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Economic Insight

What ship movements reveal about the effects of US tariffs

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We analyzed high-frequency shipping data to identify the effects of US tariffs on trade flows. US imports via the container shipping network have fallen by around 10% in recent weeks. However, they remain at a high level, making a supply chain crunch unlikely. In contrast, US importers are more likely to suffer from a cost shock. Continued high exports from China also point to diversion effects, for example to Europe. Imports by Canadian and Mexican ports have slumped unexpectedly.

We review dramatic media reports on trade slumps

Although the elevated, country-specific rates of the so-called "reciprocal tariffs" have been suspended for 90 days, the US tariffs introduced by Donald Trump are still many times higher than before he took office. Now, the media in the US are at times dramatically reporting on the initial consequences: for example, cargo handling at the important port of Los Angeles fell by 30% at the beginning of May compared with the previous year. Other alarming reports follow suit.

However, many countries only publish reliable trade statistics after a long delay. In order to understand the disruptions in trade and their effects on the economies of the US and China, we have therefore analyzed current container ship movements. These represent an approximation of actual trade flows. However, as these time series fluctuate heavily and are subject to seasonal trends, we compare the data with a hypothetical scenario without tariffs. The comparison with these expected goods flows allows us to make economically meaningful statements and reveals some surprising findings, which we describe below. A full overview of the methods and limitations of the data is provided below (see Box.)

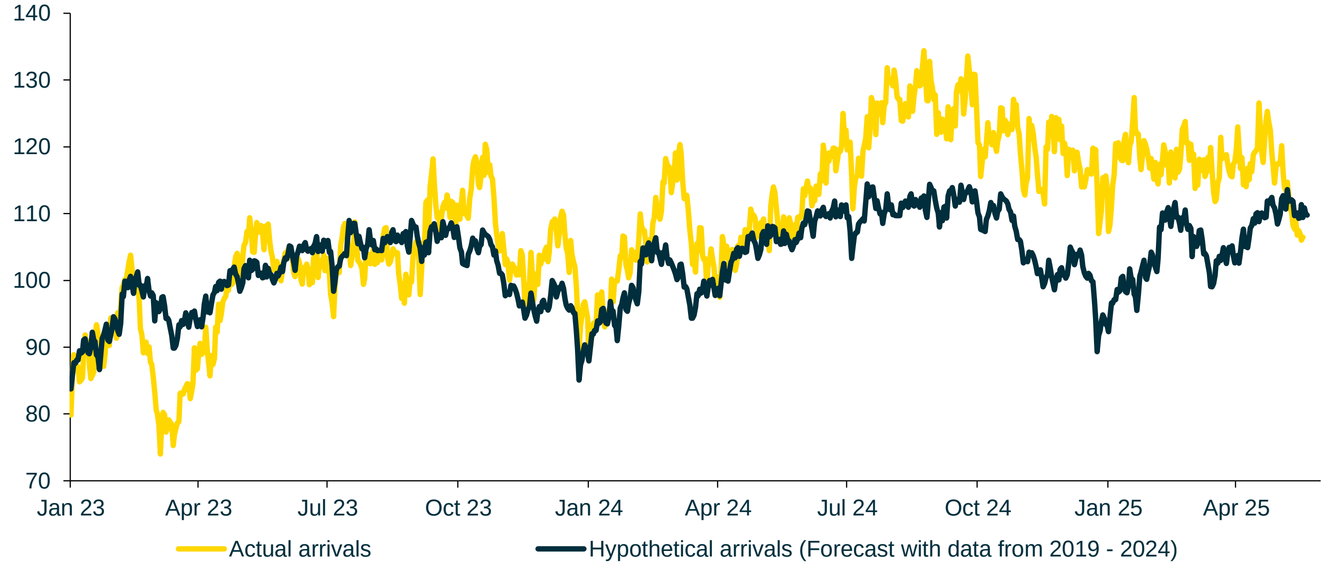
The US supply chains are unlikely to break down

Despite media reports, we have not observed any dramatic slump in the ten largest US ports as of May 16. Compared to April, imports via container ports may have fallen by around 10%. However, this means that current imports are only slightly below the hypothetical level that would have been expected at this time of the year without tariffs. On the contrary, there had been massive pull-forward effects in recent months. This follows from ports recording 10% more throughput than expected in recent months.

This suggests that importers have very likely built up sizeable stocks of critical goods. On the other hand, the US' import levels remain very high, at least via maritime transport. We therefore do not expect US tariffs to cause massive supply chain problems due to lost imports, as was the case during the pandemic. Rather, the data shows that many importers are likely to be forced to pay the tariffs. This will either increase consumer prices in the US in the coming months or reduce corporate profits.

Chart 1 - The imports of the US fall only slightly

Cargo volume extrapolated from container ship arrivals to ten largest US ports using net-draft change. Smoothed daily data and average of 2023 set to 100.



Source: UN Global Platform; IMF PortWatch, Commerzbank-Research

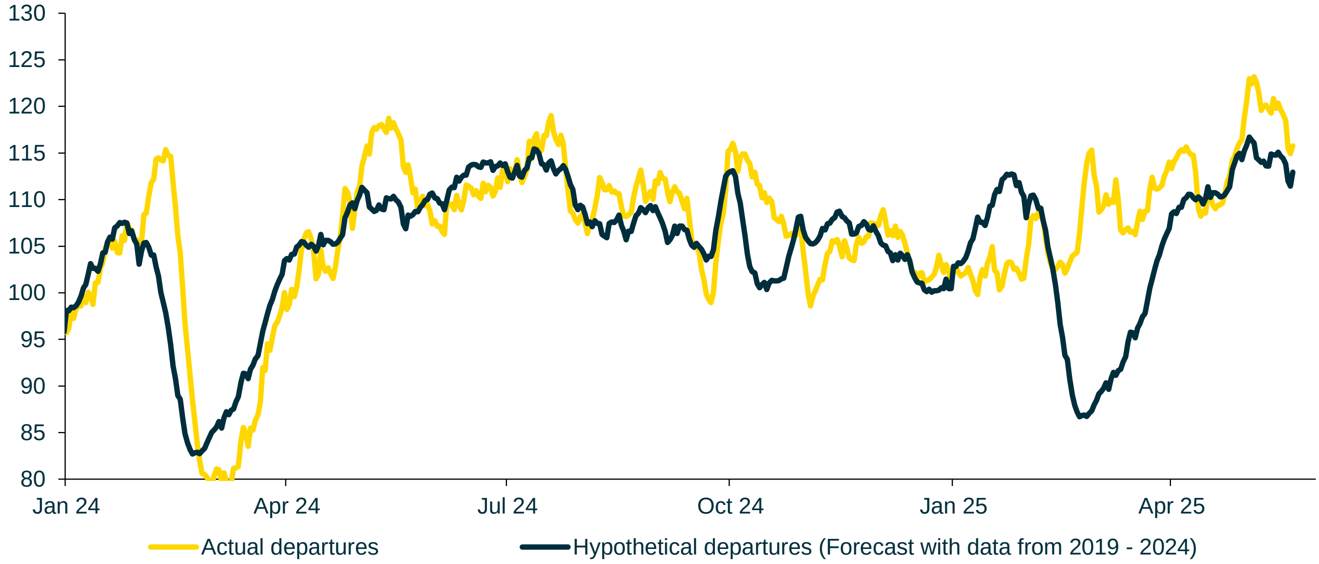
Chinese exports continue to rise

Surprising findings have also emerged for China: container exports from the eight largest ports have actually risen since the beginning of the year. It is particularly striking that there has been no typical slump in exports following the Chinese New Year celebrations this year. Chinese exporters have apparently brought forward the production and export of goods in anticipation of rising tariffs.

However, this reveals a certain discrepancy between the slightly lower imports of the US and the higher exports of China. It seems likely that some of the Chinese goods have been temporarily stored in East Asian countries or even re-declared in order to wait out or circumvent the US tariffs. It is also likely that the first goods have already been diverted to Europe. This is indicated by particularly high activity at the port of Singapore.

Chart 2 - China's exports continue to rise

Cargo volume extrapolated from container ship departures from eight largest ports of China using net-draft change. Smoothed daily data and average of 2023 set to 100.



Source: UN Global Platform; IMF PortWatch, Commerzbank-Research

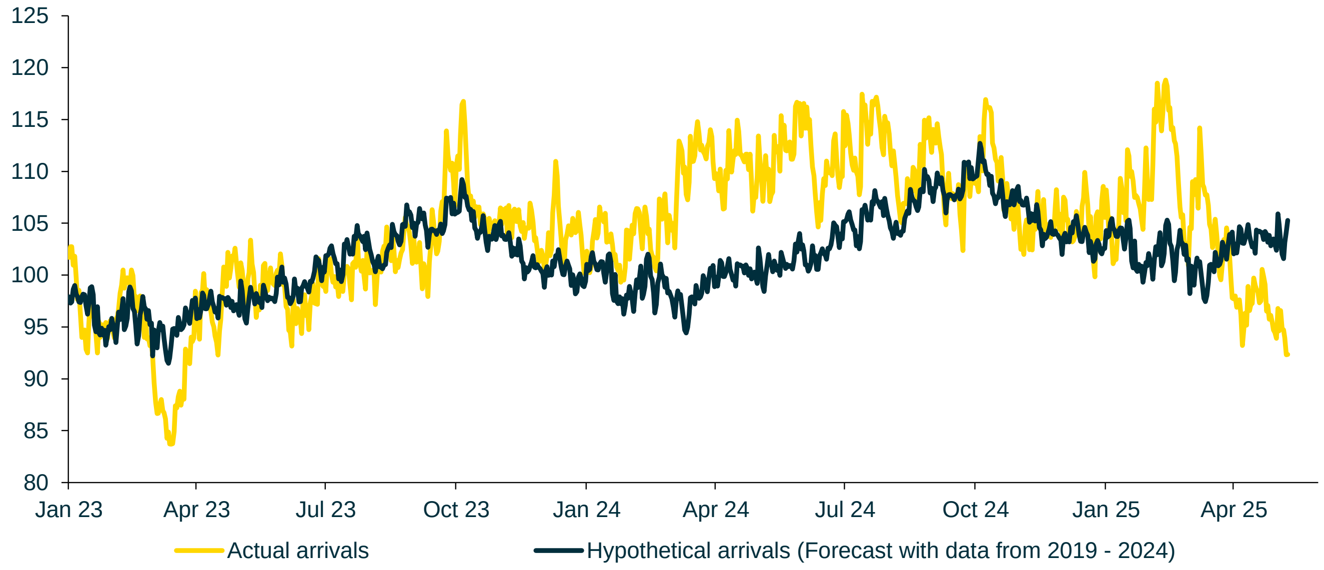
Fentanyl tariffs lead to fewer imports in Canada and Mexico

Almost forgotten are the US tariffs still in place on goods from Canada and Mexico that are not covered by the USMCA free trade agreement. Trump imposed these tariffs in connection with illegal imports of the drug fentanyl, and they are as high as 25%. More than half of the goods flowing from Canada and Mexico last year were not covered by the USMCA. Although companies are now likely to apply for tariff exemptions under the USMCA much more frequently, these tariffs are clearly having an effect.

The major Pacific ports of Canada and Mexico, Vancouver and Manzanillo, are also experiencing a slump in imports. Actual imports in May are already about 15% below expectations. It is highly likely that companies in these countries are currently importing fewer intermediate goods from Asia. Assuming that not all intermediate goods can be replaced by local production, this is likely to result in fewer exports from Canada and Mexico to the US. This applies above all to the manufacturing sector. However, even in this case, the consequences are likely to be less severe than during the supply chain crisis caused by the pandemic.

Chart 3 - Fewer ships arrive to the West Coast ports of Canada and Mexico

Cargo volume extrapolated from container ship arrivals to Vancouver (Canada) and Manzanillo (Mexico) using net-draft change. Smoothed daily data and average of 2023 set to 100.



Source: UN Global Platform; IMF PortWatch, Commerzbank-Research

Box: The importance of container shipping for trade

Container shipping transports roughly half of the international flow of goods in terms of value. Therefore, goods flows on the container ship network are also suitable for approximating the imports and exports of large countries. However, there are differences between individual countries: While goods transported in containers are likely to account for more than half of Chinese exports, the US probably imports only about one-third of its imports via container ships. The other two-thirds are accounted for by air, rail, and road transport, as well as other types of maritime vessels such as tankers and bulkers (cargo ships for transporting bulk goods). In our analysis, we only evaluate container ships, as bulk cargo, with its high mass but low value per kilogram, distorts the data.

Details on the processing of ship data

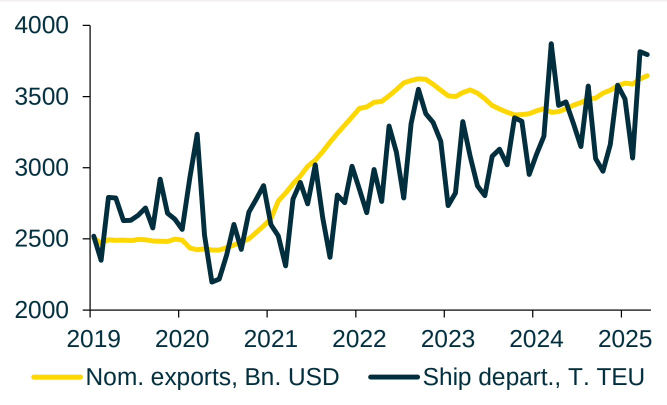
The International Monetary Fund (IMF), in collaboration with Oxford University, provides daily data on goods flows to and from seaports on its PortWatch platform. The IMF estimates the flow of goods based on the change in the draft of ships between entering and leaving the port area. If individual ports (such as the port of Los Angeles) publish information on throughput figures, we supplement the IMF's raw data with trends in throughput figures. We then summarize the flow of goods by region using the following seaports:

- **China:** Shanghai, Ningbo, Tianjin Xin Gang, Shenzhen, Qingdao, Guangzhou, Yantian, Xiamen
- **South Korea:** Gwangyang, Busan, Ulsan, Incheon
- **Japan:** Tokyo, Nagoya Aichi, Yokohama, Kobe
- **USA:** New York-New Jersey, Savannah, Port of Virginia, Baltimore, Los Angeles-Long Beach, Oakland, Tacoma, Houston, New Orleans
- **Eurozone:** Wilhelmshaven, Bremen, Bremerhaven, Hamburg, Rotterdam, Amsterdam, Ijmuiden, Antwerp, Le Havre, Algeciras, Valencia, Barcelona, Genoa, Gioia Tauro

These seaports reflect the largest seaports in each region. We have deliberately excluded smaller ports, as these mainly serve traffic within the respective countries. Instead, we are focusing specifically on international trade. Despite these precautions, our data still only represent an approximation of exports and imports. Charts 4 and 5 show that ship cargo does, however, reflect the general trend. However, even sharp fluctuations in shiping data are not interpretable as changes of actual trade flows.

Chart 4 - CN exports lead ship depart.

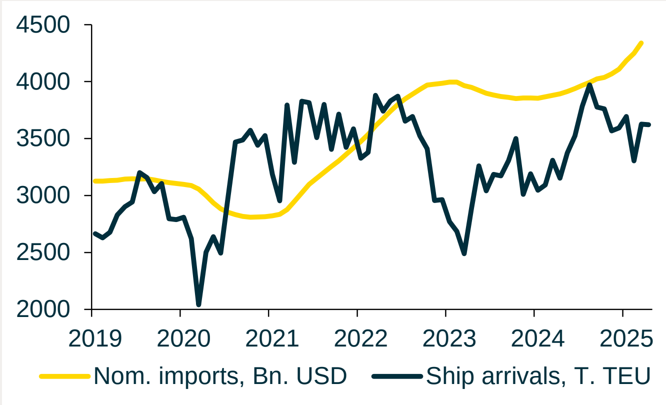
Annualized Chinese nominal exports in Bn. USD and container ship departures from eight major Chinese shipping ports in T. TEU



Source: Bloomberg, PortWatch by IMF & Oxford University, Commerzbank-Research

Chart 5 - US imports trail ship arrivals

Annualized nominal exports by USA in billion USD and container ship arrivals to ten major shipping ports in thousand TEU



Source: Bloomberg, PortWatch by IMF & Oxford University, Commerzbank-Research

Calculation of the hypothetical trend

First, we smooth the daily ship data using a Hodrick-Prescott filter to isolate the trend and reduce the influence of outliers. To calculate the trade flows without the influence of US tariffs – the hypothetical trend – we calculate the average of the last few years for each calendar day of the year. For the value on May 22, for example, we calculate the average of the values for May 22 in 2019, 2022, 2023, and 2024 (i.e., for years without a significant impact of the pandemic on supply chains). We multiply this average by the annual growth between 2019 and 2024 to find the hypothetical value for May 22, 2025.

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