

Matthes, Jürgen

Research Report

Yuan undervaluation against the Euro: Unfair cost advantages for China?! Evidence for Germany and the Euro area

IW-Report, No. 36/2025

Provided in Cooperation with:

German Economic Institute (IW), Cologne

Suggested Citation: Matthes, Jürgen (2025) : Yuan undervaluation against the Euro: Unfair cost advantages for China?! Evidence for Germany and the Euro area, IW-Report, No. 36/2025, Institut der deutschen Wirtschaft (IW), Köln

This Version is available at:

<https://hdl.handle.net/10419/323227>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Yuan Undervaluation against the Euro: Unfair Cost Advantages for China?!

Evidence for Germany and the Euro area

Jürgen Matthes

Cologne, 23.07.2025

IW-Report 36/2025

Wirtschaftliche Untersuchungen,
Berichte und Sachverhalte

**Institut der deutschen Wirtschaft Köln e. V.**

Postbox 10 19 42
D-50459 Cologne

The German Economic Institute (IW) is a private economic research institute in Germany, which is an advocate of a liberal economic and social order. Our task is to improve understanding of economic and social interrelationships.

IW on social media

x.com
[@iw_koeln](#)

LinkedIn
[@Institut der deutschen Wirtschaft](#)

Instagram
[@IW_Koeln](#)

Author**Jürgen Matthes**

Head of International Economic Policy,
Financial and Real Estate Markets
matthes@iwkoeln.de
+49 221 – 4981-754

All studies can be found at www.iwkoeln.de

The grammatical gender (male) is regularly used in this publication for the sake of brevity. It explicitly refers to all gender identities.

As of:

July 2025

Contents

Summary	3
1 Introduction	4
2 Higher Trade Deficits and Lower Real Yuan Exchange Rate	4
2.1 Trade deficits	4
2.2 Nominal Yuan exchange rate.....	6
2.3 Diverging producer prices	6
2.4 Real Yuan exchange rate	9
2.5 Interim conclusion: real Yuan depreciation and rising trade deficit in parallel	10
3 Evidence for Exchange Rate Manipulation?!	12
3.1 Conceptual deliberations	12
3.2 Estimating net demand for Yuan on the exchange rate market	14
4 Conclusion	18
Figures.....	20
References.....	21

Summary

Compared to 2020, the deficit in merchandise goods trade with China is 3.6 times higher for Germany in 2025 (annualised based on data from January to April 2025) and it has doubled for the Euro area. However, the nominal exchange rate of the Yuan against the Euro has hardly changed between 2020 and 2025. This is all the more striking as European goods have become much more expensive: Producer prices have risen by more than 35 per cent in Germany and the Euro area compared with early 2020, whereas Chinese producer prices have hardly increased at all. The immense producer price divergence is mostly due to an external shock in Europe that resulted from supply chain restrictions in the course of the COVID-19-pandemic and from the energy cost increases after the Russian invasion of Ukraine.

This constellation has caused a very large *real* appreciation (based on producer prices) of the Euro against the Yuan of more than 40 per cent for Germany and for the Euro area between early 2020 and spring 2025. The resulting huge cost disadvantage has likely contributed considerably to the rise in the trade deficit as an appreciation of the Euro renders European exports more expensive and imports from China less costly. Moreover, the real appreciation appears to be an important reason why about half of German industrial firms facing Chinese competition reported in 2024 that Chinese competitors undercut their prices by more than 30 per cent (Matthes, 2024). This large European cost disadvantage would have been prevented if the Yuan had appreciated against the Euro to a significant degree. In fact, a rising trade deficit leads to higher net-demand for Yuan in Euro on the exchange rate market as European importers sell Euro to obtain Yuan in order to buy goods from Chinese sellers. Thus, the Yuan should have appreciated if it was floating freely. However, the Yuan exchange rate is managed by the central bank of China relative to the US Dollar and to a basket of other currencies. As the Yuan did not appreciate against the Euro, the question arises whether this is a case of currency manipulation and whether China's significant cost advantage can be deemed unfair.

To investigate this question, also other components of the bilateral balance of payments between the Euro area and China have to be taken into consideration as they also influence the net demand for Yuan in Euro. Indeed, the balances in services trade and in primary incomes (other components of the current account apart from the balance in merchandise goods trade) are positive. Thus, these components reduce the net demand for Yuan in Euro that is caused by the negative goods trade balance, but only to a small degree. Moreover, also capital flows have to be considered (that are measured in the financial account balance). However, there is a lack of data for portfolio investment inflows from China to the Euro area so that total capital inflows cannot be calculated. However, this missing component can be estimated (Chapter 3.2). Based on this estimation, the overall change in the net demand for Yuan in Euro between 2020 and 2024 can also be estimated: it has significantly risen by EUR 125 billion.

These findings provide strong indications for currency manipulation and for a significant and unfair undervaluation of the Yuan against the Euro. If there had been a free and market-based bilateral exchange rate market, the rising net demand for Yuan in recent years should have led to a significant appreciation of the Yuan against the Euro. As this was prevented by the central bank of China's currency management policies, a considerable unfair price advantage for China has resulted, which comes at the expense of European companies that compete with Chinese firms on the world market. The large increase in the merchandise trade deficit with China is a clear indication of the relevance of the Yuan's undervaluation against the Euro. As European industry is seriously threatened by this development, trade policy action is urgently warranted in order to re-establish a level playing field.

1 Introduction

The exchange rate between the Chinese Yuan and the Euro is hardly a topic in public debate – despite the fact that it can strongly influence the cost of imports and exports in trade with China. A low exchange rate of the Yuan against the Euro renders imports from China cheaper and makes German exports to China more expensive – thus potentially leading to a higher trade deficit. Since the German trade deficit with China has risen sharply since 2020, the question arises whether exchange rate developments play a role.

The exchange rate issue also arises from another perspective. German businesses have seen a significant increase in competitive pressure from Chinese companies. First, this is evidenced by relatively large losses in the EU import share of sophisticated industrial goods for Germany over time, alongside parallel increases for China. Both Germany's losses and China's gains were exceptionally high during the two-year period from 2020 to 2022 compared to the previous five-year periods (Matthes, 2023). Second, an IW firm survey from early summer 2024 provides further evidence (Matthes, 2024a). Accordingly, about half of the German industrial firms facing competition from China in their sales markets report that Chinese competitors undercut their prices by more than 30 per cent. Also, around half of the firms with Chinese competition foresee production cuts and layoffs as a consequence of competition from China. Here, a low Yuan exchange rate could also play a role, as it would enhance the price competitiveness of Chinese suppliers.

Against this background, this IW report analyses how the trade balance deficit with China has developed and how the exchange rate of the Yuan against the Euro has changed in nominal and real terms since 2020 (Chapter 2). Chapter 3 discusses whether there is evidence of an undervaluation of the Yuan against the Euro and of potential currency manipulation by China. The analysis is carried out for Germany and the Euro area, as the latter is the appropriate economic reference area to make an assessment concerning the Euro.

2 Higher Trade Deficits and Lower Real Yuan Exchange Rate

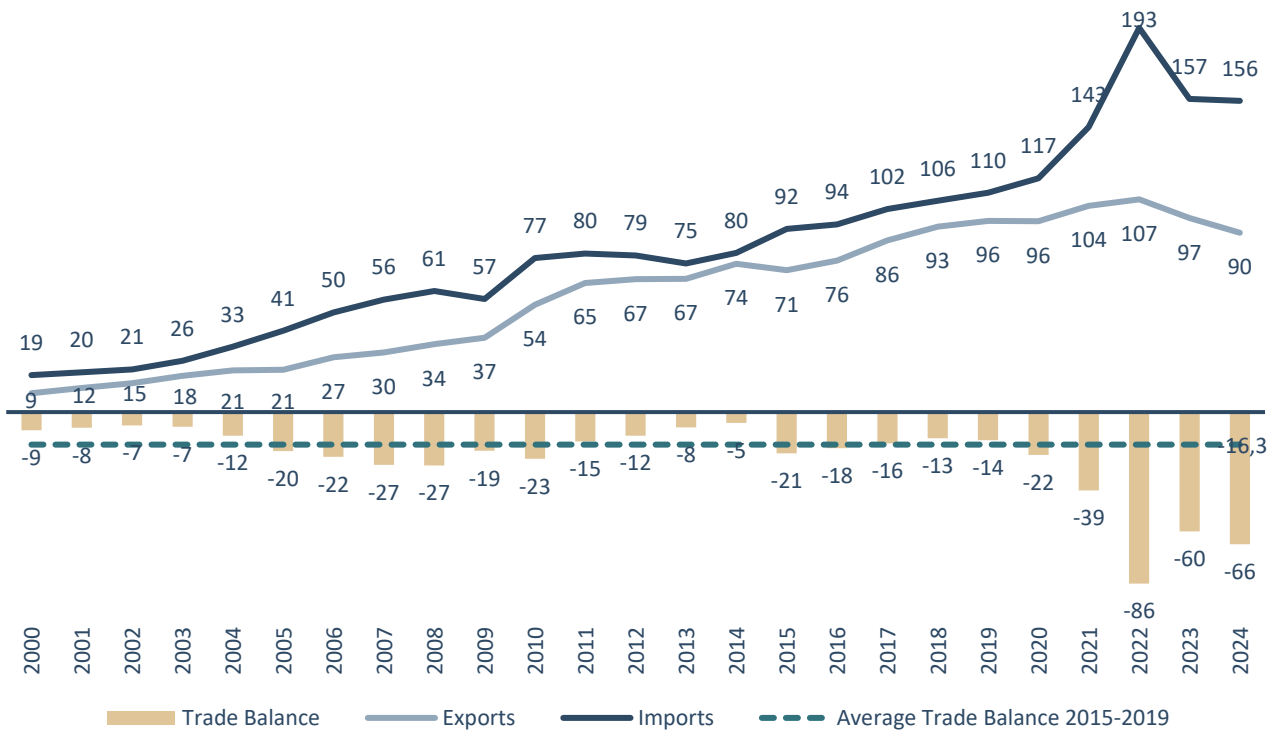
2.1 Trade deficits

Beginning in 2020, but mainly in the following years, the deficit in merchandise trade with China has increased significantly for Germany (Figure 2-1a) and the Euro area (Figure 2-1b). The particularly high deficit in 2022 can largely be explained by an extraordinary and mainly one-off effect, before all a major rise in imports from China in a single chemical product group and likely warehousing purchases of Chinese goods, particularly of electronic goods that had previously suffered from semiconductor shortages (Matthes, 2024b). However, a comparison of the trade deficits between 2024 and the period before 2020 is not influenced by such distortions and provides a relatively sound picture.

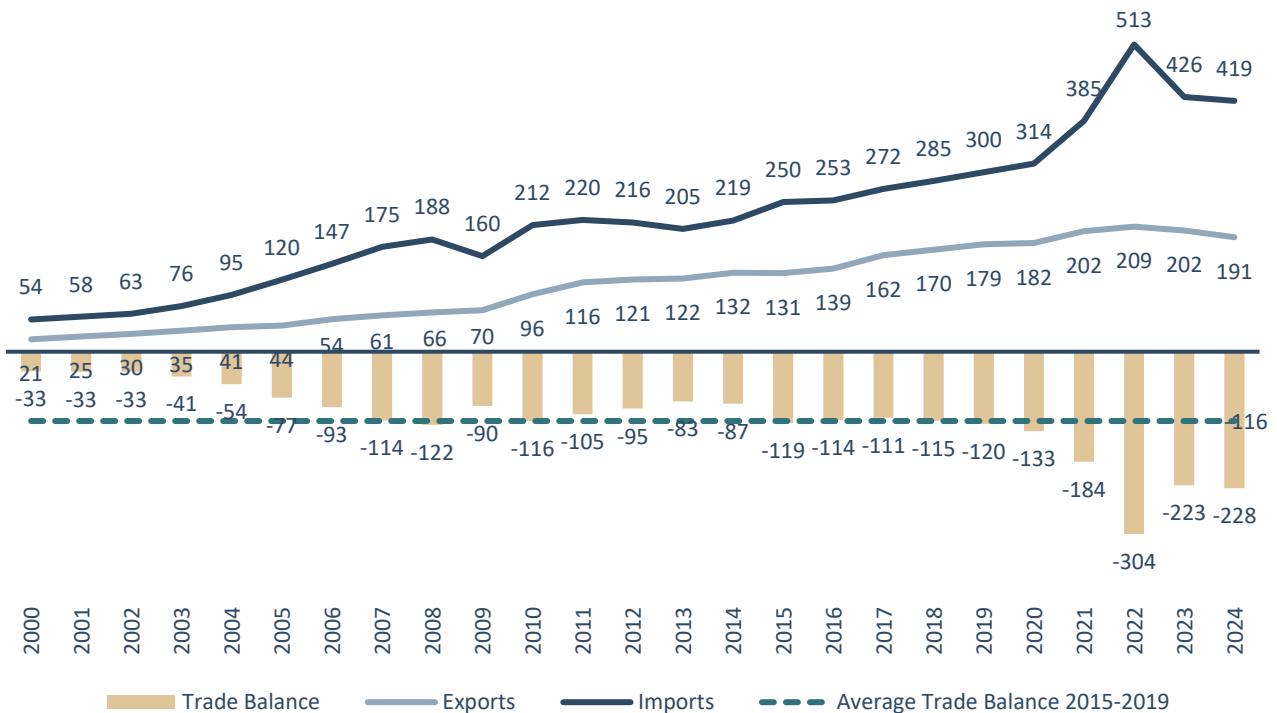
- In 2024, the **German** merchandise trade deficit with China amounted to €66 billion and was thus more than 4 times higher than the trade deficit average between 2010 and 2019 (€14.5 billion) or the average between 2015 and 2019 (€16.3 billion).
- In 2024, the **Euro area** had a merchandise trade deficit with China of €228 billion, which was about double compared to the trade deficit averages between 2010 and 2019 (€106 billion) and 2015 and 2019 (€116 billion).

Figures 2-1a and 2-1b: Merchandise Trade of Germany and the Euro area with China

a) Germany – China Merchandise Trade, Data in EUR billions



b) Euro area – China Merchandise Trade, Data in EUR billions



Sources: Statistisches Bundesamt; Eurostat; German Economic Institute

2.2 Nominal Yuan exchange rate

Against this background, it is interesting to look at the development of the nominal Yuan exchange rate against the Euro. Figure 2-2a depicts the monthly exchange rates between January 2020 and May 2025 and allows several conclusions: the Yuan appreciated somewhat during the two years between the summer of 2020 and the summer of 2022, thereafter it tended to depreciate again. After a relatively large devaluation step in 2025, the current level in May 2025 was nearly as low as the minimum in July 2020. Overall, the Yuan has fluctuated within a relatively narrow band during the depicted period. The minimum (EUR 0.1220/CNY) of the monthly exchange rates is less than 17 per cent lower than the maximum (EUR 0.1469/CNY).

As the data for many other indicators used in this report's analysis (particularly concerning Chapter 3) is on a yearly basis, Figure 2-2b depicts the yearly exchange rate averages. Based on this metric, the Yuan appreciated against the Euro by about 11 per cent between 2020 and 2022 before it depreciated again to reach basically the same level as in 2020.

At first sight, this development does not raise concerns, as there has been no nominal depreciation between 2020 and today. Moreover, the Yuan appreciated to a moderate degree between 2020 and 2022, during which the trade deficit rose to a new maximum in 2022 in Germany and the Euro area. This was to be expected, as higher (net) imports raise the demand for Yuan in Euro in a bilateral foreign exchange view.

2.3 Diverging producer prices

While the nominal Yuan exchange rate development, when taken at face value, did not draw any larger attention in the public debate in Europe, behind the scenes there were massive shifts in costs and prices in Germany and the Euro area that have to be taken into account when evaluating whether the Yuan exchange rate might be "too" low.

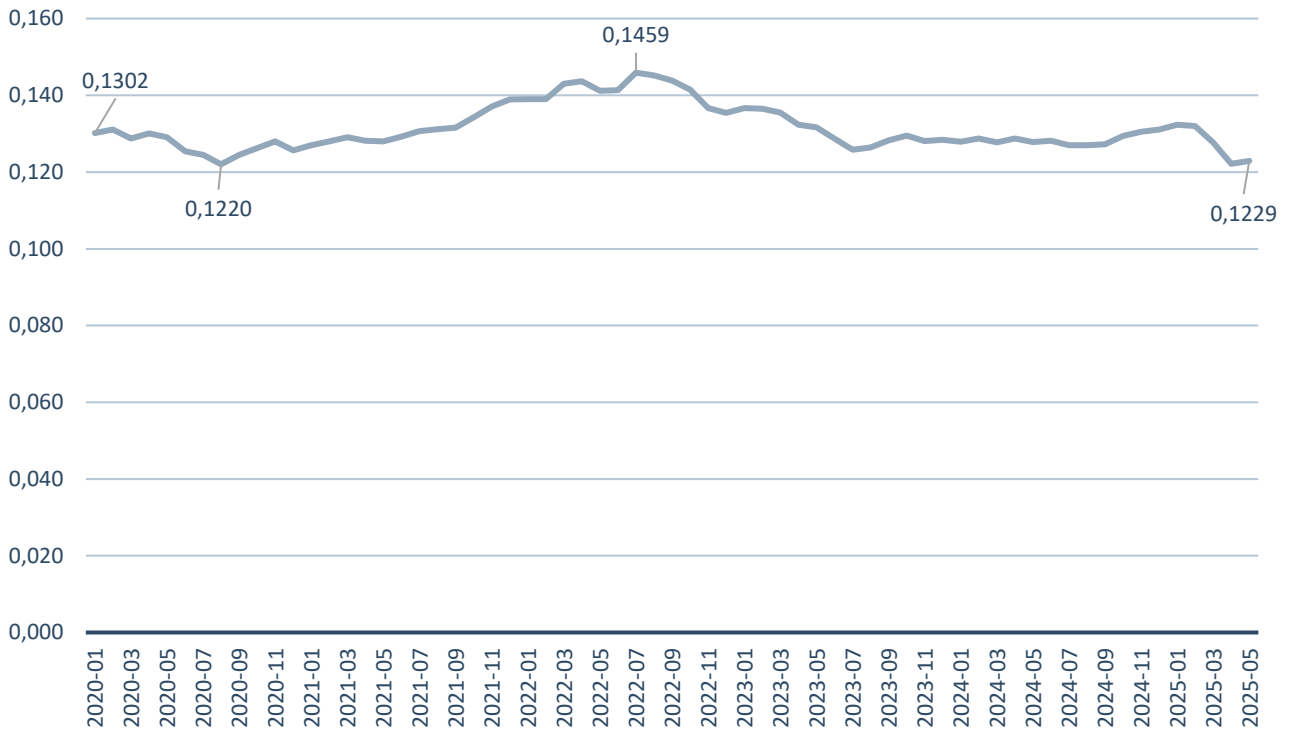
In the course of the COVID-19 pandemic, European firms' supply chains were under immense stress, as lockdowns (also seen in China) and severe problems in international logistics lowered production more than demand. When supply chain restrictions were slowly retreating, the energy crises arose in Europe after the Russian invasion of Ukraine. This constellation of events led to a large increase in prices in the Euro area and a bout of inflation. Also, producer prices rose considerably as firms tried to roll over higher input costs to their customers. Producer prices generally measure prices of industrial goods, certain services and raw materials that are produced by domestic firms and sold on the domestic market.

While some firms might have been able to roll over their increased input costs in full (or even more), thus rendering profit margins largely unaffected (or even rising), other firms are likely to have suffered from lower profit margins as their ability to roll over was more limited. Notwithstanding this differentiation, higher producer prices of firms supplying input goods imply higher costs for other firms that purchase these inputs.

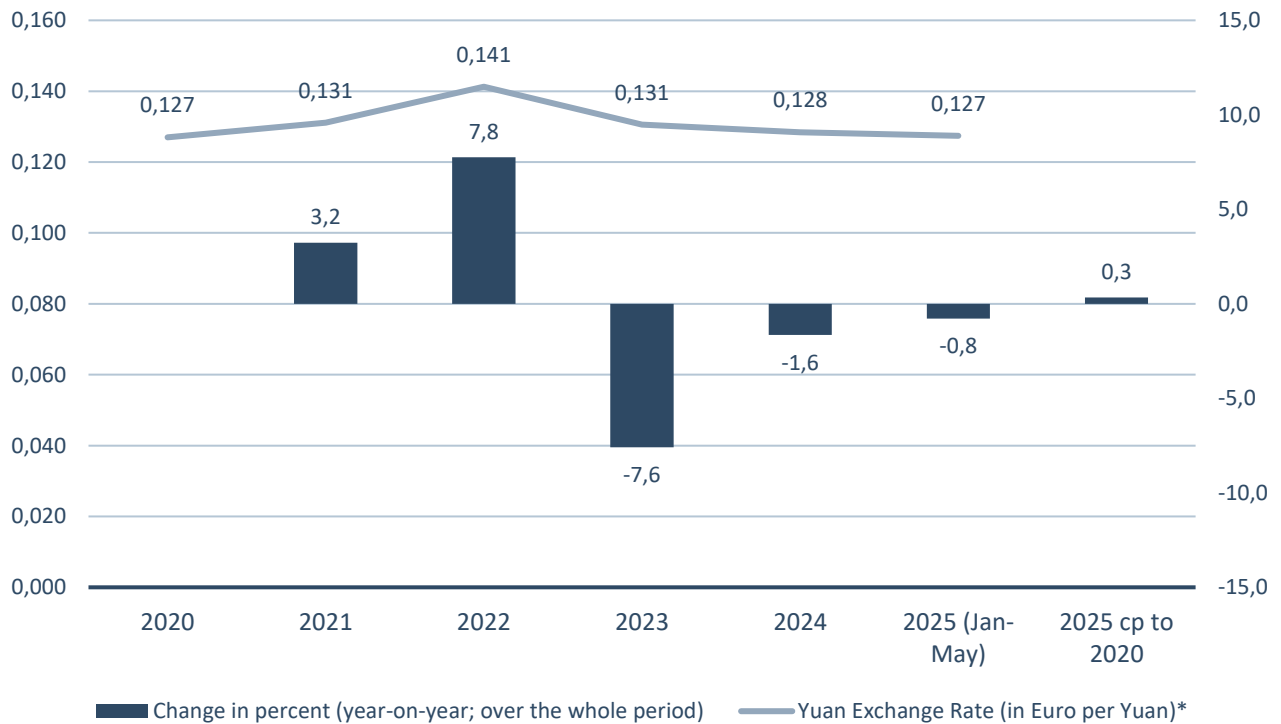
Thus, producer prices can be taken as one possible measure of international price competitiveness, particularly if exchange rates do not change (as was shown above when comparing 2020 to 2025). This approach is further justified as researchers from the European Central Bank (Haschimi et al., 2024) also employ it. They compare the relative producer price development between the Euro area and China and also calculate real bilateral exchange rates based on the development of relative producer prices (see Chapter 2-4).

Figures 2-2a and 2-2b: Yuan Exchange Rate against the Euro

a) Yuan Exchange Rate (in Euro per Yuan) based on monthly data



b) Yuan Exchange Rate (in Euro per Yuan) based on yearly Data and Changes to previous Year



*Yearly average of daily exchange rate.

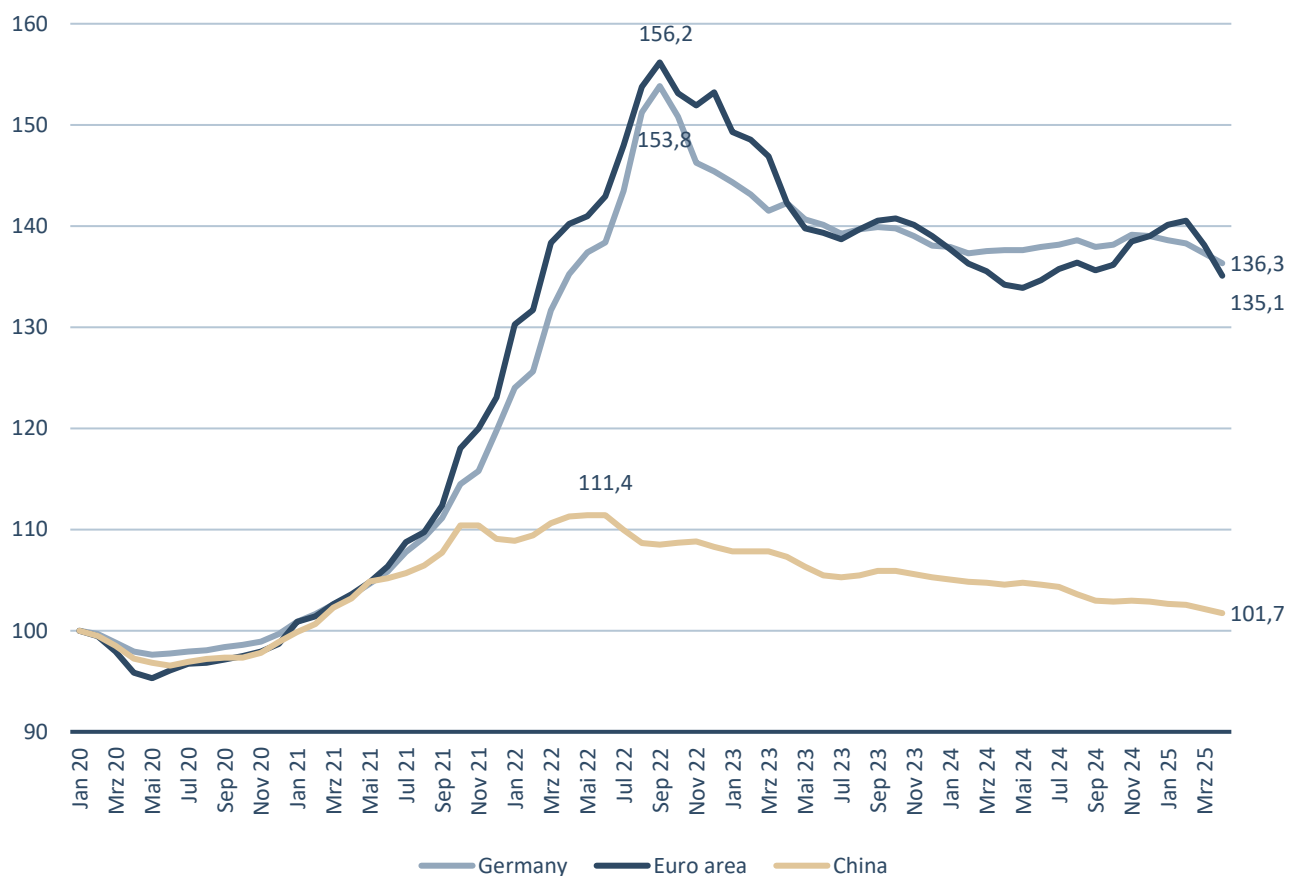
Sources: Deutsche Bundesbank; German Economic Institute

For the following analysis, this report uses standard producer price indices (PPIs) provided by Macrobond (generally rebased to 2011). For Germany, the PPI corresponds closely to the data published by the German Statistical Office (Erzeugerpreisindex gewerblicher Produkte). For the Euro Area, Macrobond uses PPIs provided by Eurostat. For China, the PPI provided by Macrobond is taken from the National Bureau of Statistics in China and also closely fits the PPI development published in media reports and other sources.

Figure 2-3 shows the development of monthly PPIs in Germany, the Euro area and China. At first glance, a striking difference is obvious. After a small decline in 2020, PPIs in Germany and the Euro area rose by more than 50 per cent between early 2021 and autumn 2022, before falling somewhat to reach the current level which is still a good 35 per cent higher than the PPI-index in January 2020. Conversely, China's PPI rose much less (by 11 per cent at its maximum) and after a relatively continuous producer price deflation is now only less than 2 per cent higher in April 2025 compared to January 2020.

Figure 2-3: Diverging Producer Price Developments in Europe and China

Producer Price Indices Index January 2020=100



Sources: Macrobond; German Economic Institute

2.4 Real Yuan exchange rate

The sharp and persistent increase of producer prices in Germany and the Euro area led to a significant price advantage for China or, vice versa, a significant price disadvantage for Germany and the Euro area. To measure the extent of this cost divergence, the relative PPI developments can be calculated for the period from January 2020 to April 2025. This can be done from different perspectives – rendering somewhat different results due to basic mathematics.

Figure 2-4 shows:

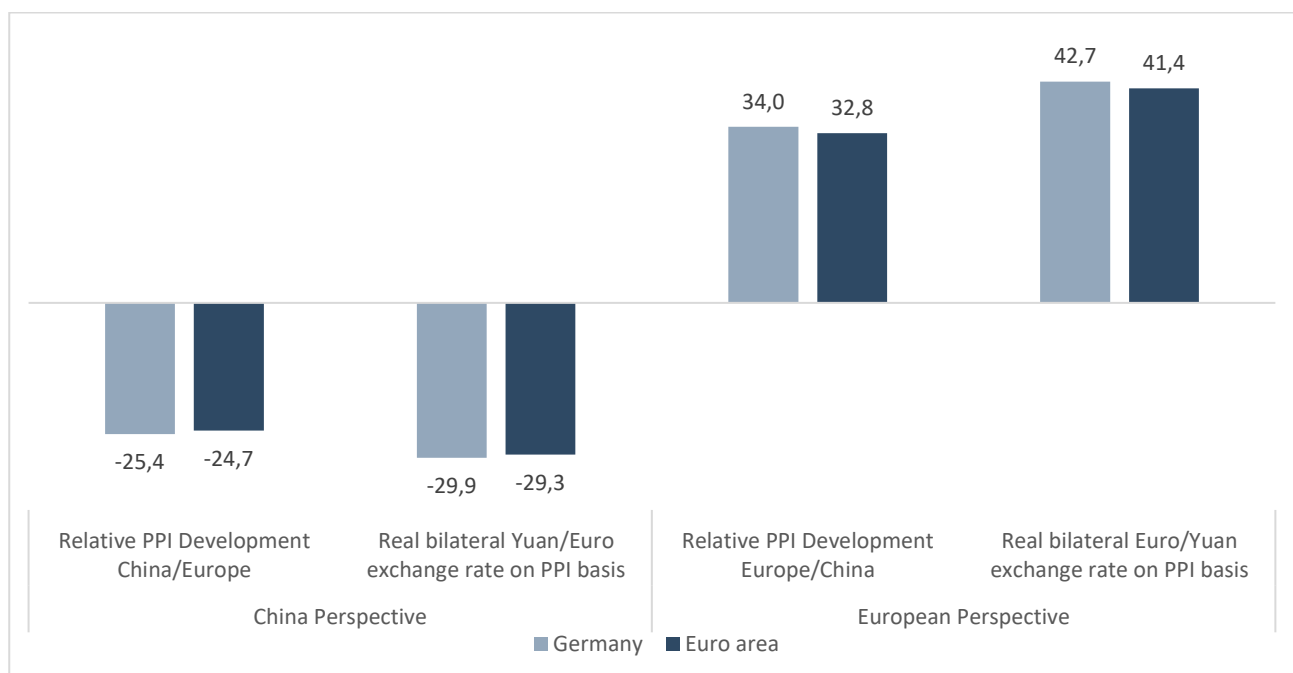
- From the Chinese perspective, Chinese goods became cheaper by about 25 per cent relative to European goods based on the relative PPI developments.
- From the European perspective, goods from Germany and the Euro area became more expensive by about a third relative to Chinese goods.

Based on the relative PPI developments, the change in the real bilateral exchange rate can be calculated for the period between January 2020 and April 2025 – also from both perspectives.

- Chinese perspective: As the nominal exchange rate of the Yuan against the Euro depreciated slightly (by nearly 6 per cent) in this period (Figure 2.2a), the real bilateral Yuan exchange rate depreciation based on PPIs is slightly larger than the decline measured by the relative PPI development from the Chinese perspective. The bilateral real Yuan/Euro exchange rate (on a PPI basis) depreciated significantly by nearly 30 per cent in the period covered here.
- European perspective: As the Euro appreciated slightly against the Yuan, the bilateral real Euro/Yuan exchange rate based on PPIs rose more than the relative PPI development. The increase of about 42 per cent is very large for such a short period.

Figure 2-4: Relative PPI Development and Change in Real bilateral Exchange Rate: Different Perspectives

Change between January 2020 and April 2025 in per cent



Sources: Macrobond; Deutsche Bundesbank; German Economic Institute

The concept of the real exchange rate between two currencies can also be explained in another way, as the following examples illustrate. If the nominal exchange rate of Country A appreciates by 10 per cent against Country B, exports from Country A to Country B become, *ceteris paribus*, 10 per cent more expensive measured in Currency B. An identical effect will result if the exchange rate remains constant and the production costs rise by 10 per cent in Country A. This is termed a real appreciation and has the same effect on the real economy as a nominal exchange rate appreciation of the same size. In such a situation, a depreciation of the exchange rate of Country A by 10 per cent would eliminate the rise in production costs when measured in Currency B.

In the current case depicted here, as the Yuan/Euro exchange rate hardly changed, there has been a significant real appreciation of the Euro because producer prices have risen far more in Germany and the Euro area compared to China. A depreciation of the Euro, or respectively, an appreciation of the Yuan could have mitigated this effect.

In conclusion, the PPI divergence between Europe and China was immense and is still relevant. However, the Yuan did not appreciate against the Euro when 2020 or 2021 is compared to today. This constellation of events has led to a massive cost disadvantage for Germany and the Euro area vis-à-vis China.

2.5 Interim conclusion: real Yuan depreciation and rising trade deficit in parallel

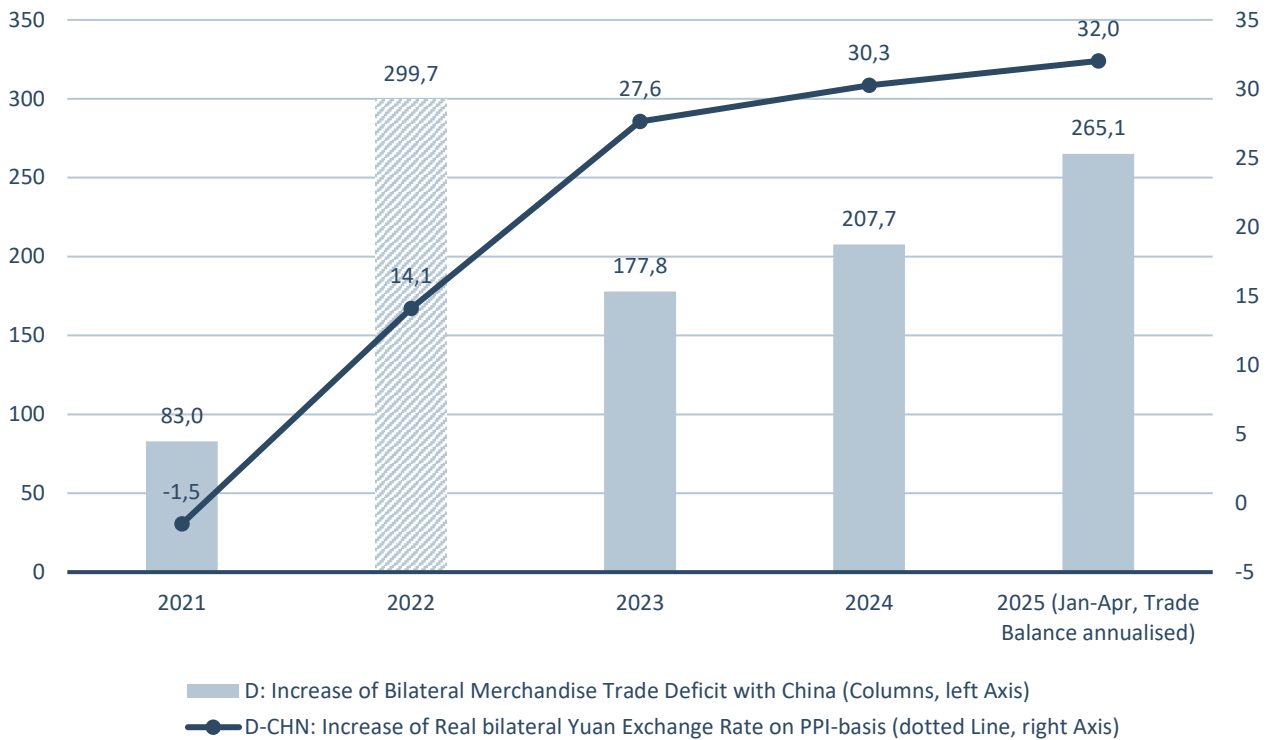
This cost disadvantage appears to be highly relevant in economic terms. This is shown by Figure 2-5a and Figure 2-5b, which compare the development of the real bilateral exchange rates and the development of the merchandise trade deficit with China for Germany and the Euro area. The parallelism of the rise in the real bilateral Euro/Yuan exchange rate and of the increase in the trade deficits is striking (taking into account that trade data for 2022 is distorted (see subnote in Figure 2-5)).

The question arises whether there could be a causal link between these developments and, if so, in which direction such a link works. While econometric estimations to analyse this question are beyond the scope of this report, theoretical deliberations can help. From a theoretical point of view, a causal link is likely only in one direction. Rising cost disadvantages are likely to cause a rising trade deficit, but not vice versa:

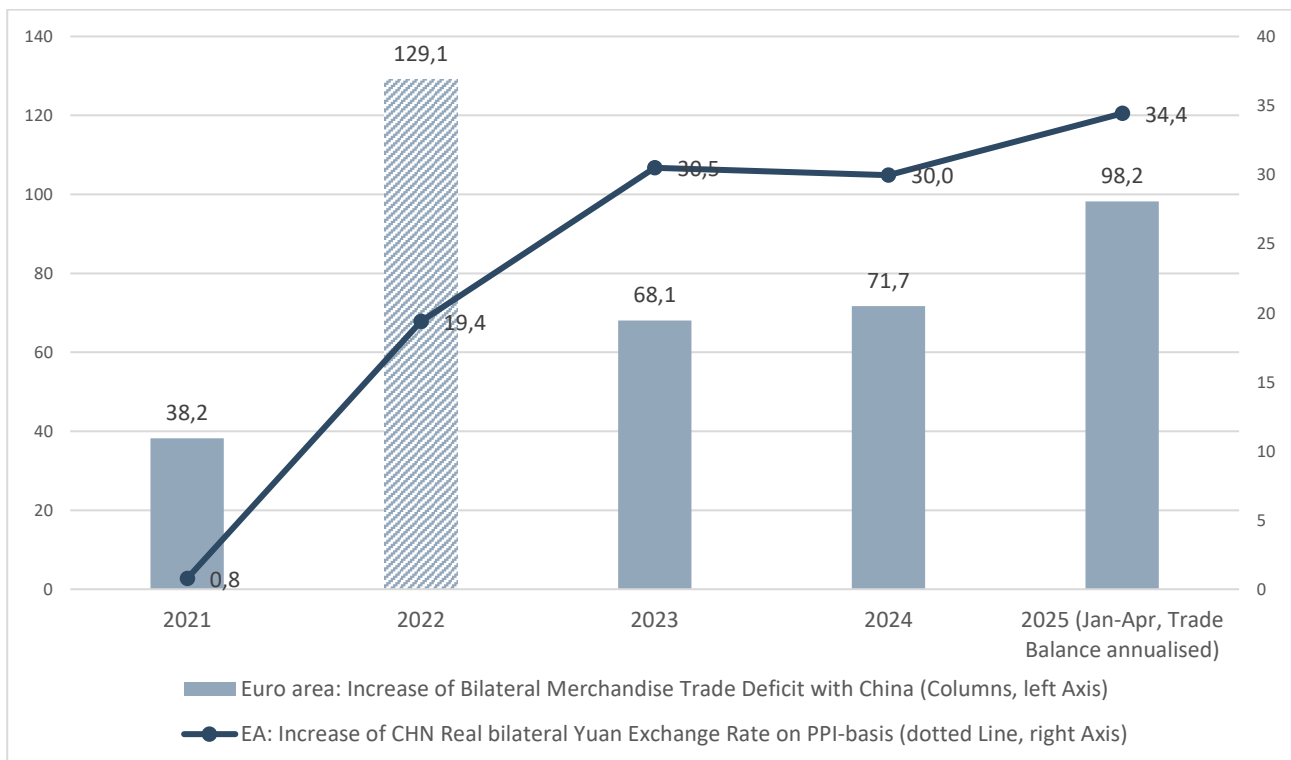
- Higher costs in Europe compared to China tend to increase the relative demand for Chinese goods (leading to higher imports) in Europe and a decrease Chinese demand for European goods (leading to lower exports). Both effects increase the bilateral trade deficit.
- Conversely, if the trade deficit rises, the real Euro/Yuan exchange rate would tend to devalue – and not appreciate as it did in reality. In fact, both components of the real exchange rate should move in the direction of a real devaluation: first, the nominal exchange rate of the Euro should devalue as a rising trade deficit decreases the net demand for Euro, *ceteris paribus*, because fewer European goods are bought by China and more Chinese goods by Europe (implying a higher demand for Yuan in Euro). Second, European production cost disadvantages should also decline, as a rising trade deficit implies less demand for domestic goods from abroad which would decrease price and cost pressures domestically.

Figures 2-5a and 2-5b: Development of Real bilateral Exchange Rate and Trade Deficit with China

a) Germany, Change compared to 2020 in per cent



b) Euro area, Change compared to 2020 in per cent



Shaded column for the trade deficits in 2022 largely due to special one-off effects (see Chapter 2.1)

Sources: Statistisches Bundesamt; Eurostat; Macrobond; Deutsche Bundesbank; German Economic Institute

In sum, the increase in domestic costs in Europe was very large relative to China, mainly as a result of an external shock resulting from supply chain restrictions and energy cost increases after the Russian invasion of Ukraine. This led to a large and persistent cost advantage for China. However, China's nominal exchange rate against the Euro hardly reacted to this major shift. Thus, the question arises whether this lack of reaction in the bilateral nominal exchange rate can be deemed currency manipulation and thus whether China's significant cost advantage can be deemed unfair.

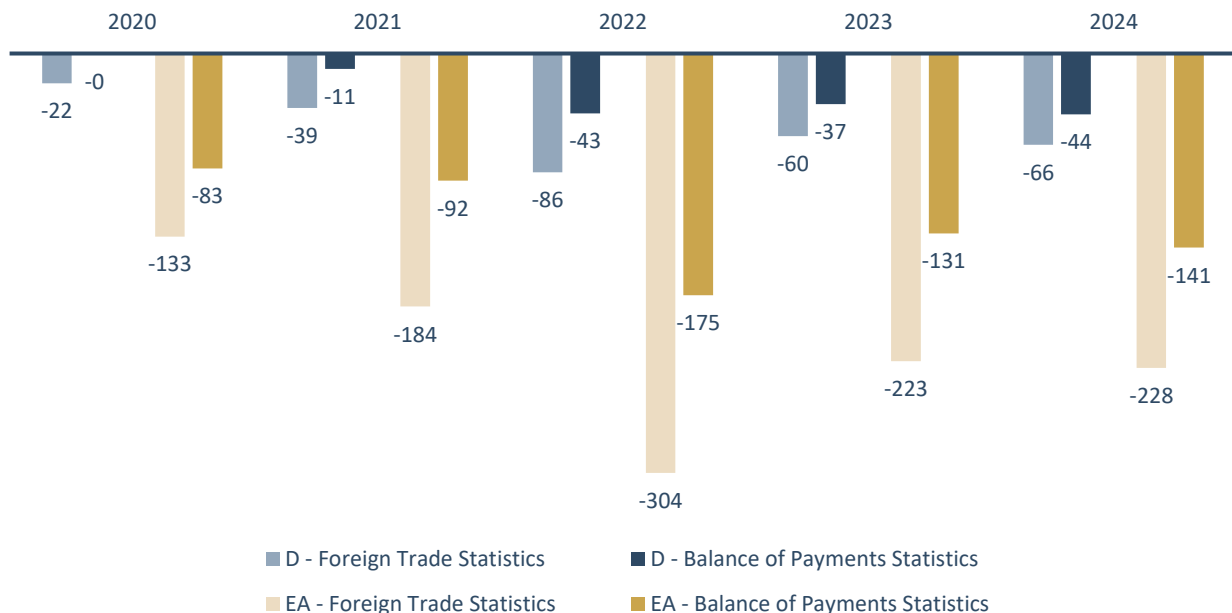
3 Evidence for Exchange Rate Manipulation?!

3.1 Conceptual deliberations

The Yuan exchange rate is not determined freely on the exchange rate market, but is managed by China's central bank relative to a basket of other currencies and particularly in relation to the US Dollar in a relatively opaque manner (IMF, 2024). However, a free and market-based exchange rate market is the benchmark against which the claim of potential currency manipulation has to be evaluated. On a free exchange rate market, the value of the currency of Country A (against the currency of Country B) is determined by supply and demand conditions. The supply and demand of Currency A is mainly determined by the financial flows that derive from the economic transactions between the two countries. These transactions are measured by the bilateral balance of payments statistics.

Figure 3-1: Differing data for the Merchandise Trade Balance from different Statistical Sources

Comparison of the Merchandise Trade Balance between Foreign Trade Statistics and Balance of Payments Statistics
Data in EUR billions



Sources: Deutsche Bundesbank; ECB; German Economic Institute

As already explained, a rising deficit of merchandise trade with China in Europe implies more net imports and thus an increasing demand for Yuan (in Euro), as the European buyers of Chinese goods have to pay for the increased imports in Euro and as the Chinese sellers eventually receive the payment in Yuan. Whether such

a payment is invoiced in US Dollars (or another currency) does not matter in general, as the invoice currency is netted out in the course of the payment process, as it is first bought in Euros and then sold again for Yuan.

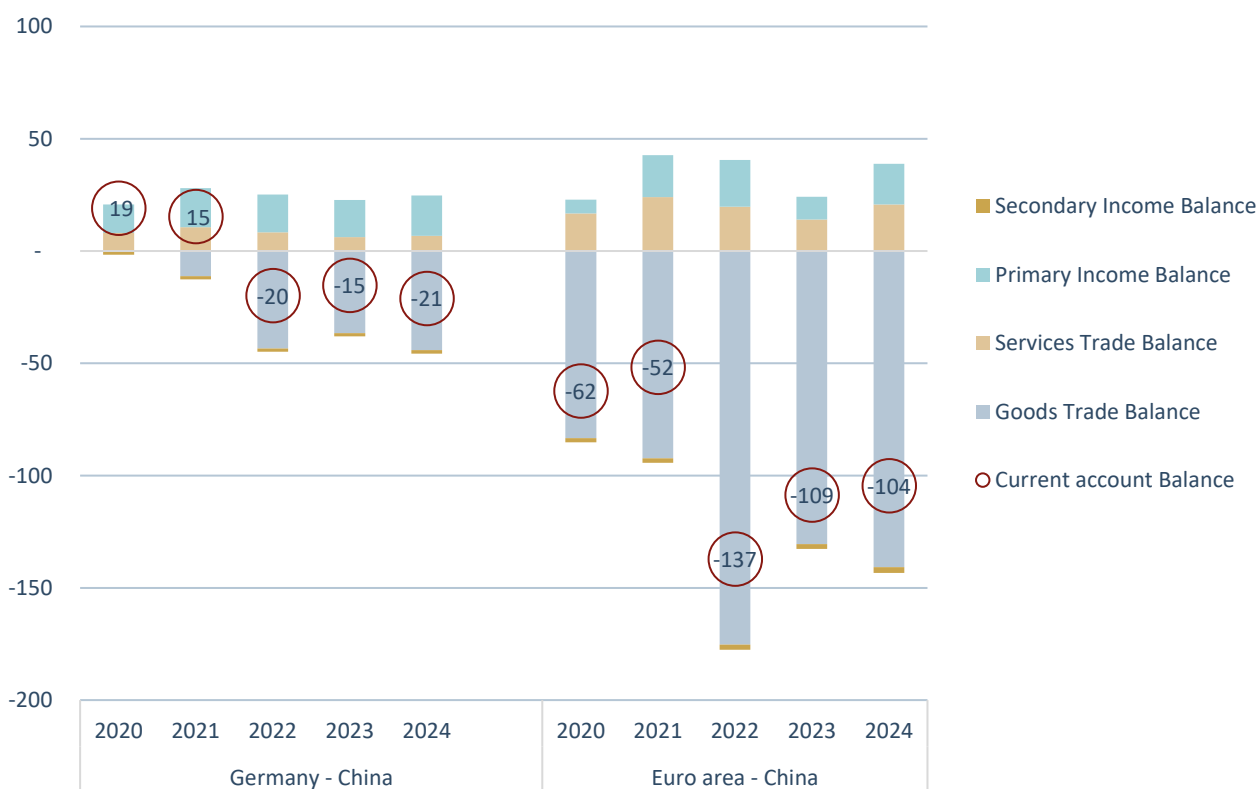
A brief methodological remark is required here: As the balance of payments statistics uses a different measurement method for merchandise goods trade, there are some quantitative differences which need to be briefly mentioned as the further analysis relies on the balance of payment data (Figure 3-1). The merchandise trade deficit is generally lower when measured using the methodology of the balance of payments statistics (darker shades) compared to the foreign trade statistics (same colour, lighter shade). As this lower measure is used below, the extent of the demand for Yuan tends to be underestimated compared to the foreign trade statistics.

However, other components of the bilateral balance of payments statistics also have to be looked, namely the **current account balance** and the **financial account balance**.

The bilateral **current account** includes not only trade in merchandise goods, but also trade in services (and the related payment flows). There is a positive balance (i.e. a surplus) in services trade with China for Germany and the Euro area, respectively (Figure 3-2). Moreover, primary and secondary income flows are included, among which only primary capital incomes from European foreign direct investments (FDI) in China play a significant quantitative role in the economic relations of Germany and the Euro area with China. The current account statistics record a positive balance here as well.

Figure 3-2: Components of the Current Account Balance of Germany and the Euro area with China

Data in EUR billions



Sources: Deutsche Bundesbank; ECB; German Economic Institute

Concerning the effect of the exchange rate market, a services trade surplus and a surplus in primary capital income flows from China to the Euro area imply a net supply of Yuan. *Ceteris paribus*, this tends to lead to a lower Yuan exchange rate against the Euro – or, vice versa, a higher demand for Euro in Yuan and thus a higher Euro exchange rate in Yuan. Thus, these components reduce the net demand for Yuan (in Euro) to some degree that results from the comparatively rather high merchandise trade deficit. Overall, the bilateral current account balance was still negative in recent years to a significant extent. Moreover, it considerably worsened when comparing the years 2022 to 2024 against the preceding years 2020 and 2021, despite including the other components of the current account balance that did not change much in absolute terms.

The bilateral **financial account** includes incoming and outgoing capital flows. It consists of the following categories: FDI, portfolio investments (mostly equities and debt securities) and other investments (particularly bank loans).

Concerning the effect on the exchange rate market, a capital export from Europe to China implies a demand for Yuan in Euro. Thus, a higher capital export would, *ceteris paribus*, increase the Yuan exchange rate against the Euro on a free exchange rate market. The opposite is true for a capital import from China to Europe – higher capital flows in this direction would mean a greater supply of Yuan and thus a lower Yuan exchange rate against the Euro.

Below, the development of the bilateral balance of payments statistics with China is analysed for Germany and the Euro area in order to determine whether there is evidence for increasing net demand for the Yuan in Euro – or respectively lower net demand for Euro in Yuan. If this could be proved, the broad constancy of the Yuan exchange rate against the Euro between 2020 and 2025 (Chapter 2) could be deemed to not be market-based. This would mean that the way China manages its exchange rate leads to a deviation from expected market outcomes. Thus, this analysis has the potential to provide relevant evidence to answer the questions about possible currency manipulation and unfair undervaluation of the Yuan against the Euro.

3.2 Estimating net demand for Yuan on the exchange rate market

First, the perspective from Germany is analysed, even though this is not sufficient to draw conclusions about the value of the Euro. However, there is better availability of data for Germany.

Germany

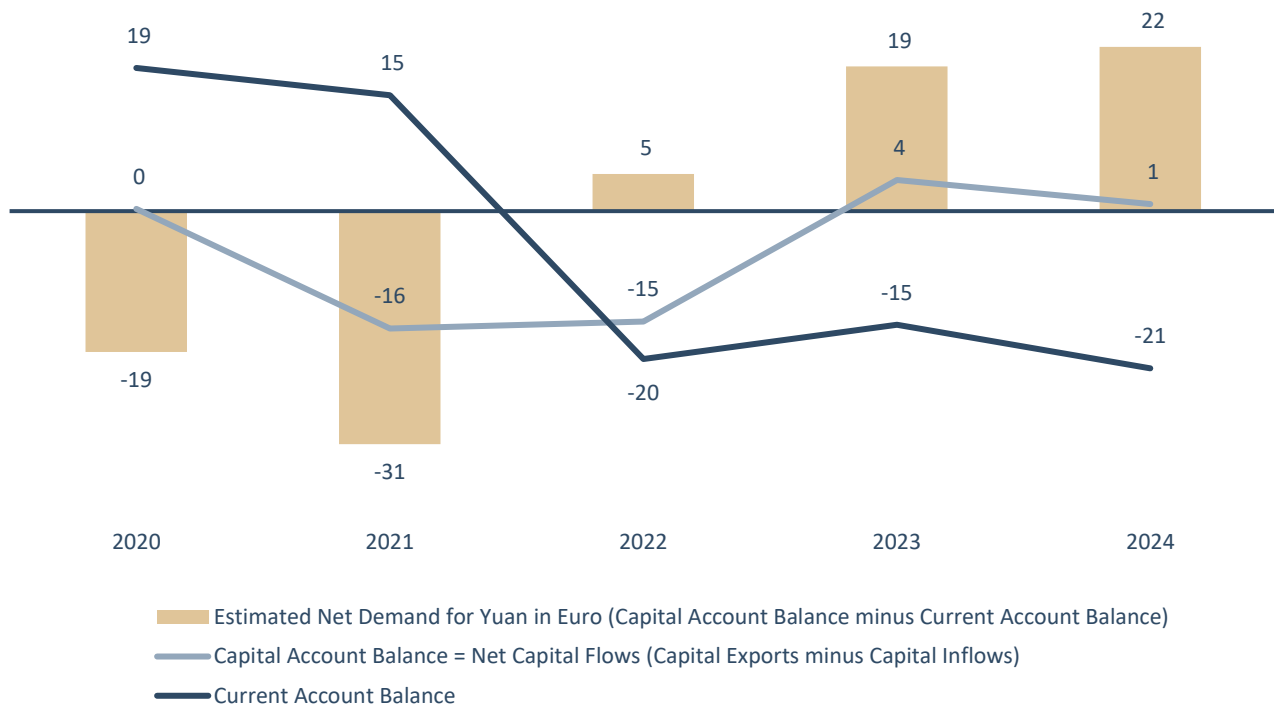
The Deutsche Bundesbank provides full coverage of the bilateral balance of payments between Germany and China, including capital exports and capital imports so that net capital flows can be calculated. With this data, the net demand for Yuan in Euro can be estimated, when also including the current account balance. The aim here is to determine whether or not the change in the net demand for Yuan is broadly in line with the development of the Yuan exchange rate against the Euro.

Figure 3-3 shows that in 2020 and 2021, Germany had a current account surplus with China based on balance of payments data. This implies a negative net demand for Yuan in Euro (i.e. a net demand for Euro in Yuan). Net capital flows were zero in 2020 and negative in 2021 (implying net capital imports), which renders the net demand for Yuan in Euro even lower in 2021. This situation changed in 2022 when the current account balance turned significantly negative due to a large rise in the merchandise trade deficit (Figure 3-3). In 2023 and 2024, the current account balance remained negative at similar levels. What is more, net capital flows

also increased and turned slightly positive in 2023, implying net capital exports to a small degree. Thus, there was a significant shift in the net demand for Yuan in Euro from a negative to a positive position. This shift amounts to about EUR 50 billion between 2021 and 2024 and appears large relative to the pre-existing levels of this net demand. Judged by this metric, the Yuan should tend to have appreciated in 2024 compared to 2021 – which did not happen.

Figure 3-3: Germany: Estimation of Net Demand for Yuan in Euro based on Balance of Payments Data

Data in EUR billions based on bilateral Balance of Payments Data between Germany and China



Sources: Deutsche Bundesbank; German Economic Institute

Euro area

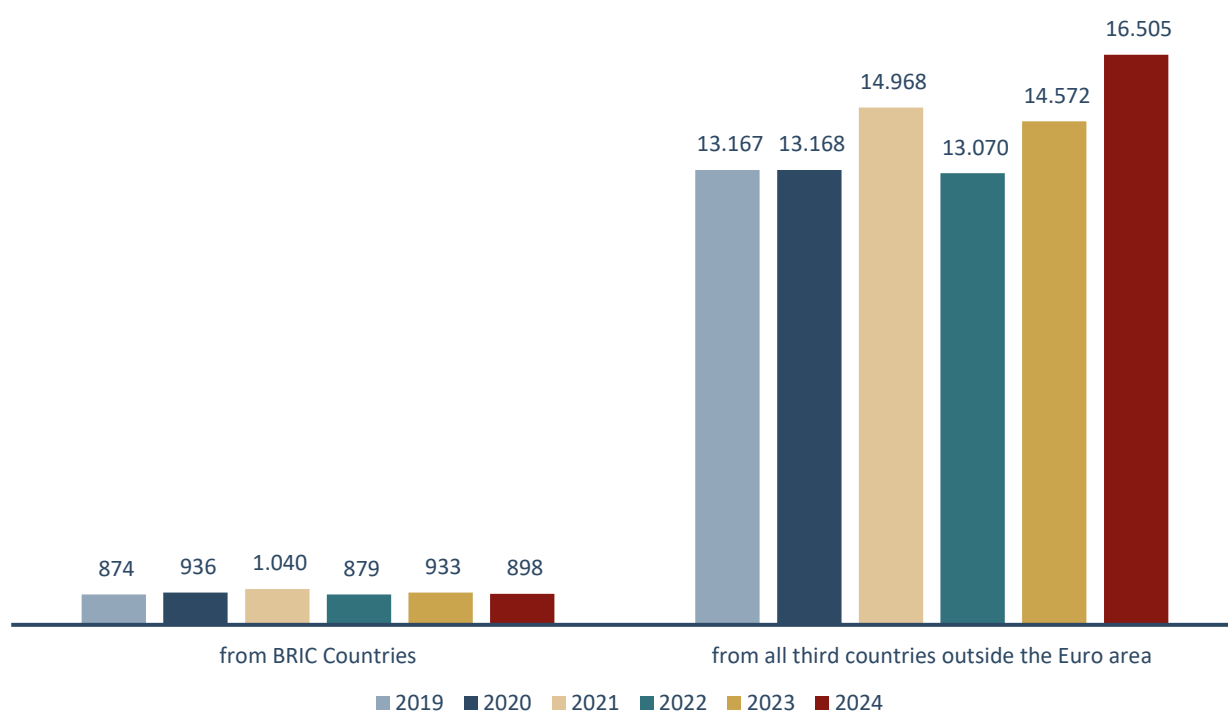
It is obviously not sufficient to look only at Germany, as the Euro area as a whole has to be taken into account when making a judgement about the Euro exchange rate. Thus, the bilateral balance of payments between the Euro Area and China is analysed below. However, data problems occur. While the ECB provides data for the current account balance and for capital exports, it does not provide data for total capital imports. In particular, there is no data for portfolio investment inflows from China and from other countries; moreover, also no data is available for inward portfolio investment stocks from China in the Euro area, while such stock data exists for the aggregate of BRIC-countries (Brazil, Russia, India, China).

However, the possibility exists of broadly estimating portfolio investment inflows from China into the Euro area. The approach taken here relies on available data on portfolio investment inward stocks from BRIC countries into the Euro area and on total portfolio investment inward stocks from all third countries (Figure 3-4). In brief, the basic idea is to estimate the portfolio investment inflows from China to the Euro area by relying on the change in BRIC-inward stocks over time, make adjustments for value changes to identify the actual flows and then correct for China's share of the BRIC countries.

This approach can be explained in more detail as follows: From a methodological perspective, the change in inward portfolio investment stocks from one year to the next has several components: the inward portfolio flow and several value adjustments of the existing stock valuation that mainly result from changes in prices and exchange rates as well as from other changes. As the overall yearly total differences of the BRIC portfolio investment stocks in the Euro area can be calculated with the available data, the flow component has to be isolated from this total difference by subtracting the total value adjustment component.

Figure 3-4: Comparing Portfolio Investment Stock in the Euro area: BRIC Countries vs. all third Countries

Inward stock of portfolio investments in the Euro area from in EUR billions



Sources: ECB; German Economic Institute

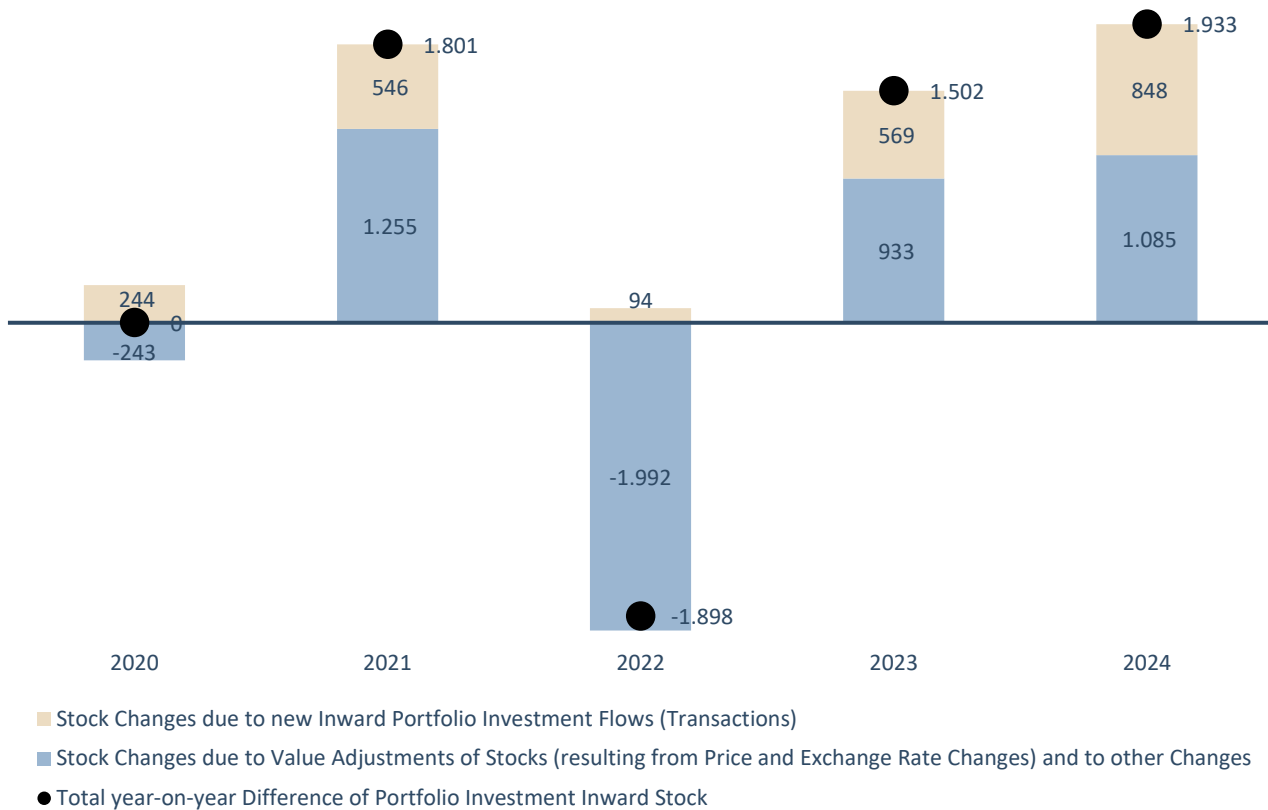
While there is no data for the value adjustment components for BRIC countries' stocks, such data is available for overall inward stocks from all third countries in the Euro area, for which Figure 3-5 shows how the yearly differences can be broken down into the total value adjustment component and the component of portfolio investment inflows (transactions). While transactions are always positive, albeit to a different degree, the value adjustment component is positive or negative over the depicted years. It is particularly negative in 2022 because portfolio investment assets in the Euro area lost value, mainly due to the Russian invasion of Ukraine and the ensuing fears of an energy crisis and the rise in energy costs.

The value adjustment component for the overall inward portfolio investment stock from all third countries in the Euro area is key for the following estimation. It can be plausibly assumed that the yearly value adjustment is the same (as a percentage of the existing stock) for inward portfolio investment stocks in the Euro area coming from all third countries and for those coming from BRIC countries. With this assumption, the flow (transaction) component of the stock change for BRIC countries can be estimated: It is calculated on a yearly basis as the difference between the portfolio investment inward stock change and the respective assumed value adjustment component of the inward investment stock of BRIC countries. Based on this

estimation of the inward portfolio flows of the BRIC countries into the Euro area, the Chinese component of this flow is estimated by assuming a Chinese share in the BRIC flows of 70 per cent which broadly corresponds to China's share of the total GDP of the BRIC countries.

Figure 3-5: Components of the Change of Inward Stock of Portfolio Investment in the Euro area from all third countries

Data in EUR billions



Sources: ECB; German Economic Institute

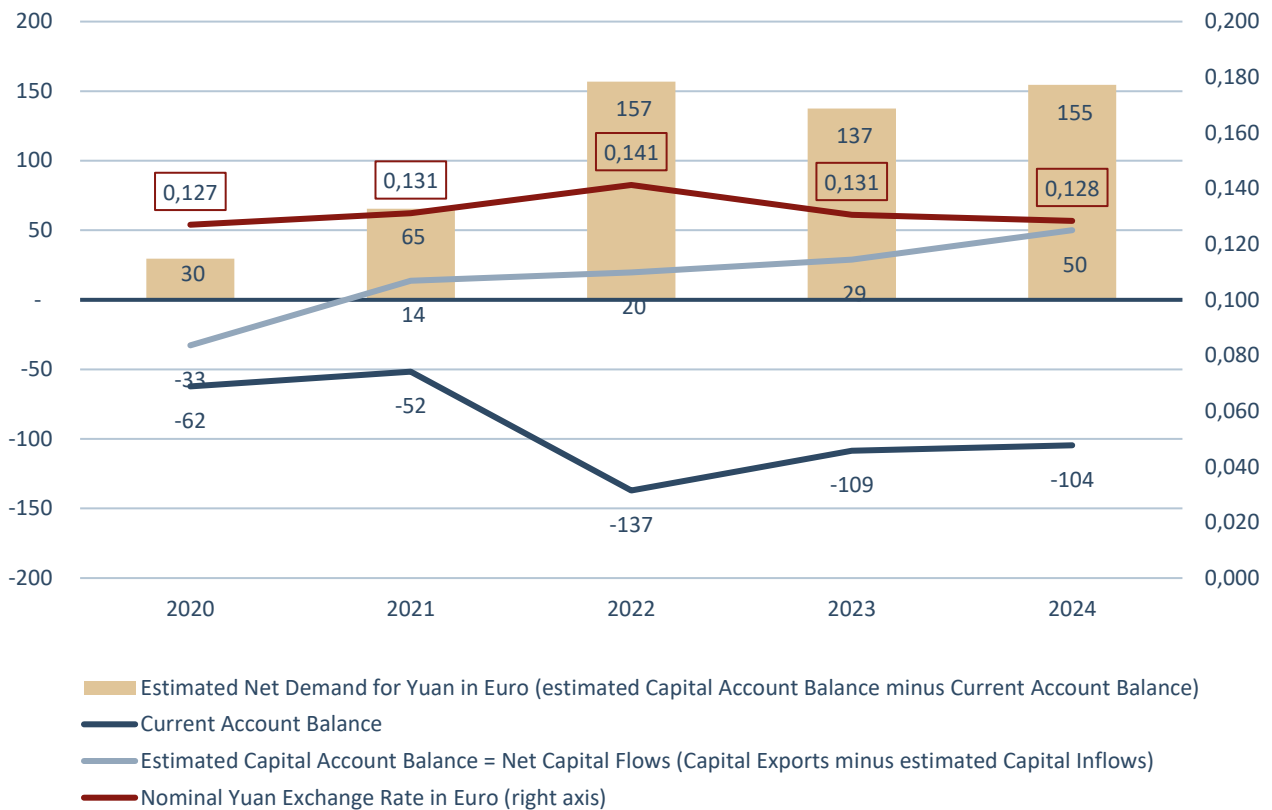
With this assumption for portfolio investment inflows from China to the Euro area, the total capital inflows from China to the Euro area and thus net capital flows can be estimated. Based on this, the net demand for Yuan in Euro can be derived from the difference between the current account balance and the financial account balance (net capital flows). The general picture for the Euro area is similar to that for Germany.

As the current account balance turned more negative from 2022 onwards and as the financial account balance improved, the net demand for Yuan in Euro increased considerably over time. The difference between the estimated values of this net demand for Yuan for 2024 and for 2020 lies at an estimated value of EUR 125 billion. This difference would increase to more than EUR 160 billion, if it is assumed that the Chinese share in the portfolio investment inflows from BRIC countries is not 70 per cent but 90 per cent.

Despite this major increase in net demand for the Yuan, the nominal Yuan exchange rate against the Euro was basically on the same level in 2024 that it was in 2020 (see also Figure 2-2b), even though it should have appreciated considerably. In 2025, the further depreciation of the Yuan further aggravates this result.

Figure 3-6: Euro area: Estimation of Net Demand for Yuan in Euro based on Balance of Payments Data

Data in EUR billions based on bilateral Balance of Payments Data between the Euro area and China



Sources: Deutsche Bundesbank; ECB; German Economic Institute

Another typical indication of currency manipulation would be, if the Euro reserves of the Chinese central bank had risen. However, to the knowledge of the author, the Chinese central bank only publishes the development of its total reserve holdings, but does not publish a break-down between different currencies. Thus, this indicator cannot be further analysed.

4 Conclusion

These findings provide strong indications of a significant undervaluation of the Yuan against the Euro. If there had been a free and market-based bilateral exchange rate market, the rising net demand for Yuan in Euro in recent years should have led to an appreciation of the Yuan against the Euro. As this was prevented by the central bank of China's currency management policies, this has resulted in a considerable unfair price advantage on the world market for China, which comes at the expense of Euro area companies that compete with Chinese firms. The large increase in the merchandise trade deficit with China is a clear indication of the relevance of the Yuan undervaluation. As mentioned above, the merchandise trade deficit is even larger when measured using the foreign trade statistics. Such a large deficit would probably not have occurred if the Yuan had been allowed to float freely against the Euro, as is the case with the currencies of most industrial countries outside the Euro area, for example.

While the exact degree of Yuan undervaluation is difficult to pin down, Chapter 2.4 provides evidence that the real bilateral exchange rate of the Yuan against the Euro based on PPIs depreciated by nearly 30 per cent

between January 2020 and April 2025. This result can serve as a broad indication that the Yuan undervaluation is very substantial.

As far as the real depreciation of the Yuan can be assumed to be the main cause of the large increase in the merchandise trade deficit (a claim that requires further research), there are reasons for gauging that the nominal Yuan exchange rate should appreciate to a similar degree again in order to restore the original real cost relation that was prevalent before the exogenous shock hit – assuming that the exchange rate elasticity of the trade deficit is similar in both directions. For Germany, the merchandise trade deficit is a relatively good measure for gauging the size of the required appreciation, because the difference in the net demand for Yuan (in Euro) between 2020 and 2024 is nearly only accounted for by the change in the German merchandise trade deficit with China, while the other components of the bilateral balance of payments components hardly play a role (Figures 3-2 and 3-3). For the Euro area, in addition to the considerably higher merchandise trade deficit, net capital exports have also increased strongly in this period (by far overcompensating increases in the surpluses of the services and primary income balances). Thus, the higher net capital exports tend to call for an even larger nominal Yuan appreciation.

The International Monetary Fund (IMF, 2024) has not (yet) criticised the misalignment of the Yuan against the Euro to the knowledge of the author. This can probably be explained by the fact that the IMF usually focuses on the exchange rate relationship between the Yuan and the US Dollar. In fact, the bilateral real exchange rate of the US against China has appreciated to a smaller extent, as producer prices in the US rose less than in Europe. However, the IMF should reconsider its position and also take account of the European perspective because the management of the Yuan by the Chinese government largely ignores this angle.

Also, the renowned economist Brad Setser (2025) has recently started to look critically at the Yuan by pointing to a real effective exchange rate appreciation of the Yuan against 64 countries based on data from the Bank for International Settlements. This data shows a real effective depreciation of the Yuan by 13 per cent between January 2020 and May 2025, albeit based on consumer prices and not on producer prices, the latter of which are more relevant for European industries that compete with Chinese industries.

As long as the Chinese government does not implement the required sizeable nominal Yuan appreciation against the Euro, Europe must cope with immense cost disadvantages vis-à-vis China. The serious problems of ever higher competition from China cited in Chapter 1 (Matthes, 2023; Matthes 2024) are very likely also caused by the Yuan undervaluation against the Euro. This is particularly true for the major price undercutting by Chinese competitors of more than 30 per cent, as reported by German industrial firms in an IW survey.

Barring an adequate Chinese reaction, these competitive distortions call for robust trade policy action in order to re-establish a level playing field in terms of real bilateral exchange rate relations and thus effective cost relations between Europe and China. In fact, the significant undervaluation of the Yuan adds to the detrimental effects on European industries that originate from high and various subsidies for firms in China. What is more, an undervaluation is an implicit subsidy for *all* Chinese goods at the same time. Thus, the question arises whether antisubsidy investigations could be used in a broad way to tackle this encompassing problem. Moreover, in individual antisubsidy cases, it should be considered whether countervailing duties can be set significantly higher when taking the large Yuan undervaluation into account. The European Commission and trade law experts should urgently find ways to render such steps possible within WTO law or at least within the realm of the spirit of the WTO.

Figures

Figures 2-1a and 2-1b: Merchandise Trade of Germany and the Euro area with China.....	5
Figures 2-2a and 2-2b: Yuan Exchange Rate against the Euro	7
Figure 2-3: Diverging Producer Price Developments in Europe and China	8
Figure 2-4: Relative PPI Development and Change in Real bilateral Exchange Rate: Different Perspectives.....	9
Figure 3-1: Differing data for the Merchandise Trade Balance from different Statistical Sources.....	12
Figure 3-2: Components of the Current Account Balance of Germany and the Euro area with China.....	13
Figure 3-3: Germany: Estimation of Net Demand for Yuan in Euro based on Balance of Payments Data	15
Figure 3-4: Comparing Portfolio Investment Stock in the Euro area: BRIC Countries vs. all third Countries	16
Figure 3-5: Components of the Change of Inward Stock of Portfolio Investment in the Euro area from all third countries	17
Figure 3-6: Euro area: Estimation of Net Demand for Yuan in Euro based on Balance of Payments Data	18

References

Al-Haschimi, Alexander et al., 2024, Why competition with China is getting tougher than ever, ECB Blog, 3.9.2024, <https://www.ecb.europa.eu/press/blog/date/2024/html/ecb.blog240903~57f1b63192.en.html> [26.6.2025]

IMF – International Monetary Fund, 2024, People’s Republic of China, IMF Country Report, No. 24/258, Washington D.C.

Matthes, Jürgen, 2023, Entwicklung des Konkurrenzdrucks durch China auf dem EU-Markt, IW-Report, No. 39, Cologne, <https://www.iwkoeln.de/studien/juergen-matthes-entwicklung-des-konkurrenzdrucks-durch-china-auf-dem-eu-markt.html> [14.7.2025]

Matthes, Jürgen / Schmitz, Edgar, 2024a, Konkurrenzdruck aus China für deutsche Firmen, IW-Report, No. 30, Cologne, <https://www.iwkoeln.de/studien/juergen-matthes-konkurrenzdruck-aus-china-fuer-deutsche-firmen.html> [14.7.2025]

Matthes, Jürgen, 2024b, Importseitiges De-Risking von China im Jahr 2023. Eine Anatomie hoher deutscher Importabhängigkeiten von China, IW-Report, No. 18, Cologne