



International trade during the COVID-19 pandemic: Big shifts and uncertainty

10 March 2022

International trade plunged in 2020 but recovered sharply in 2021. While total trade flows are now comfortably above pre-pandemic levels, trade impacts across specific goods, services and trade partners are highly diverse, creating pressures on specific sectors and supply chains. The changes in the trade structure caused by the COVID-19 pandemic in a single year was of a similar magnitude to changes otherwise typically seen over 4-5 years. Substantial imbalances across trade partners and products remained at the end of 2021, and not all of the accumulated losses from the earlier steep declines were recuperated. The heterogeneity of trade impacts and changes in trade flows across products, sources and destinations signifies high uncertainty and adjustment costs, and implies additional incentives for consumers, firms and governments to adopt new — or to intensify existing — risk mitigation strategies.



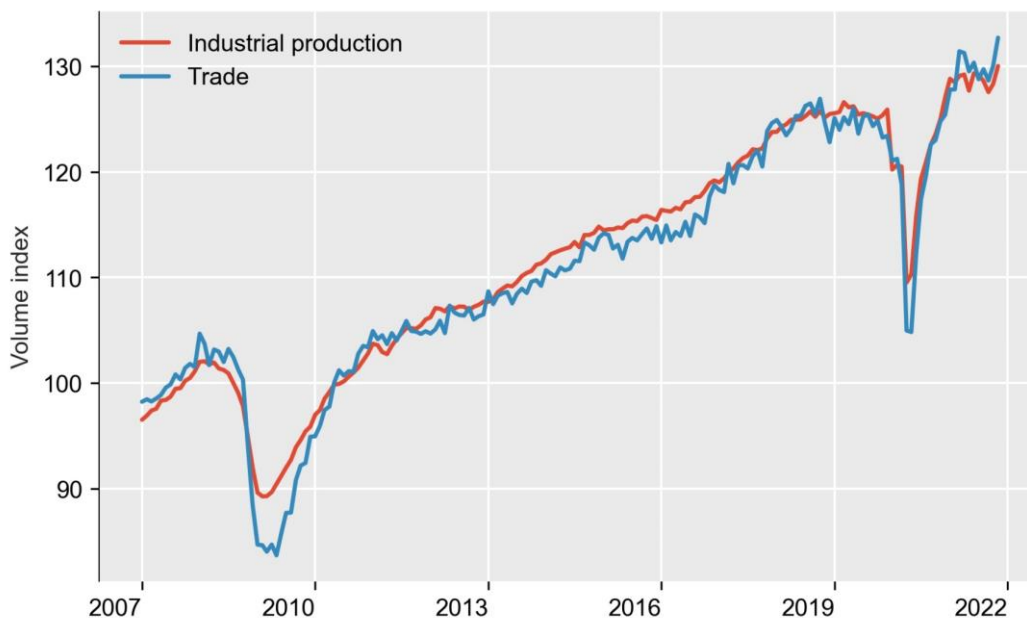
What happened to international trade in 2020 and 2021?

The year 2020 was marked by some of the largest reductions in trade and output volumes since World War II. The declines in both world industrial production and goods trade in the first half of 2020 were of similar depth to those at the trough of the Global Financial Crisis (GFC). Nevertheless, they materialised and disappeared more quickly, facilitating a V-shaped recovery in 2020. Trade continued to grow strongly in 2021 and has compensated some, but not all, of the accumulated losses from the steep declines seen earlier.¹

Initial pandemic-era expectations for a double-digit decline in world merchandise trade in 2020 did not materialise. The volume of global trade has recovered to the pre-pandemic level at an extraordinarily fast pace from around mid-2020 (Figure 1).

Figure 1. Volume of world trade and industrial production

Seasonally adjusted (2010=100)



Source: OECD calculations based on CPB World Trade Monitor.

However, the relatively positive performance of aggregate trade hides considerable differences across products, economic sectors and trading relationships. The trade collapse of early 2020 did not hit all products to the same extent and the rising tide did not lift all parts of the global trade system equally either. Trade impacts across specific goods, services and trade partners show a highly diverse picture and created pressures on specific sectors and supply chains that were much more pronounced than during the GFC.

In 2020, trade in services declined more and has been recovering at a slower pace than goods trade. Not surprisingly, trade in travel and tourism services slumped dramatically but trade in digitally delivered services, such as telecommunication and information technology services, boomed. Overall, the value of

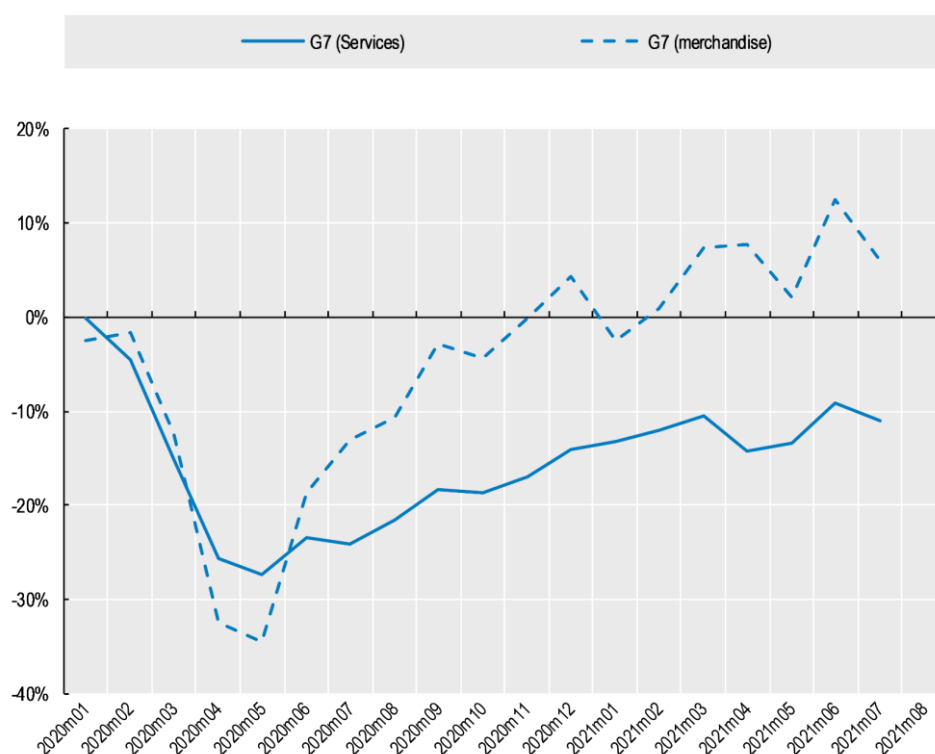
¹ Parts of this note rely on material from Arriola, Kowalski and van Tongeren (2021_[1]). Where possible this was updated with the most recently available information.



exports of services in OECD countries declined in 2020 by -16.7%, twice as much as the value of goods exports, which dropped by -8.2%. This was also one factor underpinning the comparatively large adjustments in output relative to those in trade, as services account for a larger share of the economy than their weight in international trade (Figure 2).

Figure 2. Services trade was hit harder and has been slower to recover than goods trade

Exports of services and merchandise relative to same month in 2019. G7 economies

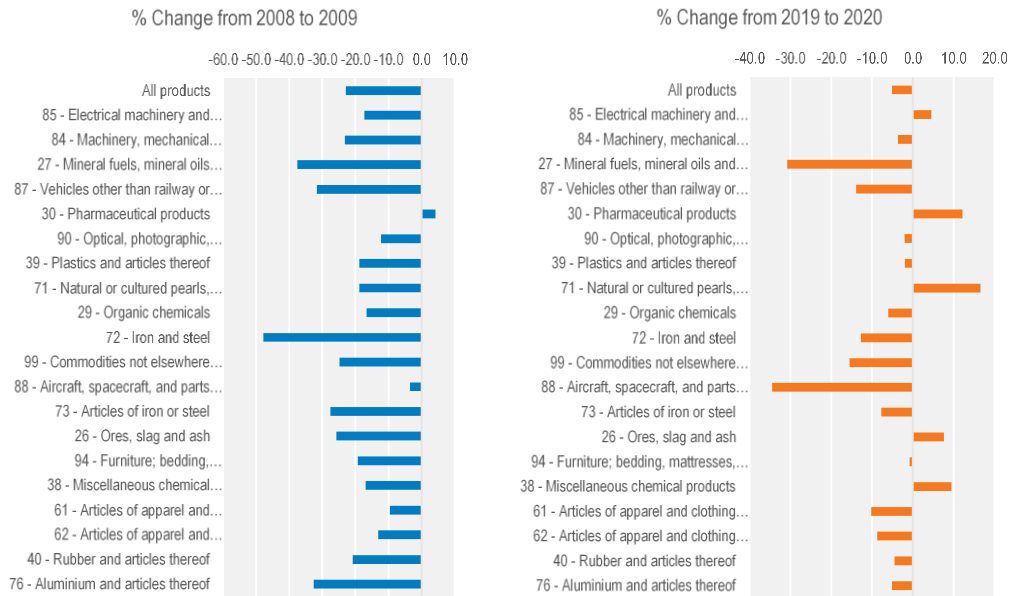


Source: OECD calculations using WTO data in current USD.

Trade in several types of goods and services plummeted, while trade in others increased markedly. The product structure of merchandise trade changed significantly: trade in several products nosedived (e.g. fuels, aircrafts, cars, mechanical machinery, steel), while trade in some other products increased (e.g. protective equipment and pharmaceutical products, food, and 'home nesting' products such as domestic appliances and electronics) (Figure 3).

Our analysis of the data shows that the variation in trade impacts across the different product categories in 2020 was not only larger than during the GFC, but also larger than in any other year in the past two decades. The changes in the trade structure caused by the COVID-19 pandemic in a single year was of a similar magnitude to changes otherwise typically seen over 4-5 years.



Figure 3. Changes in trade of 20 most traded products

Note: The top-20 traded products ranking was established based on the value of trade (exports + imports) in 2019 exports. The numbers in product descriptions are abbreviations of 2-digit Harmonised System codes of product classification.

Source: Arriola, Kowalski and van Tongeren (2021^[11]).

Some international supply chains came under pressure in the early months of the pandemic due to extraordinary demand (e.g. for personal protective equipment), but the data also show that some major supply chains remained resilient and were instrumental in the recovery of the economy in late 2020. Trade of parts and components used for the manufacture of passenger motor cars, for example, decreased less rapidly and recovered more quickly than trade of finished passenger motor cars (Figure 4), suggesting that in 2020 demand for motor cars plummeted while production and supply chain planners kept replenishing the components hoping the demand would return soon.

Another example is the semiconductor industry, where shortages of supply have been reported to contribute to disruptions in downstream industries during the COVID-19 pandemic. This may have been the case for some downstream users but trade data indicate that trade in semiconductors^{2,3} has been expanding overall at a fast pace. In 2020, the value of exports of the 10 largest exporters grew by 11.5% over 2019, and in the period January-April 2021 they grew by an impressive 26.3% over the same period in 2020. While some top suppliers saw negative growth rates early in 2020, these turned positive over the year (Figure 5).

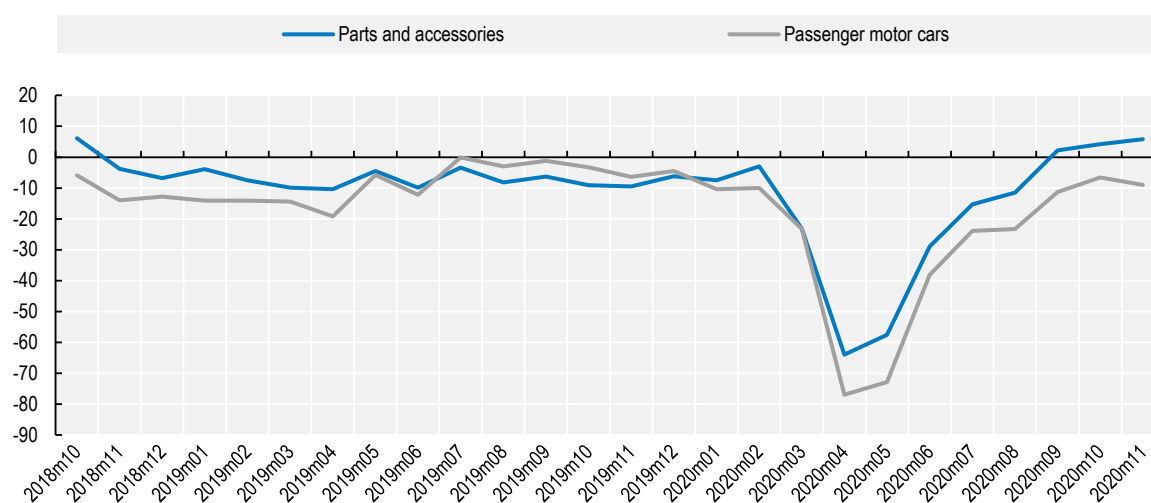
² Defined here as products belonging to the HS 4-digit category: electronic integrated circuits and micro assemblies, HS-8542.

³ The demand surge in 2020 was initially related to increased demand for 'lockdown consumer durables', such as televisions sets, video-game consoles, appliances, and computer equipment, and fuelled by government stimulus. More recently (2021 Q1-Q2), further demand has reportedly been fuelled by resurgent crypto currency mining.



Figure 4. Exports of passenger motor cars and car parts and accessories

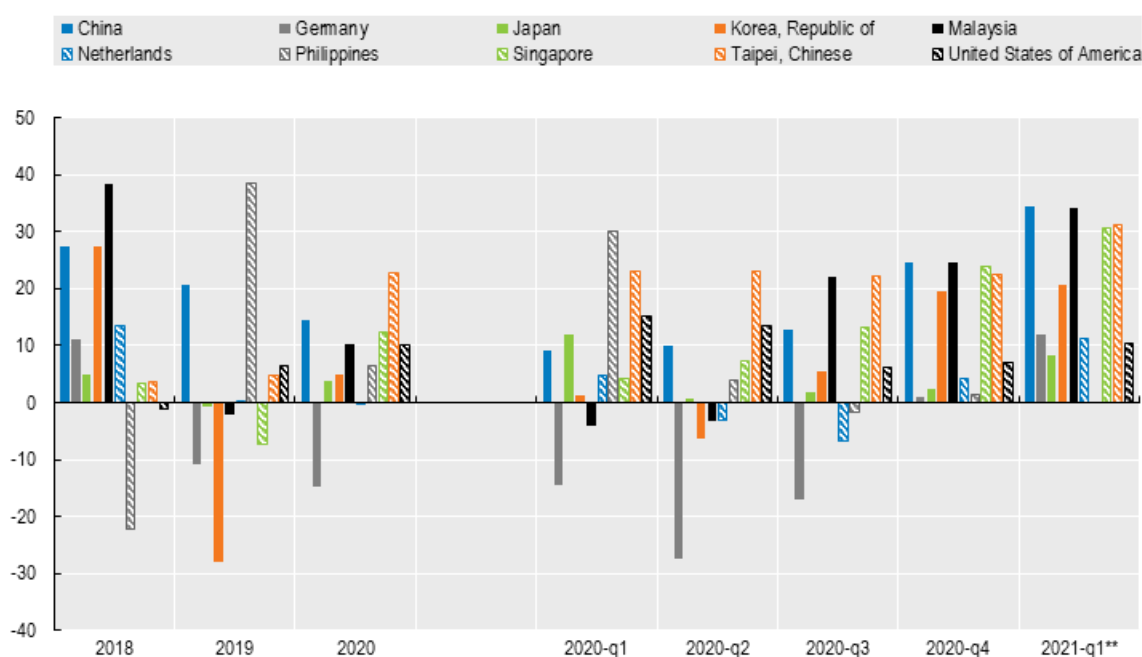
Year-on-year growth rates (%)



Source: Arriola, Kowalski and van Tongeren (2021^[11]) based on ITC's Trade Map database, Broad Economic (BEC) classification into parts and accessories (adjusted to only cover car parts and accessories) and passenger cars.

Figure 5. Supply of semiconductors (HS-8542) during the COVID-19 pandemic (10 largest suppliers)

Year-on-year growth rates (%) in the value of exports to all countries by source country



Note: The ranking of the world's largest world suppliers is based on world export shares in 2019.

** The first 'quarter' of 2021 covers the period Jan-April 2021 and the comparison is with the period Jan-Apr 2020.

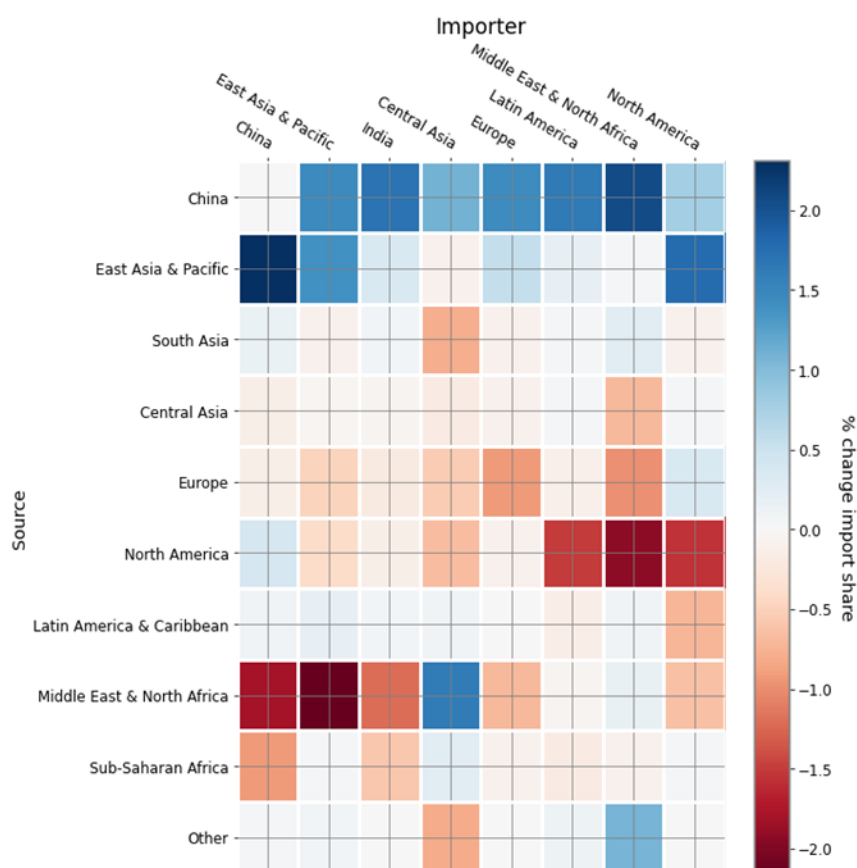
Source: Authors' calculations based on ITC's Trade Map database.



Overall, the cumulative value of semiconductor exports of the ten largest exporters during the pandemic between January 2020 and April 2021 was 17.3% higher than that which would normally be expected based on 2019 trends.^{4,5}

Asia was at the heart of supply chain developments in 2020, with China seeing a significant expansion of demand for its exports (Figure 6). The distance travelled by imported products also continued to increase in 2020, largely as an effect of China and other Asian countries filling supply gaps resulting from lockdowns and changes in demand. These shifts occurred in the context of significant perturbations in the international transport sector.

Figure 6. Reallocation of import shares in 2020



Source: OECD calculations based on ITC's Trade Map database (extracted June 2021).

⁴ To what extent were these developments driven by increasing prices of semiconductors? Price comparisons of semiconductors are complicated due to the varied nature of products exported from any given country, involving a mix of high-end, high-margin chips and low-end, low-margin chips (e.g. standard memory chips or chips used in motor vehicles). The latter type of chips can be more "commoditised" and tend to experience more volatile prices. Nevertheless, unit prices calculated from trade statistics for four large exporters reveal that landed prices have indeed been rising, but with significant differences across exporters. In June 2021, the unit price of semiconductors exported by Germany was 49% higher than in January 2020, while those of Chinese Taipei were 17% higher. Such disparate price developments suggest significant cross-region differences in semiconductor supply chains for different end uses.

⁵ Note that due to several developments such as chip hoarding in 2018, falls in construction of new data centres and less crypto currency mining in 2019, semiconductor trade was sluggish in 2019.



Trade growth in 2021: New impetus or clearing the backlogs from 2020?

In 2021, both the volume and (year-on-year) growth rates of world trade reached historical highs in May and June. This is partially a reflection of severely disrupted trade in the first half of 2020 (leading to a low base), combined with the effect of releasing pent-up demand from 2020, as well as shifts of demand from services to goods, and an unwinding of the backlogs in international supply chains. Demand has resumed particularly for non-perishable goods, where production and delivery can be delayed in time such as semiconductors, plastics, furniture and bicycles.

In many countries, after a period of temporary de-confinement at the end of 2020, the beginning of 2021 was again marked by a wave of lockdowns and restrictions, which weighed on demand, supply and international trade. The recovery during the first half of 2021 continued to be uneven across countries and its pace continued to evolve over time. The growth in China's trade, exports in particular, was notably faster than that of other large economies in the second half of 2020 and early 2021.

One way to assess the impact of the pandemic and subsequent recovery is to compare traded volumes with the levels that would typically be expected during a similar period in 'normal' times, accounting for both the trade collapse in the early stages of the pandemic and the recovery since late 2020. The left panel of Figure 7 shows how world trade has evolved relative to historical trend.⁶ Until June 2020, there was a shortfall of trade flows relative to what could be expected based on the trend. After June, trade flows recovered and by November 2020 they were above trend levels.

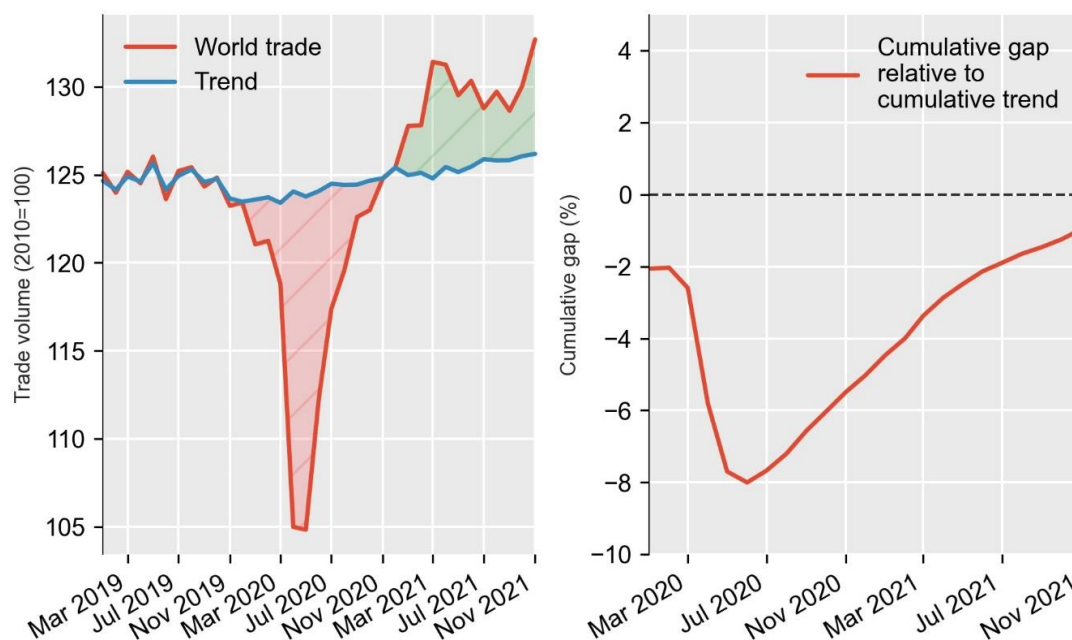
Another approach is to compare accumulated trade volume flows during the pandemic with what it would have been absent the pandemic, as shown in the right panel of Figure 7. The sum of negative and positive deviations from trend indicates whether the total accumulated volume of flows – that is a stock – is larger than usual or not.

The 8% "gap" in global merchandise trade volumes that unfolded in May 2020 was significantly reduced in late 2020 and throughout 2021. By November 2021, the accumulated volume of trade realised since the beginning of the pandemic was still 1% lower than that which would normally be expected. World trade volumes would need to expand by about 2.8 percentage points from the November level to close the gap by March 2022.

⁶ The trend estimation and extrapolation uses a Theta model. This method fits a simple exponential smoothing (SES) model to monthly data between January 2010 to December 2019 (the log-likelihood estimate of SES smoothing parameter is 0.74) and then extrapolates the trend for all months from January 2020 onward using a weighted average (the weighting parameter *theta* is set to 2) of the SES and a linear time trend (the OLS estimate of the time coefficient is 0.23). See, for example, Hyndman and Billah (2003^[6]).



Figure 7. Trade gap relative to trend



Source: OECD calculations based on CPB World Trade Monitor.

Substantial imbalances remained in the second half of 2021

China's production was hit deep in January 2020 but it rebounded much quicker than production in other regions. This supported meeting demands by other countries for "home nesting" products and certain medical products and led to a steep rebound of exports. The US and Euro Area production recovered later, and the gap with historical trend volumes is not closed yet. While Euro Area imports aligned closely with production, the United States has seen imports surging more than industrial production, signalling important macroeconomic channels contributing to these imbalances. The cumulative export gap of the United States was still negative at around 8% by November 2021, while the import gap was closed in May 2021 and settled at positive 1.8% in November as imports were substantially above pre-pandemic trend. (Figure 8).

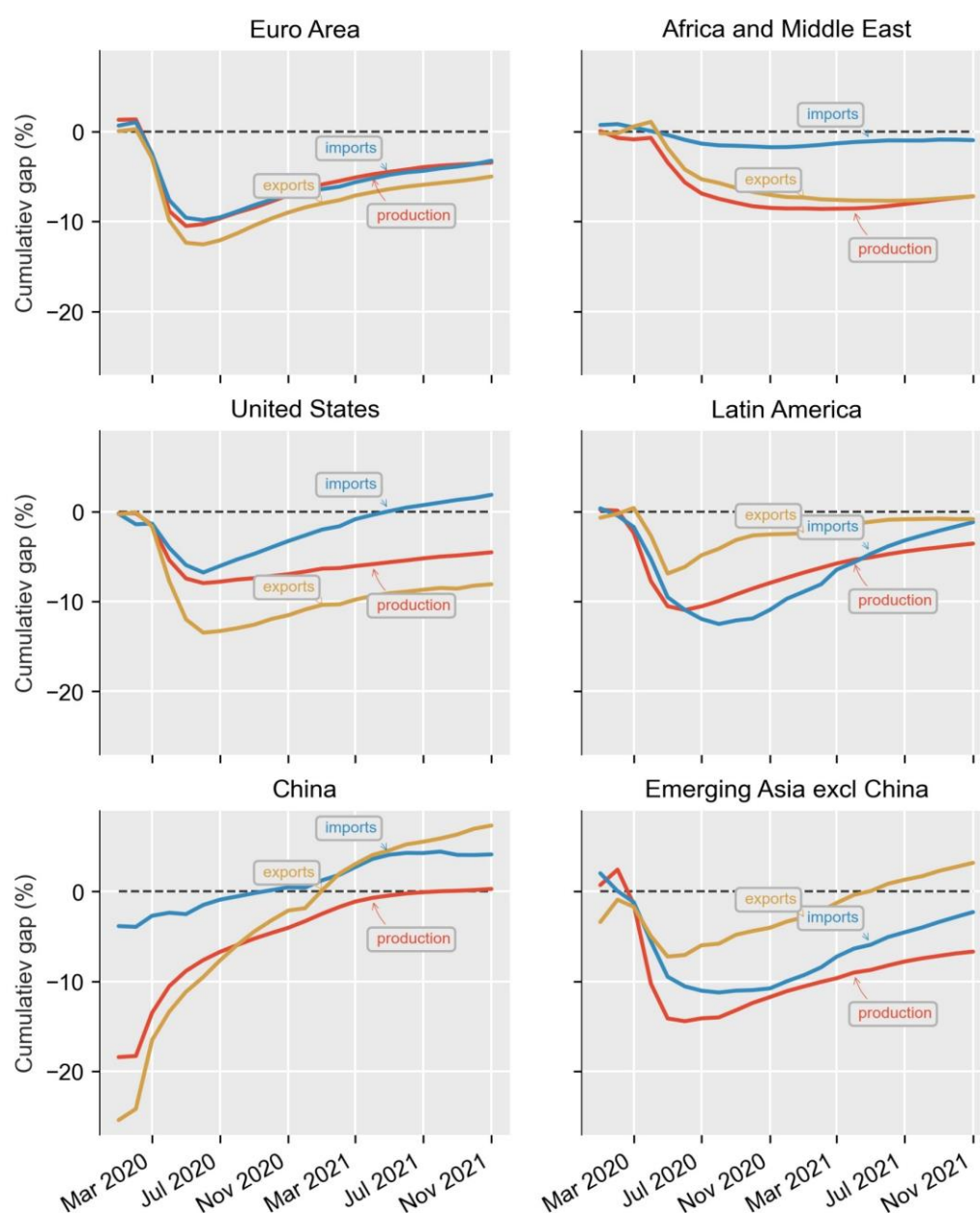
Exports of emerging economies in Asia recovered in the wake of China's rebound, though not as spectacularly. Latin America sustained its exports to some extent, mainly driven by raw materials. But recovery of Africa and the Middle East lags behind, with production and exports far behind trend and imports continuing at past levels.

As a result, China's share in world exports climbed from 12% in December 2019 to 15% in January 2021, but has since come down to 13% in November 2021. With the Chinese economy recovering relatively early in 2020, China's import market share increased somewhat in 2020, but has since levelled.



Figure 8. Trade and production gaps, major traders

Gaps relative to trend



Note: Data include intra-regional trade.

Source: OECD calculations based on CPB World Trade Monitor.

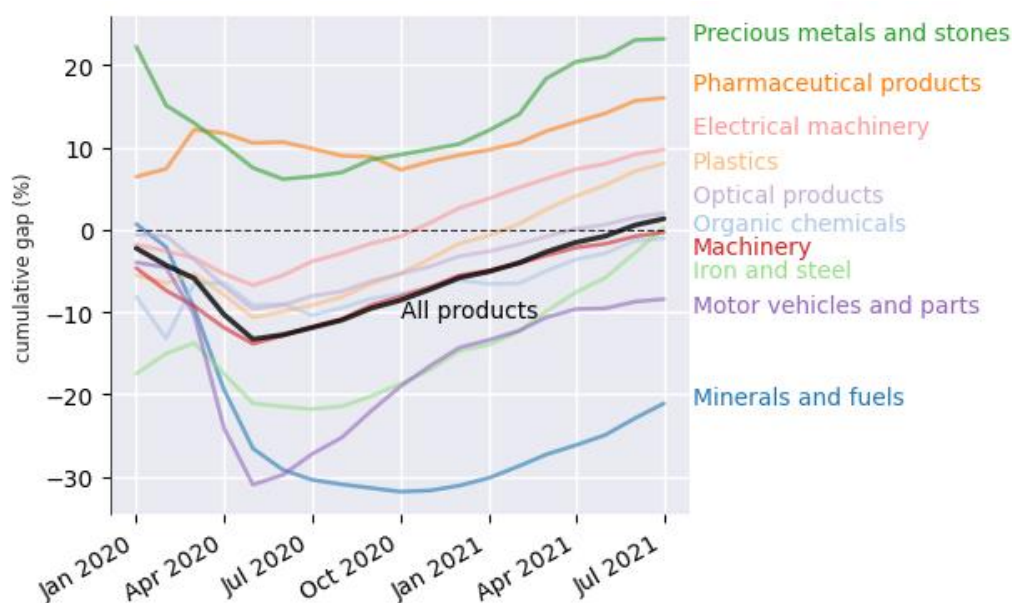
Closing of trade gaps has also proceeded unevenly across different product categories. Among the top-10 products traded before the pandemic, only four saw their trade gaps close decisively by the end of April 2021. *Precious metals and stones*, which seem to have played a role as 'safe value haven', and *Pharmaceuticals*, for which demand grew world-wide, recorded large positive trade gaps throughout the pandemic and had positive gaps of, respectively, 23% and 16% in July 2021. *Electrical and electronic machinery and equipment* and *Plastics* saw their negative gaps fall from mid-2020 onwards and close in October 2020 and February 2021 respectively, reflecting a combination of increased volumes of trade (due



to increased consumer demand), as well as rising prices. In contrast, the gap in the value of trade of *Mineral fuels and oils* was still at -21% and the gaps for *Motor vehicles* and *Organic chemicals* were also still negative (-8.4 and -1%, respectively). Some of the rise in trade values is driven by higher prices, so not all the closing of product gaps in Figure 9 is due to high trade volumes.

Figure 9. Gap in cumulative trade value during 2020-2021 for top 10 products traded in 2019

Gap relative to trade in the same months in 2019



Source: OECD calculations, based on data from ITC.

The transport sector continued to recover in 2021, but pressures remain on transport costs

Maritime shipping is central for goods trade. Illustratively, more than 85% of EU imports from China including iron and steel products, furniture and bedding, toys games and sports equipment, travel by sea. Further, even for goods such as electronic and optical products, which are sometimes shipped by air, the share of sea transport exceeds 40%.

Global container shipping, which is at the heart of global supply chains, continued to recover in both late 2020 and in 2021. Nevertheless, both bulk freight rates and container freight rates have been rising since mid-2020, and by mid-2021 reached the highest levels since the GFC (Figure 10). Record high freight rates contributed to record revenues and earnings for shipping companies. Container freight rates have been on a particularly steep rise throughout 2021, but towards the end of the year, forward prices are lower than spot prices, indicating that pressures are easing off. The industry is adding vessel capacity and in the medium term, the blockages at important sea ports are expected to ease.

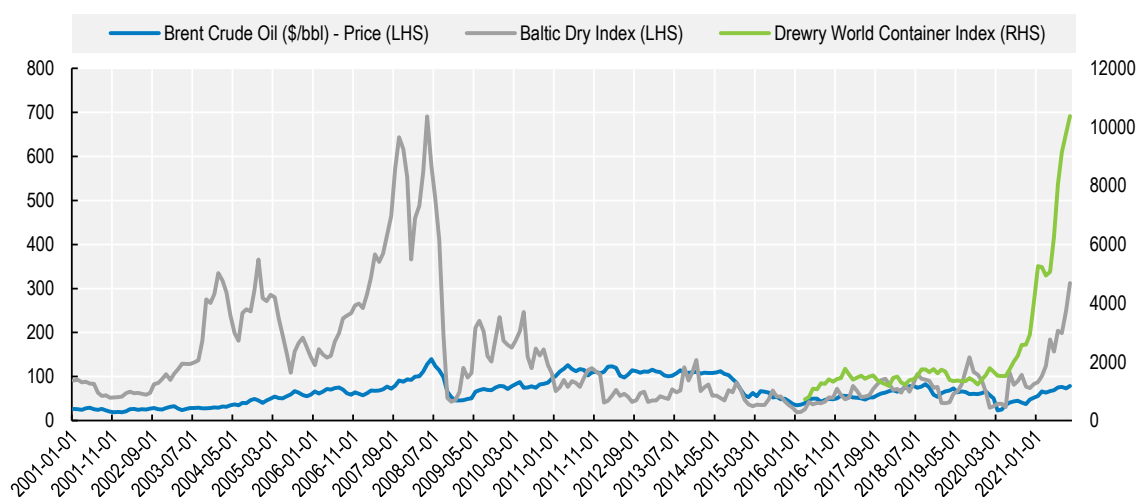
While crude oil prices have recovered from their pandemic-induced lows and are contributing to inflationary pressures, they do not explain the scale of increase in maritime transport prices.⁷ First, the increase in maritime freight rates began notwithstanding the very low fuel prices in the second quarter of 2020, which

⁷ Price of fuel oil, which is used for maritime transport, is closely correlated with price that of crude oil.



were at levels last seen in the early 2000s. Second, while crude oil prices are now back to their 2018-19 levels, shipping costs are much higher than in pre-pandemic times. This suggests that constraints on vessel capacity, not enough containers being available at the right port at the right time, and maritime and on-shore logistics bottlenecks continue to be the main factor behind rising maritime freight rates. These upward pressures on maritime freight rates are also likely aided by the continued but still not full — and regionally uneven — recovery of the air freight.

Figure 10. Costs of maritime transport



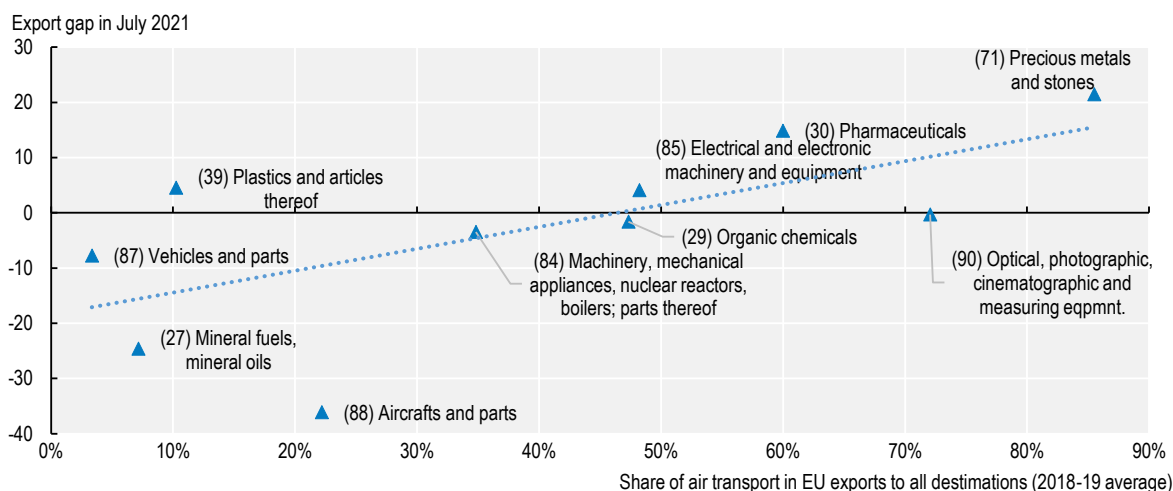
Source: Factset, Drewry and OECD Economic Outlook database.

The high dependency of international trade on maritime transport can be illustrated with trade developments by mode of transport. In the European Union, for which trade data by transport mode are available, products traditionally transported by sea were affected more negatively during the COVID-19 pandemic than those traditionally exported by air. Looking at the relation between export gaps and dependence on exports by air, we see that European Union's exports recorded the smallest negative gaps or the largest positive ones in products which it typically exports via air (*Precious metals*, *Optical instruments*, *Pharmaceuticals*, and *Electronics*) (Figure 11, Panel A). The deepest negative gaps were recorded for products that are typically not exported by air such as *Mineral fuels* (99% exported by sea transport), *Vehicles* (85% by sea and further 10% by rail) or *Plastics* (77% by sea and only 17% by air) (Figure 11, Panel B).

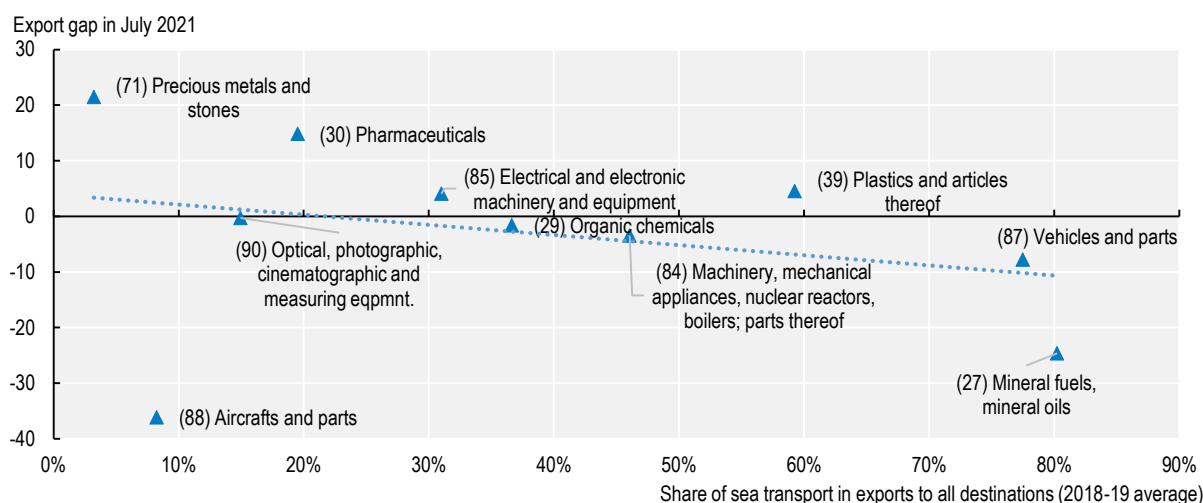


Figure 11. Recovery of trade by mode of transport

Panel A. Trade gaps for 10 largest EU's exports to all destinations by share of air transport in exports



Panel B. Trade gaps for 10 largest EU's exports to all destinations by share of sea transport in exports



Note: Export gaps are relative to historical 2019 data as reference level for hypothetical trade.

Source: OECD calculations, based on data from ITC and Eurostat.

Concluding remarks: Keeping track of trade developments

International trade in 2021 has recovered sharply from the slump in 2020. Despite impressive growth rates of world trade flows, the accumulated losses were not yet recuperated by the end of 2021, but the gap can be expected to close in the first quarter of 2022. While total trade flows are now comfortably above pre-pandemic levels, trade impacts across specific goods, services and trade partners are highly diverse and have been creating pressures on specific sectors and supply chains. Substantial imbalances across trade partners and products remained at the end of 2021, most notably an increased merchandise trade surplus in Asia and a widening merchandise trade deficit in the United States as well as in Africa.



While it is still unknown which of the structural changes seen in 2020 and 2021 will only be short-lived, some seem to suggest longer-term shifts or seem likely to result in long-term adjustments. The pronounced shift of consumer expenditures towards ‘home nesting’ goods and away from certain services that require person-to-person interaction is unlikely to persist. On the other hand, the big digitalisation push that materialised both in the work sphere and personal lives can be expected to have lasting impacts on the composition of demand for products and services and the way those are traded internationally.

The unprecedented heterogeneity of changes in trade flows across products, sources and destinations signifies high uncertainty and adjustment costs, and implies additional incentives for consumers, firms and governments to adopt new — or to intensify existing — risk mitigation strategies. Some firms may want to rethink the resilience and reliability of their supply chains and may decide to try to shorten distances travelled from factories to consumers or internalise larger segments of their value chains within their own corporate structures (e.g. an affiliate supplying a component rather than an external firm). This might contribute to resilience of some supply chains but it might also have negative impacts on productivity and as shown in Arriola (2020^[2]) it may not necessarily boost systemic resilience and stability of the global economy.

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