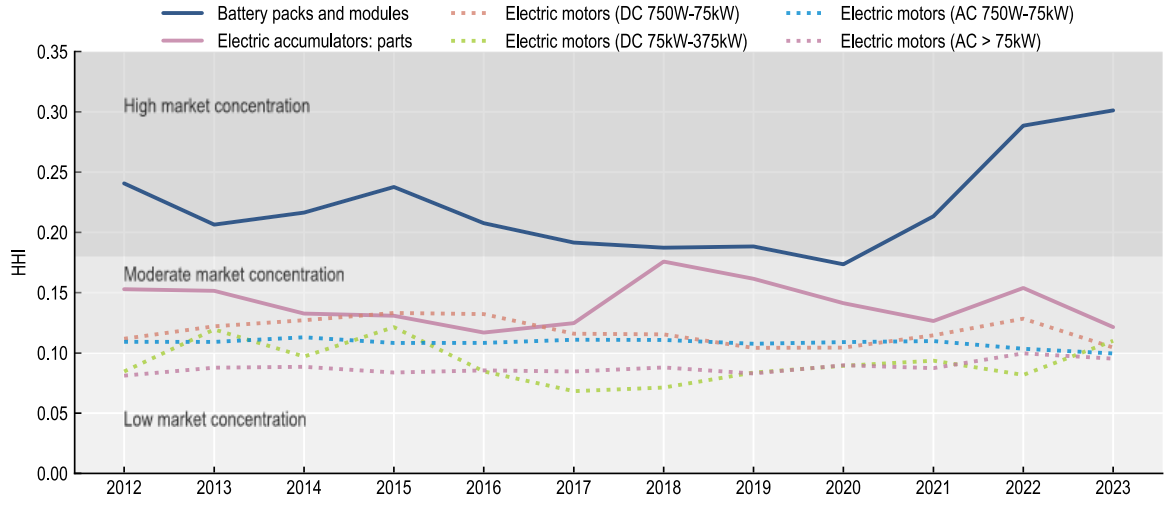
Herfindahl-Hirschman Index (HHI) of world exports of car and car parts



Note: Concentration is computed for each category of cars and parts by first summing total exports for each region of the 114 regions that reported 2023 data across the HS6 codes that fall into each category and then computing the HHI index = $\sum_{r=1}^{n} s_r^2$ where s represents the share of world exports of region r and n=114. See Table A B.1 for the list of HS codes considered in each passenger car and car parts type. HS codes pertaining to EV cars and parts are not available for all years. In 2017, HS codes hybrid cars were reported separately and accounted for less than 5% of total passenger car exports. Combining ICE and hybrid cars to compute the HHI would not significant change the conclusions drawn from the chart. The Anti-trust division of the US Department of Justice considers markets with an HHI between 0.1000 – 0.1800 to be moderately concentrated and HHI in excess of 0.1800 to be highly concentrated (after converting the DOJ ranges to a 0-1 scale. See https://www.justice.gov/atr/herfindahl-hirschman-index). The shading in the chart corresponds to these zones.
Source: UN Comtrade supplemented with ITC data for regions reporting 2022 data but missing 2023 in UN Comtrade.

Figure 4.3. The export market for battery packs and modules is highly concentrated

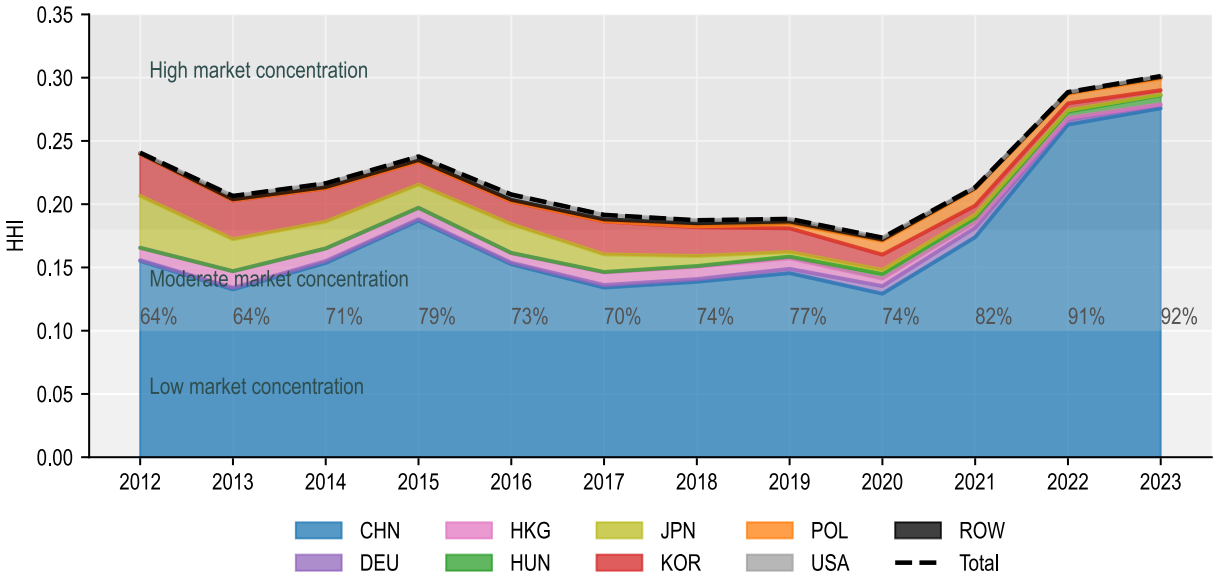
Concentration of EV parts at the HS6 digit level



Note: HS850760: 'Battery packs and modules', HS850790: 'Electric accumulators: parts', HS850132: 'Electric motors (DC 750-75kW)', HS850133: 'Electric motors (DC 75kW-375kW)', HS850152: 'Electric motors (AC 750-75kW)', HS850153: 'Electric motors (AC +75kW)'.
Source: UN Comtrade. 2023 supplemented with ITC data for regions reporting 2022 data but missing 2023 in UN Comtrade.

Figure 4.4. Export market concentration of EV batteries has increasingly been driven by China

Squared export market share by the top exporting countries

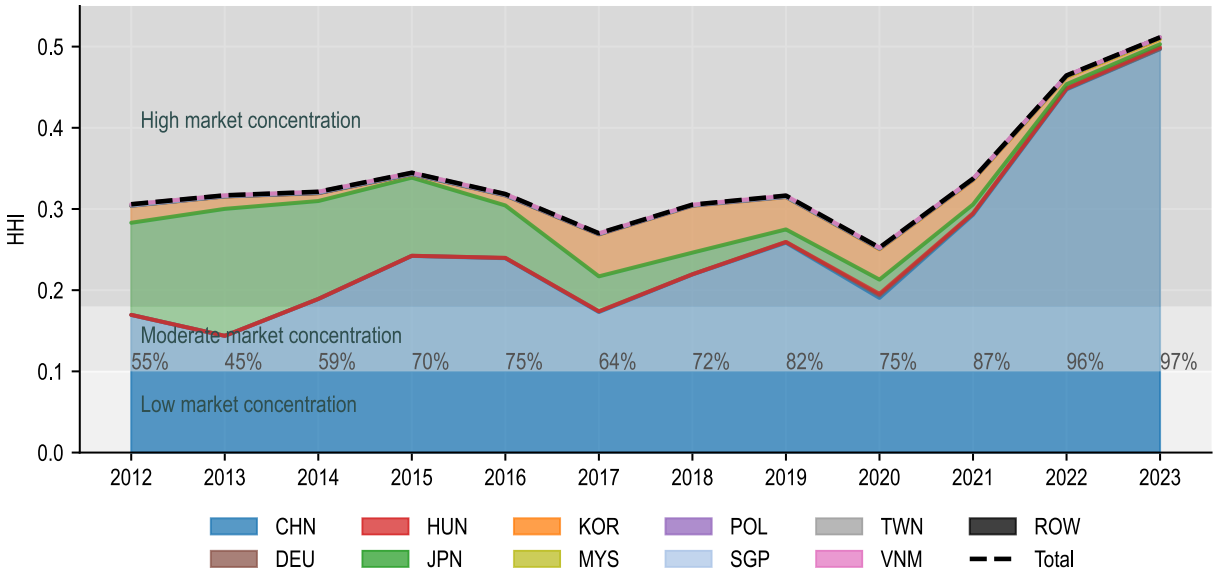


Note: This chart plots the value of s^2 for each region's (r) which is a squared export share component of the HHI computation: $\sum_{r=1}^{n} s_r^2$ where s represents the share of world exports of region r of product HS850760: 'Battery packs and modules' also referred to as EV batteries in the text. China's share of the HHI metric is noted on the chart for each year. Countries in the chart were the top countries (5) in the concentration index in any year.
Source: UN Comtrade supplemented with ITC data for regions reporting 2022 data but missing 2023 in UN Comtrade.

4.2. Concentrations from the perspective of individual importers

From an individual importer perspective, the concentration and the reliance on China for EV batteries can be even higher. US battery imports have increased from USD 1.3 to 18.8 billion between 2012 and 2023. During this period concentration of foreign supply has been high (Figure 4.5) and at a higher level than that of world supply (Figure 4.4). Early on, the United States sourced its EV batteries mainly from Japan and China. In 2012 Japan accounted for about a third of total battery imports into the United States while China accounted for 41.2%. Korea became another import source of EV battery supply around 2017 eventually becoming the number two EV battery supplier to the United States. However, since 2020, not only has market concentration peaked even further but the reliance on China has become more pronounced. In 2023, 70.5% of EV imports into the United States came from China and only 8.11% from Korea. As a result, 97% of the market concentration in 2023 can be attributed to US reliance on EV batteries from China.

Figure 4.5. Concentration of Imports of EV batteries, United States



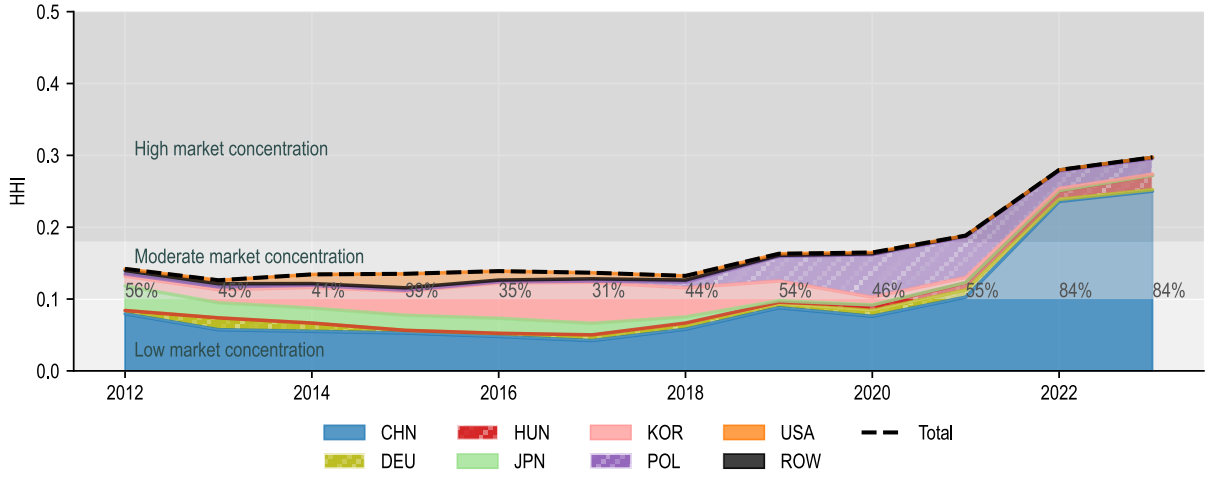
Note: This chart plots the value of s^2 for each region's (r) which is a squared export share component of the HHI computation: $\sum_{r=1}^{n} s_r^2$ where s represents the share of world exports of region r of product HS850760: 'Battery packs and modules' also referred to as EV batteries in the text. China's share of the HHI metric is noted on the chart for each year. Countries in the chart were the top countries (5) in the concentration index in any year.
Source: UN Comtrade supplemented with ITC data for regions reporting 2022 data but missing 2023 in UN Comtrade.

EU Members import batteries from a number of EU and non-EU countries, and until 2022 no one source accounted for more than 30% of total imports into the region. However, over the last two years the EV battery imports from China have more than tripled, increasing from USD 8.2 to 28.8 billion between 2021 and 2023. While imports also increased from many of the EU Members' other partners, both within and outside the European Union, none at the same magnitude. Imports from Hungary, for example, during the same period, increased by USD 5.6 billion and from Poland by USD 2.4 billion. Even considering intra-EU trade, concentration is high and has been rising since 2018 (Figure 4.6 Panel A). Focusing on imports among non-EU Members only (Figure 4.6 Panel B), the concentration is even higher and has increased sharply over the years becoming somewhat highly concentrated, driven in large part by the growth of EV battery imports from China. The growth in concentration among extra-EU suppliers of EV batteries, particularly from China, underscores a critical trade dependency risk for the European Union, as it reveals the region's increasing reliance on a single external partner.

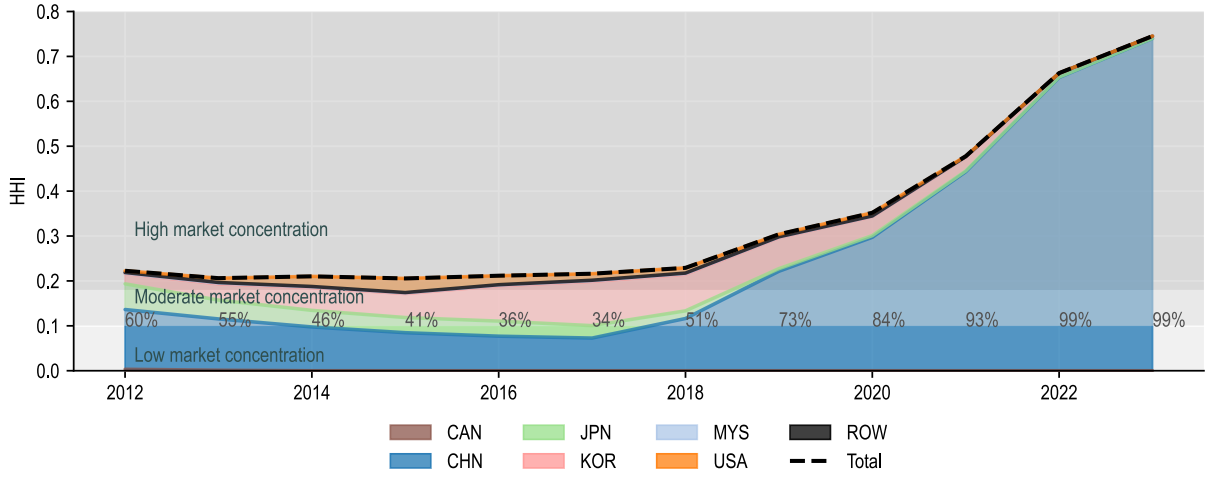
In sum, China controls a substantial portion of the global supply chain for critical battery components such as critical raw materials and the manufacturing capacity for battery cells, modules and packs. Despite the presence of alternative suppliers of EV parts such as Poland, Hungary, Germany, Korea, and the United States, their combined export share in 2023 (32.0%) remain below that of China (46.4%). Moreover, China's fast growth in electric vehicles exports has allowed it to increase its market share from just 1% in 2017 to 24% in 2023 placing China just below top exporter Germany (28%) but above Korea (10%) and Belgium (6.6%) in terms of market share. Accordingly, China's growing dominance in the EV and EV battery market poses potential significant challenges for car producing and consuming economies, such as the United States and the European Union, in terms of trade dependency in an industry which is increasingly seen as critical to the green energy transition and is centre stage in innovation and technological developments.

Figure 4.6. Concentration of Imports of EV batteries, EU27

Panel A: EU27, including other EU members as a source of imports



Panel B: EU27, considering only extra-EU27 trade partners



Note: This chart plots the value of s^2 for each region's (r) which is a squared export share component of the HHI computation: $\sum_{r=1}^{n} s_r^2$ where s represents the share of world exports of region r of product HS850760: 'Battery packs and modules' also referred to as EV batteries in the text. China's share of the HHI metric is noted on the chart for each year. Countries in the chart were the top countries (5) in the concentration index in any year. EU27 includes countries currently members of the European Union regardless of year. Striped areas in the chart represent EU partners.
Source: UN Comtrade supplemented with ITC data for regions reporting 2022 data but missing 2023 in UN Comtrade.

Notes

[1] Electric vehicle parts in this section cover only electric batteries and electric motors. It does not cover other parts specific to electric vehicles such as the charging port, electric power converter, and thermal cooling system among others.

[22] These figures predate recent announcements of further increases in import tariffs on EVs from China by the United States (from 25 to 100%; see https://www.whitehouse.gov/briefing-room/statements-releases/2024/05/14/fact-sheet-president-biden-takes-action-to-protect-american-workers-and-businesses-from-chinas-unfair-trade-practices/, accessed 20 August 2024), the European Union (recently adding countervailing duties up to 36%; see https://ec.europa.eu/commission/presscorner/detail/en/ip_24_4301, accessed 20 August 2024) and Canada (100% surtax, effective October 2024, in addition to the Most-Favoured Nation (MFN) import tariff of 6.1%; see https://www.canada.ca/en/department-finance/news/2024/08/canada-implementing-measures-to-protect-canadian-workers-and-key-economic-sectors-from-unfair-chinese-trade-practices.html, accessed 29 August 2024). In parallel, since 2018, China has increased its outward FDI to neighbouring countries, such as Mexico and Morocco, but also to the United States and the European Union, as Chinese producers has been shifting to local or regional production in response to more restrictive trade policies (Figure A B.3).

[3] In this section, references to "cars" as a finished and assembled product refers to passenger cars or motor vehicles that are principally designed to transport persons and not goods (HS 8703) and excludes vehicles covered under HS 8702 (vehicles used for public transport. Vehicles such as golf carts, snowmobiles and racing cars have also been excluded from the analysis. "Parts" are those products that could be used as intermediate inputs in the production of passenger cars but also other types of vehicles or other products. See Table A B.1 for the list of HS codes used in the analysis.

[4] Analysis in this section is based on the value of exports and imports.

[5] The world's first mass produced hybrid vehicle was the Toyota Prius, first released in Japan in 1997 (The History of the Electric Car | Department of Energy).

[6] Examining only trade data does not capture car production moving from one country to another. Additionally, cars produced in a country are not necessary produced only by national car manufacturer as discussed in (Mayer, Vicard and Wibaux, 2024[20]) who calculated that foreign brands still represent a large share of car exports from China (63% in volume terms in 2022).

[7] An EV battery, also called a pack, is made up of several modules. Modules are composed of a series of connected battery cells (Mayer, Vicard and Wibaux, 2024[20]).

5 Conclusion

This report contributes to the monitoring of trade developments in wake of multiple shocks and challenges which have been surfacing since the COVID-19 pandemic. While there is an expectation that trade will grow faster in 2024 and 2025, concerns remain about potential negative impacts on trade and output of high inflation, high interest rates, maritime transport disruptions and increasing trade and geopolitical tensions.

The analysis shows that relatively strong performance of services trade in 2023 was driven by travel-related services which were impacted more heavily by the pandemic travel restrictions in 2020-22 and which continued to recover still in 2023. The product composition of both goods and services trade has been shifting back towards the pre-pandemic structure. However, relatively large differences remain even now, particularly for services.

After the phase out of China's COVID-19-related restrictions, the country's trade and output grew faster than those for the OECD area and the world in 2023 and at the beginning of 2024 and this supported world trade growth. 2023 also saw some stark changes in the partner and product structure of China's trade which may be an indication of a more structural re-orientation of China's trade. The decline in China's import growth since the beginning of this year may be an indication of the country's economic slowdown which could have significant negative implications for global trade and the world economy. Meanwhile, the significant decline in Russia's goods trade balance in 2023 reflected a high base effect of soaring energy prices following Russia's invasion of Ukraine in 2022 as well as the effects of far-reaching trade and other economic sanctions on Russia.

In 2023, commodity prices have continued their decline, albeit this was from historically high levels reached following the COVID-19 pandemic and Russia's invasion of Ukraine. At the beginning of 2024, commodity prices remained higher than pre-pandemic levels despite subdued global GDP growth in 2023.

The recent transportation disruptions in the Suez and Panama Canals highlight the importance of understanding the relationships between trade and transportation including routes, chokepoints and shipping costs. Maritime transport accounts for almost half of internationally traded goods and it is a particularly important mode of transport for trade of energy-related and agricultural products. Shipments of these products account for most of the maritime traffic in the Suez and Panama Canals.

The rerouting of ships from the Suez Canal is resulting in longer transit times, shipping delays and increased costs, not only on the maritime routes crossing through the Suez Canal, such as those connecting Asia and Europe, but also on routes to and from the US East Coast due to the interconnectedness of maritime routes — which are already experiencing an additional upward pressure from the reduced capacity in the Panama Canal cause by drought. Adjustments have been taking place and, so far, the impacts have been limited, illustrating a degree of resilience of global trade to maritime transport disruptions. But the analysis also shows a range of effects which, if magnified or spread to other transport routes or chokepoints, may have more significant implications for global trade, prices and economic growth in the future.

Significant changes in the global EV landscape have been driven, in part, by China's rapid growth as key supplier in the electric vehicle supply chain – from critical raw materials to intermediate inputs such as EV batteries to final electric vehicles. Over the last two years, market concentration has increased driven by China’s expanding market presence. Similarly, the EV battery export market, long dominated by Japan, Korea, and China, has seen further concentration in recent years, particularly since 2021, with China's influence continuing to grow. Accordingly, China's dominance in the EV and EV battery markets is viewed as a significant challenge for other car-producing and consuming economies. This dominance raises concerns about trade dependency and resilience in an industry that is seen as increasingly crucial to the green energy transition.

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Annex A. Data and methodology

Trade data sources by mode of transport

Analysing trade by mode of transportation requires some background data work as a comprehensive global database on trade by mode of transportation does not exist yet. If the UN Comtrade database – a widely used dataset on international trade – contains a variable for modes of transportation, not all countries report this variable to the UN Statistical Division. For example, in 2022, around a third of all countries filled the mode of transportation variable for at least one trade flow at the HS 6-digits level. In this report, the UN Comtrade data were used for Australia, Brazil, Canada, and Türkiye. For the European Union, Japan and the United States, national and community sources were used, as they are not reported in the UN Comtrade dataset. However, some major economies, such as the United Kingdom or China, could not be included in the analysis, as trade data by mode of transportation is not publicly available at the moment. The countries included in the analysis database cover 29.5% of total value of exports and 33.4% of total import value in 2023.

Apart from gathering the data, some post-processing was applied to create a complete and comparable dataset. For the United States, two datasets were used: the Census data, provided by the US Census Bureau of the US Department of Commerce and the TransBorder dataset from the Bureau of Transportation Statistics of the US Department of Transportation. The Census data provides information on trade between the United States and all its trade partners by sea, air, and total mode of transportation. It does not contain specific information on rail, road and other modes of transportation. The TransBorder dataset compiles data on trade between the United States and Mexico and Canada by all modes of transportation. Since trade by rail and road to and from the United States occurs exclusively with Canada and Mexico, we merged those two databases to obtain dataset covering air, sea, rail, road and other modes of transportation.

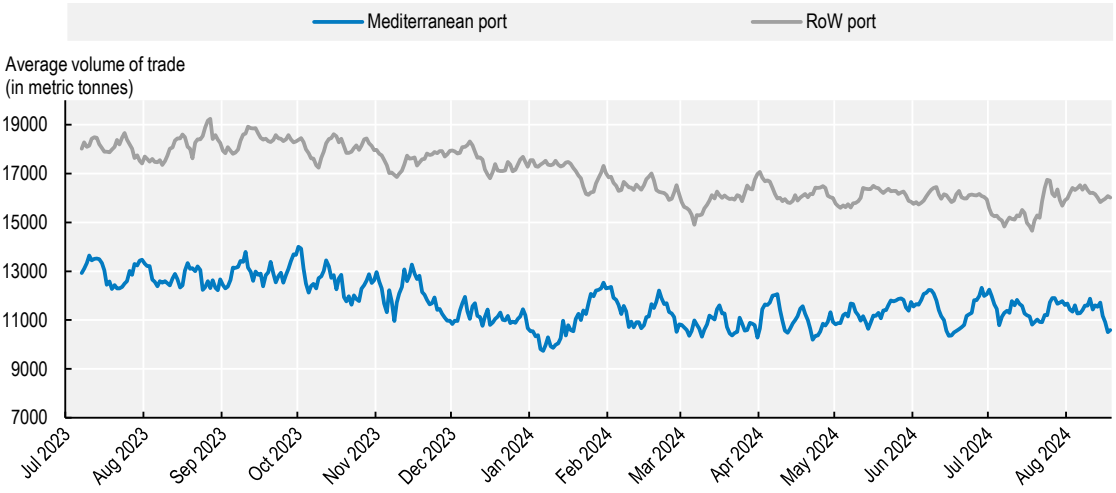
However, these two datasets do not have the same coverage in terms of commodities. While the Census data provides trade flows at the HS 6-digits level, the TransBorder dataset reports trade at the HS 2-digits only. Since we need HS 6-digits to group trade by main industries in our analysis, we estimated trade by modes of transportation for HS 6-digits. To do so, HS 6-digits trade flows for which the mode of transportation was unknown (i.e. not air or sea), were distributed into rail, road and other modes proportionally using the shares of trade by modes for their parent codes at the HS 2-digits level. For example, in 2023, imported value to the United States with unknown modes of transportation for HS 050690 was USD 3 540 473. In 2023, for its HS 2-digits parent code (05), trade flows which did not occur by air or sea were shipped at 87.4% by road, 4.2% by rail, 0.2% by other modes and 8.1% by unknown modes of transportation. Thus, we split USD 3,540,473 according to those shares: USD 3 094 621 was shipped by road; USD 149 579 by rail; USD 8 280 by other modes; and USD 287 993 by unknown modes.

European data were also adjusted. Eurostat provides extra-EU trade by mode of transportation for the EU aggregate at the time being: it means that data before 2020 corresponds to EU-28 while data from 2020 corresponds to EU-27. To obtain a comparable time series, the trade between the UK and the rest of the world prior to 2020 is excluded and the United Kingdom as a partner is excluded for 2020 and after. This way, a consistent dataset is obtained across the periods, corresponding to EU-27 trade with the rest of the world except the United Kingdom. Ideally, UK trade to the rest of the world and added UK trade with the European Union before 2020 would have been subtracted to obtain EU-27 data at each time period, but

the UK trade with the European Union is not available for each the period. This correction was done only when comparing across years that include dates prior to 2021. Figure 2.20 and Figure 3.1 are based on 2023 data as provided by Eurostat. Finally, Japanese and European data were converted to US dollar, using the OECD Exchanges Rates database.

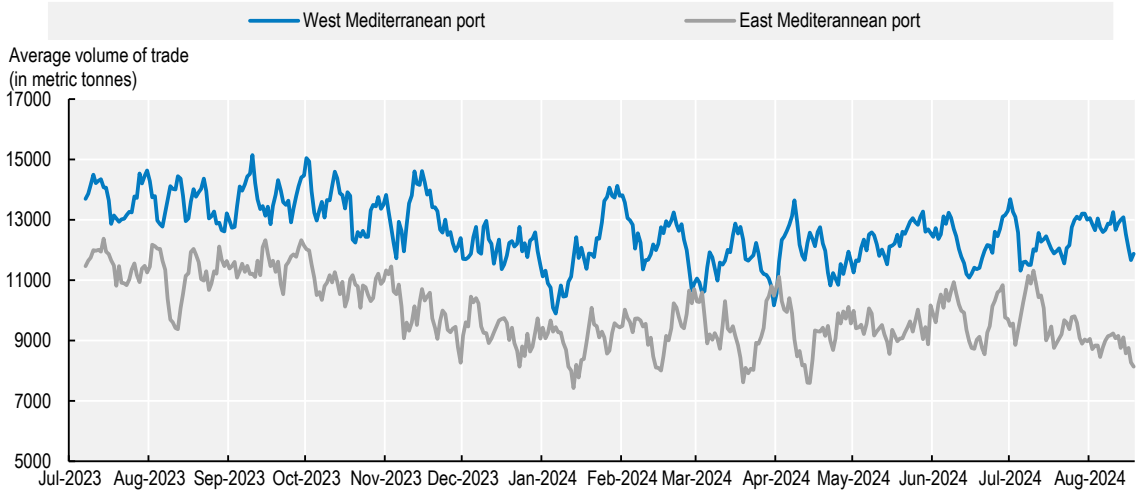
Annex B. Supplemental figures and tables

Figure A B.1. The alternative route to the Suez Canal avoided large disruptions in Mediterranean ports



Note: Seven-day moving averages, using daily data up to 18 August 2024. The volume of trade going through each chokepoint is estimated by the IMF using AIS data transmitted from vessels and collected by the UN Global Platform. The RoW port category includes all non-Mediterranean ports worldwide.
Source: IMF Portwatch (data extracted 10 September 2024).

Figure A B.2. The Suez Canal disruption did not have a significantly different effect on West or East Mediterranean ports



Note: Seven-day moving averages, using daily data up to 18 August 2024. The volume of trade going through each chokepoint is estimated by the IMF using AIS data transmitted from vessels and collected by the UN Global Platform. West Mediterranean includes ports from Algeria, France, Monaco, Morocco, Spain, Tunisia and some ports from Italy. East Mediterranean includes ports from Albania, Croatia, Cyprus, Egypt, Greece, Israel, Lebanon, Libya, Malta, Montenegro, Slovenia, Syria, Türkiye and some ports from Italy.
Source: IMF Portwatch (data extracted on 10 September 2024).

Table A B.1. HS codes for passenger car and parts used in the analysis

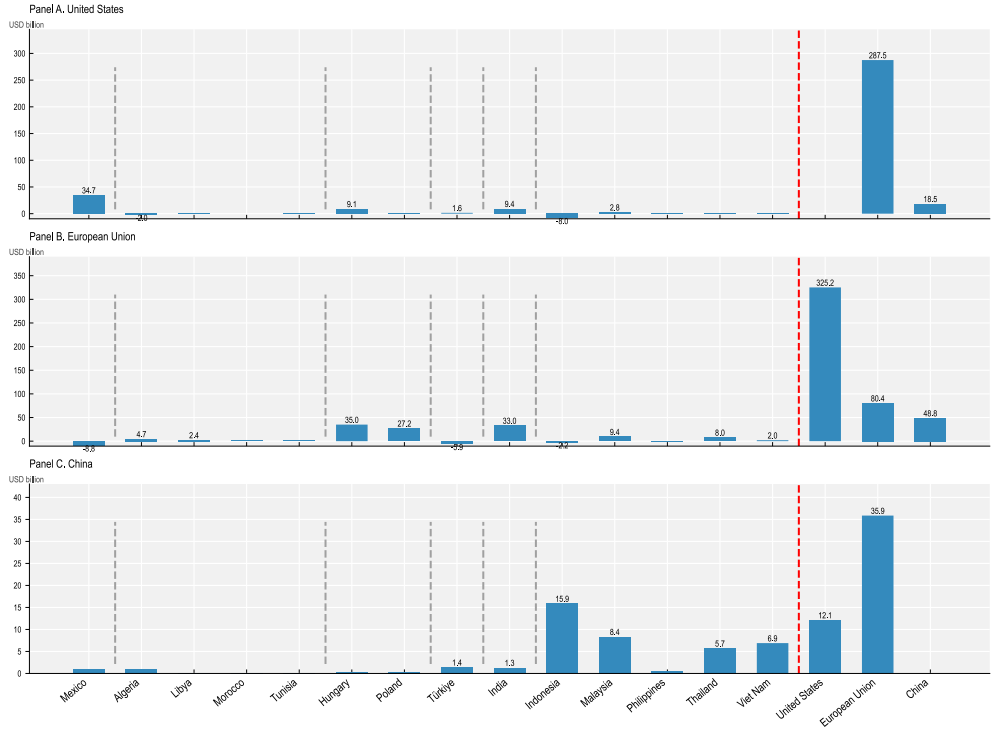
Type of vehicle	HS code	HS description
EVs		Final vehicles
	870380	Vehicles; with only electric motor for propulsion
		Specific parts and components*
	850760	Electric accumulators, including separators therefore, whether or not rectangular (including square) [8507] Lithium-ion [850760]
	850790	Electric accumulators; parts n.e.c. in heading no. 8507
	850132	Electric motors and generators; DC, of an output exceeding 750W but not exceeding 75kW
	850133	Electric motors and generators; DC, of an output exceeding 75kW but not exceeding 375kW
	850152	Electric motors; AC motors, multi-phase, of an output exceeding 750W but not exceeding 75kW
	850153	Electric motors; AC motors, multi-phase, of an output exceeding 75kW
Hybrids		Final vehicles
	870340	Vehicles; with both spark-ignition internal combustion reciprocating piston engine and electric motor for propulsion, incapable of being charged by plugging to external source of electric power
	870350	Vehicles; with both compression-ignition internal combustion piston engine (diesel or semi-diesel) and electric motor for propulsion, incapable of being charged by plugging to external source of electric power
	870360	Vehicles; with both spark-ignition internal combustion reciprocating piston engine and electric motor for propulsion, capable of being charged by plugging to external source of electric power
	870370	Vehicles; with both compression-ignition internal combustion piston engine (diesel or semi-diesel) and electric motor for propulsion, capable of being charged by plugging to external source of electric power
ICEs		Final vehicles
	870321	Vehicles; with only spark-ignition internal combustion reciprocating piston engine, cylinder capacity not over 1000cc
	870322	Vehicles; with only spark-ignition internal combustion reciprocating piston engine, cylinder capacity over 1000 but not over 1500cc
	870323	Vehicles; with only spark-ignition internal combustion reciprocating piston engine, cylinder capacity over 1500 but not over 3000cc

Type of vehicle	HS code	HS description
	870324	Vehicles; with only spark-ignition internal combustion reciprocating piston engine, cylinder capacity over 3000cc
	870331	Vehicles; with only compression-ignition internal combustion piston engine (diesel or semi-diesel), cylinder capacity not over 1500cc
	870332	Vehicles; with only compression-ignition internal combustion piston engine (diesel or semi-diesel), cylinder capacity over 1500 but not over 2500cc
	870333	Vehicles; with only compression-ignition internal combustion piston engine (diesel or semi-diesel), cylinder capacity over 2500cc
		Specific parts and components
	870840	Gear boxes and parts thereof
	870892	Vehicle parts; silencers (mufflers) and exhaust pipes; parts thereof
	870893	Vehicle parts; clutches and parts thereof
	840820	Engines; compression-ignition internal combustion piston engines (diesel or semi-diesel engines), of a kind used for the propulsion of vehicles of chapter 87
	840731	Engines; reciprocating piston engines, of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity not exceeding 50cc
	840732	Engines; reciprocating piston engines, of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 50cc but not exceeding 250cc
	840733	Engines; reciprocating piston engines, of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 250cc but not exceeding 1000cc
	840734	Engines; reciprocating piston engines, of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 1000cc
	851110	Ignition or starting equipment; spark plugs, of a kind used for spark or compression-ignition internal combustion engines
	851120	Ignition or starting equipment; ignition magnetos, magneto-dynamos and magnetic flywheels, of a kind used for spark or compression-ignition internal combustion engines
	851130	Ignition or starting equipment; distributors and ignition coils of a kind used for spark-ignition or compression-ignition internal combustion engines
	851140	Ignition or starting equipment; starter motors and dual purpose starter-generators, of a kind used for spark or compression-ignition internal combustion engines
	851150	Ignition or starting equipment; generators n.e.s. in heading no. 8511, of a kind used for spark or compression-ignition internal combustion engines
	851180	Ignition or starting equipment; n.e.s. in heading no. 8511, of a kind used for spark or compression-ignition internal combustion engines
	851190	Ignition or starting equipment; parts of the equipment of heading no. 8511, for use in spark-ignition or compression-ignition internal combustion engines
	840991	Engines; parts, suitable for use solely or principally with spark-ignition internal combustion piston engines (for other than aircraft)
	840999	Engines; parts for internal combustion piston engines (excluding spark-ignition)
		Parts and components common to EVs, Hybrids, ICEs
Any passenger car	870600	Chassis; fitted with engines, for the motor vehicles of heading no. 8701 to 8705
	870710	Vehicles; bodies (including cabs) for the motor vehicles of heading no. 8703
	870810	Vehicles; bumpers and parts thereof, for the vehicles of heading no. 8701 to 8705
	870821	Vehicles; parts of bodies, safety seat belts
	870822	Vehicles; parts and accessories, front windscreens (windshields), rear windows and other windows specified in subheading note 1 to this chapter
	870829	Vehicles; parts and accessories, of bodies, other than safety seat belts
	870830	Vehicle parts; brakes, servo-brakes and parts thereof
	870850	Vehicle parts; drive-axles with differential, whether or not provided with other transmission components, and non-driving axles; parts thereof
	870870	Vehicle parts; road wheels and parts and accessories thereof
	870880	Vehicle parts; suspension systems and parts thereof (including shock-absorbers)
	870891	Vehicle parts; radiators and parts thereof
	870894	Vehicle parts; steering wheels, steering columns and steering boxes; parts thereof
	870895	Vehicle parts; safety airbags with inflater system; parts thereof

Type of vehicle	HS code	HS description
	870899	Vehicle parts and accessories; n.e.c. in heading no. 8708
	940120	Seats; of a kind used for motor vehicles
	851220	Lighting or visual signalling equipment; electrical, of a kind used on motor vehicles (excluding articles of heading no. 8539)
	851230	Sound signalling equipment; electrical, used on cycles or motor vehicles (excluding articles of heading no. 8539)
	851240	Windscreen wipers, defrosters and demisters; electrical, of kinds used for cycles or motor vehicles
	851290	Lighting or signalling equipment; electrical, (excluding articles of heading no. 8539), windscreen wipers, defrosters and demisters; parts, of those kinds used for cycles or motor vehicles
	850710	Electric accumulators; lead-acid, of a kind used for starting piston engines, including separators, whether or not rectangular (including square)

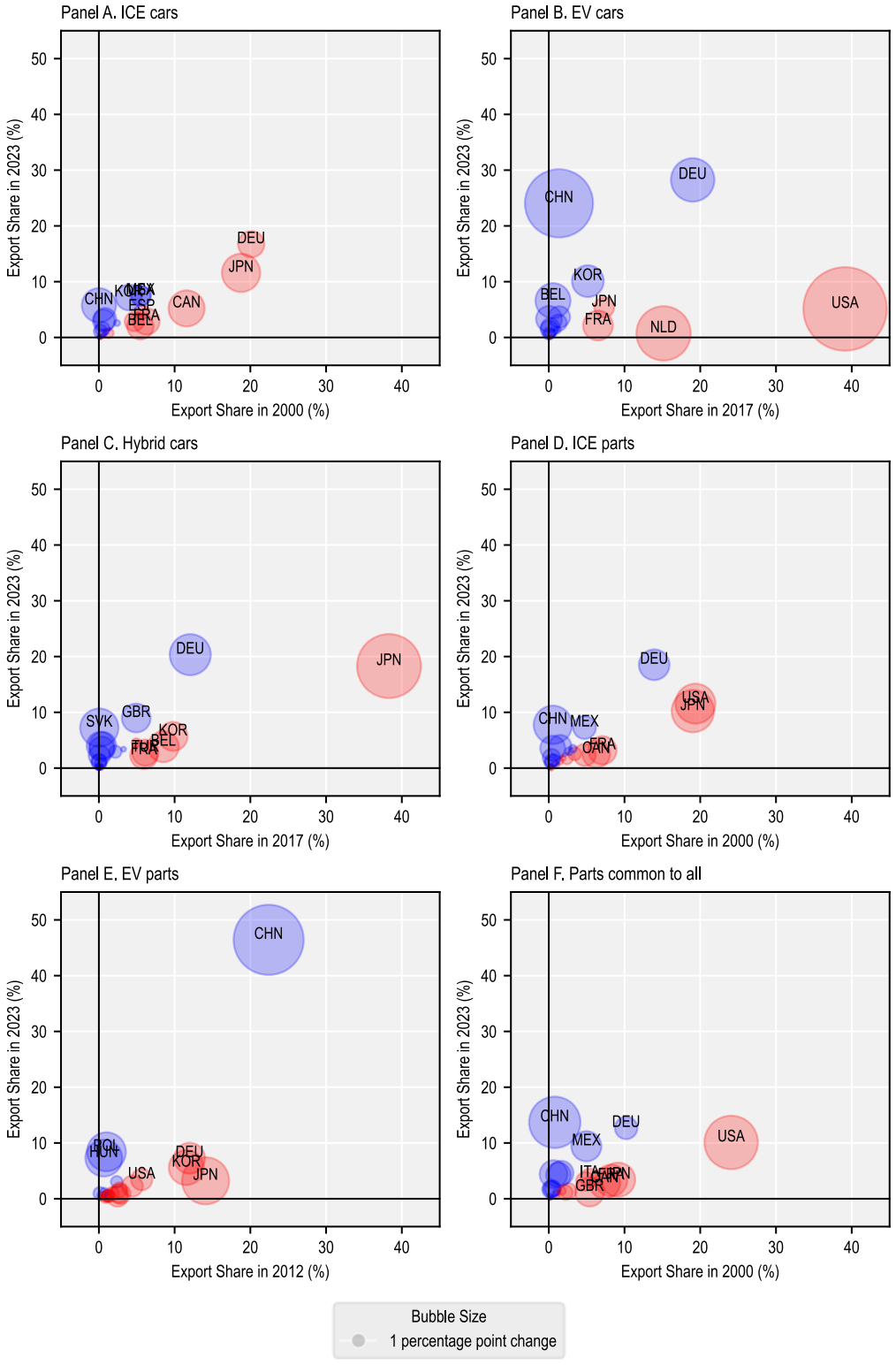
Note: *CEPII also refers to HS 850760 as battery pack and module. An EV battery, also called a pack, includes several modules. Modules are composed of battery cells. (Mayer, Vicard and Wibaux, 2024[20])
Source: Authors' compilation based on (Mayer, Vicard and Wibaux, 2024[20]) and (Coffin et al., 2024[21])

Figure A B.3. Change in outward FDI to connect countries between 2018 and 2022



Note: Outward direct investment positions (stocks). Connector countries are those with well-established linkages with the United States, the European Union, and China.
Source: IMF Coordinated Direct Investment Survey.

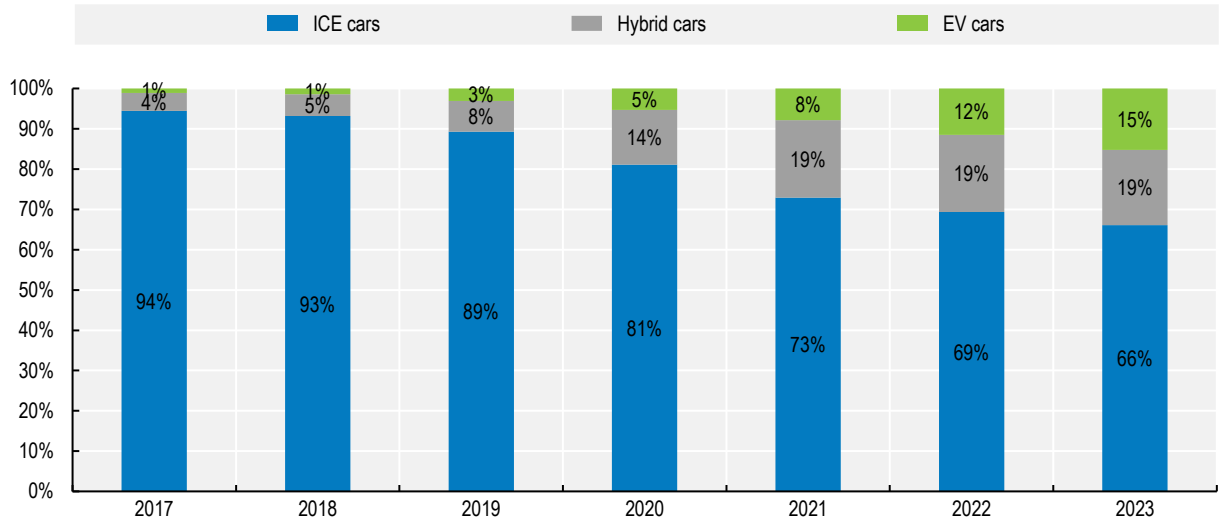
Figure A B.4. Top countries gaining and losing market share



Note: Countries in the chart are those who were among the top 10 exporters in any passenger car and car parts category between 2000 and 2023. Size of the bubble indicates the size of the change in market share between 2000 and 2023. The colour of the bubble indicates the direction of change. Red indicates countries that lost market share. Blue indicates countries that gained market share.
Source: UN Comtrade supplemented with ITC data for regions reporting 2022 data but missing 2023 in UN Comtrade.

Figure A B.5. Electric vehicles exports are accounting for a larger share of car exports

Share of total export value of each car type



Note: Includes only regions who reported in 2023.
Source: UN Comtrade supplemented with ITC data for regions reporting 2022 data but missing 2023 in UN Comtrade.

Risks and Resilience in Global Trade

KEY TRENDS IN 2023-2024

This OECD report highlights recent developments and disruptions in international trade using detailed and high-frequency data to offer in-depth monitoring of the evolving trade landscape and the factors underlying recent changes – including the recent recovery of travel-related services, China's shifting trade dynamics, and the impacts of Russia's war of aggression on Ukraine. It also examines transportation disruptions in critical maritime chokepoints and the increasing concentration of global trade in electric vehicles and batteries, raising dependency concerns.

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