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Patterns of Invoicing Currency in Global Trade in a Fragmenting World Economy

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September 2025

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JEL Classification Numbers:	F14, F31, F44.
Keywords:	Trade invoicing currency; dominant-currency paradigm; geopolitical alignment.
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Patterns of invoicing currency in global trade in a fragmenting world economy*

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September 5, 2025

Abstract

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1 Introduction

Most global trade is invoiced in just a few currencies—primarily the US dollar and, to a lesser extent, the euro—regardless of the countries involved in the transaction (Goldberg & Tille 2008, Gopinath 2015, Boz et al. 2022). This empirical regularity has prompted a shift in international macroeconomics away from the traditional open-economy framework, in which export prices are set in the producer's currency, toward a dominant-currency paradigm. In this framework, export prices are typically set in a single dominant currency, most often the US dollar (Gopinath et al. 2020, Gopinath & Itskhoki 2022). Dominant-currency pricing implies markedly different responses to exchange rate fluctuations compared to producer-currency pricing, with important implications for international spillovers, optimal monetary and fiscal policy, and international policy coordination (Egorov & Mukhin 2023, Basu et al. forthcoming).

While earlier literature has firmly established the dominance of a few currencies in global trade invoicing over recent decades, several secular trends and distinct events since 2020 have significantly reshaped the global trade landscape. In particular, the rise of China and other emerging market economies, the COVID-19 pandemic with associated supply chain disruptions, and the growing risk of geopolitical fragmentation following Russia's invasion of Ukraine have profoundly altered global trade relationships (Alfaro & Chor 2023, Freund et al. 2024, Bonadio et al. 2024, Gopinath et al. 2025*a*). Despite a surge in research motivated by these developments, evidence on the evolution of global trade invoicing currency patterns—particularly in relation to geopolitical realignments—is scarce.

The dataset compiled by Boz et al. (2022) represents the most comprehensive and up-to-date panel on global trade invoicing currency patterns currently available. However, its coverage ends in 2019, just before the onset of the COVID-19 pandemic and Russia's invasion of Ukraine. Furthermore, while the dataset includes invoicing shares for the US dollar, the euro, and home currencies, it does not report data for the Chinese renminbi. As such, it remains unclear how renminbi use has evolved across time and countries, and whether recent geopolitical developments have had any measurable impact on global trade invoicing currency patterns.

We address this gap by updating and extending the dataset of Boz et al. (2022)—and thereby earlier work by Kamps (2006), Goldberg & Tille (2008), Ito (2014), and Gopinath (2015)—and by providing new evidence on recent developments in global trade invoicing currency patterns, with particular focus on the role of geopolitical alignment. Specifically, we expand the original dataset to include observations for the period 2020–2023, which allows us to analyze shifts in invoicing behavior in the context of heightened geopolitical tensions. In addition, we incorporate data on the Chinese renminbi, which allows us to examine whether there has been a shift in trade invoicing away from the

US dollar toward currencies of countries that are less closely aligned with the US. Our updated and extended dataset is an unbalanced panel comprising invoicing currency shares in imports and exports for 132 countries from 1990 to 2023. It covers the US dollar, the euro, and the Chinese renminbi, and, for many countries, their respective home currencies.

Our dataset and analysis yield five key findings. First, trade invoicing currency shares have remained broadly stable at the global level, despite rising geopolitical tensions. The US dollar continues to dominate global trade invoicing. While the euro is used less frequently than the dollar, it is nonetheless used as a vehicle currency to some extent in trade among certain African and European countries outside the euro area.

Second, the renminbi continues to account for a modest share of global trade invoicing. At the same time, its role has expanded steadily since the early 2010s, in fact quite rapidly in recent years. Initially, the increase in renminbi invoicing was concentrated in Asia, but it has gradually extended to other regions of the world, especially Europa and Latin America. While our dataset does not distinguish between renminbi invoicing of trade with China as opposed to trade between third countries, the evidence suggests that it is unlikely to be used widely as a vehicle currency. This inference is supported by the fact that the value of China's trade alone substantially exceeds the total value of global trade invoiced in renminbi captured in our dataset.

Third, countries least geopolitically aligned with the US tend to rely disproportionately on the dollar as a vehicle currency. However, because these countries account for a smaller share of global trade, the total value of their exports invoiced in dollars remains lower than that of countries most aligned with the US. The use of the dollar as a vehicle currency in trade of US least-aligned countries has been declining since the early 2010s, driven primarily by a few economies—most notably Russia—rather than reflecting a broad-based shift over this longer time span. In contrast, the euro's role as a vehicle currency in trade of euro area least-aligned countries is much smaller.

Fourth, geopolitical distance emerges as an increasingly important correlate of currency choice in trade invoicing. Over the full span of our sample period, the use of the US dollar and the euro in trade invoicing has not been systematically related to geopolitical alignments. In contrast, the renminbi has been more commonly used by exporters that are geopolitically closer to China over the full span of our sample period. However, since Russia's invasion of Ukraine in 2022, patterns for the dollar and the euro have changed: the correlation between the use of the dollar and especially the euro on the one hand and geopolitical distance from their respective issuers on the other hand has become more negative. Overall, we find that as countries have moved geopolitically away from the US or the euro area, they have increasingly substituted the dollar and the euro with the renminbi, their own currencies, or third-country currencies. Conversely, since 2022, countries that have distanced

themselves from China have shown a greater propensity to use the dollar, while reducing reliance on their own or other third-party currencies. These developments point to a fragmentation in global trade invoicing currency patterns along geopolitical lines, as countries that have moved closer to the US have typically distanced themselves from China.

Fifth, there is no systematic evidence that policy initiatives by some countries have reduced reliance on the US dollar in oil trade.

Related literature. Our study contributes to the long-standing debate on the future of dollar dominance in the international monetary system (Portes & Rey 1998, Chinn & Frankel 2008, Posen 2008, Eichengreen 2011, Ito 2017, Eichengreen & Lombardi 2017). By analyzing trends in global invoicing in dollars, euros, and renminbi over time, we offer new insights into prominent perspectives on the evolution of the international monetary system. We find that while the dollar remains unchallenged as the dominant currency for global trade invoicing, the renminbi has been gaining ground rapidly and across most regions. Furthermore, we provide novel evidence that invoicing currency patterns are increasingly shaped by geopolitical alignment. In doing so, our paper also contributes to the broader literature on dominant currencies (for an overview, see, e.g., Eichengreen, 2011; Rogoff, 2025).

Our paper contributes to the rapidly expanding literature on geoeconomics (for a survey, see Clayton et al. 2025, Mohr & Trebesch 2025). Clayton et al. (forthcoming) develop a framework in which geoeconomic power is defined as a hegemon's capacity to coordinate threats across diverse economic relationships in international trade to advance geopolitical or economic objectives. Extending the analysis, Clayton et al. (2024) discuss how targeted countries internalize a hegemon's incentives and try to reduce their exposure to its geoeconomic power *ex ante*; Liu & Yang (2025) present an analysis of bilateral geoeconomic power exposures through trade and countries' *ex ante* strategic behavior in this context in a similar spirit. Broner et al. (2025) and Camboni & Porcellacchia (2025) study how countries adjust their geopolitical alignment as a second hegemon emerges in a multipolar world. Bianchi & Sosa-Padilla (forthcoming) study how the use of international financial sanctions for geopolitical motivations can undermine the US dollar's hegemonic reserve currency status, while Pflueger & Yared (2024) explore the complementarity between military might and debt capacity in determining hegemonial currency dominance. We contribute to this literature by providing empirical evidence on the relationship between geopolitical alignment and the choice of invoicing currencies in global trade.

We also contribute to the growing literature on renminbi internationalization (for surveys, see Cheung 2023, von Beschwitz 2024). Bahaj & Reis (forthcoming) and Song & Xia (2020) provide evidence that swap lines extended by the People's Bank of China (PBoC) promote renminbi use in cross-border payments. Perez-Saiz & Zhang (2023) further show that cross-country variation in renminbi usage

is correlated with geographic and political proximity to China, trade linkages, and the presence of renminbi clearing banks. Our contribution lies in shifting the focus from settlement to invoicing: we provide new data on renminbi invoicing across a large sample of countries and demonstrate that settlement data for China's trade may not be a reliable proxy for invoicing. Georgiadis et al. (2021) analyze the effectiveness of PBoC policy initiatives using data collected, but not published, by Boz et al. (2022) for a much smaller country sample than we compile in our paper. Chowdhry (2024) uses French customs data to document a steady rise in renminbi invoicing in exports to China over the past 15 years. Jiao et al. (2024) document that South Korean firm and product-level exports to China have been growing faster if invoicing is in renminbi. Our paper adds a global perspective, showing how renminbi invoicing trends relate to dollar and euro usage, as well as to countries' geopolitical alignment with the US and China.

Our paper also relates to the emerging literature on the impact of sanctions on trade invoicing currency patterns. Berthou (2023) documents that US sanctions following Russia's annexation of Crimea in 2014 prompted French exporters to reduce their reliance on dollar invoicing. Chupilkin et al. (2023) show that the share of Russia's imports invoiced in renminbi increased significantly after the invasion of Ukraine, displacing both the euro and the dollar. Similarly, Corsetti et al. (2024) find that Turkish exporters shifted toward invoicing in Turkish lira at the expense of the dollar in response to a surge in trade with Russia. While these studies focus on individual country cases, our analysis takes a broader perspective by examining how geopolitical alignment shapes invoicing currency patterns in global trade.

Finally, our paper also contributes to the literature on trade invoicing currency transitions. While invoicing patterns tend to be persistent at the aggregate level, theory suggests that transitions can occur rapidly in response to extraordinary events (Mukhin 2022). Consistent with this, Crowley et al. (2024) and Garofalo et al. (2024) document a swift and substantial shift from British pound to US dollar invoicing in UK trade following the Brexit vote in 2016. Similarly, Benguria & Wagner (2024) show that the introduction of the euro area led to a rapid and sizable increase in the share of Chilean exports invoiced in euros. More recently, Benguria & Novy (2025) find that the establishment of a swap line with the PBoC during a severe dollar shortage in 2023 triggered a sharp rise in renminbi invoicing for Argentina's imports from China that displaced the dollar. We extend this literature by examining whether the geopolitical fragmentation following Russia's invasion of Ukraine has been associated with broader transitions in global trade invoicing currency patterns.

The remainder of the paper is organized as follows. Section 2 provides background on the invoicing currency data and describes our data collection efforts. Section 3 presents stylized facts on trends in invoicing currency patterns in global trade. Section 4 examines the relationship between geopolitical

alignment and invoicing currency patterns, while Section 5 focuses specifically on commodity trade. Section 6 concludes.

2 Updated and expanded dataset of trade invoicing currencies

2.1 Background

Establishing patterns in invoicing currency in global trade is challenging as the relevant information is not readily available in standard cross-country datasets. For example, Comtrade (compiled by the United Nations, UN) and the Direction of Trade Statistics (compiled by the International Monetary Fund, IMF) include detailed information on bilateral goods trade, but do not provide information on invoicing currency patterns. The seventh edition of the IMF's Balance of Payments Manual (BPM) published in March 2025—the primary set of guidelines coordinating global accounting standards for external sector statistics—encourages countries to report information on trade invoicing currency as a supplementary item, but only from 2029-30 onward.

Invoicing currency information is generally recorded in customs declarations, which may differ across countries and time depending on national legislation. Disclosure of such information is not always mandatory, and may not even be requested at all. Moreover, even if the information is provided in customs declaration forms, it might not be stored or processed by customs authorities, or transmitted to other authorities, such as national statistics offices or central banks. Overall, there is large cross-country heterogeneity in the reporting and processing of trade invoicing currency information. Only few countries routinely provide official data on trade invoicing currency.[1]

2.2 Updating and expanding the dataset of Boz et al. (2022)

For EU countries, we rely on four different data sources. First, as in Boz et al. (2022), we draw on the annual data collection exercise on trade invoicing currency carried out for the ECB's annual report on the *International Role of the Euro* (IRE; see, e.g., European Central Bank 2025). Second, again as in Boz et al. (2022), we use data saved in non-public ECB archives that are no longer reported by national authorities in the context of past annual IRE data collection exercises and that were never published. Third, again as in Boz et al. (2022), we draw on data from Eurostat. Fourth, going beyond Boz et al. (2022), we request invoicing currency information—especially for the renminbi (CNY), which is not reported in the ECB IRE report data collection exercises—from national central banks through the Eurosystem's Working Group of External Statistics. A key challenge associated

[1] Data on trade finance currency or trade payment currency from the Society for Worldwide Interbank Financial Telecommunication (Swift) are sometimes used as proxies for trade invoicing. See Boz et al. (2022) for a discussion.

with trade invoicing currency data for EU countries is that they are typically available for different trading-partner compositions, both across countries and within a country over time, mainly due to changes in definitions and reporting procedures. Boz et al. (2022) provide a detailed discussion of the complications in piecing together consistent trade invoicing currency time series for EU countries.

For non-EU countries, we first search online for publicly available, official information on trade invoicing currency. If such data are not available online—which is the case for most countries—we request the data from national authorities for their respective jurisdictions. A challenging component of the data requests is identification of the relevant counterparts and establishing contact. This step is not straightforward despite the extensive inter-institutional relationships between the IMF/ECB and national authorities. To overcome this challenge, we leverage a broad set of formal and informal contacts at the ECB, the IMF, the European Bank for Reconstruction and Development, the African Development Bank, the African Association of Central Banks, the Asian Development Bank, the Bank for International Settlements, and the South East Asian Central Banks Centre.

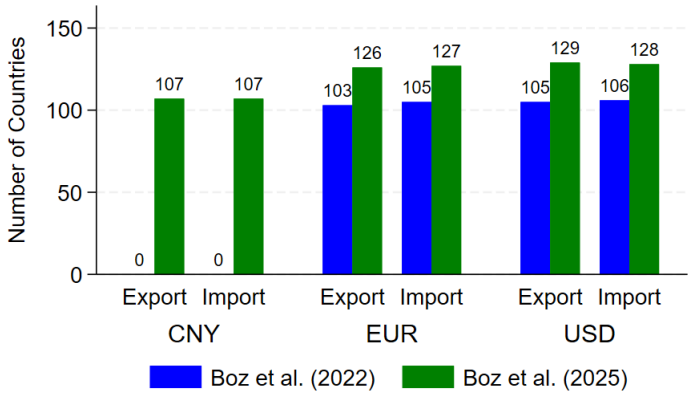
Overall, we contact national authorities of around 120 countries between June 2024 and July 2025. In particular, we contact governors' offices and senior officials in the statistics, payments and international departments of non-EU central banks with a formal request for information on their country's trade invoicing currency patterns. We first contact central banks because they are the IMF's and especially the ECB's most natural counterparts. If we do not receive a response, or if the invoicing currency data is not available from central banks, we turn to statistics offices, and subsequently to ministries of finance and customs/revenue authorities. If the invoicing currency data is not readily available, we ask national authorities to compile it for us, drawing on raw customs records. The data for more than half of the countries in our dataset are obtained through such requests.

Figure 1 compares the country coverage of our updated and expanded dataset with that of Boz et al. (2022). Figure 1 documents that we have information on US dollar and euro invoicing patterns for about 20% more countries in our new dataset compared to Boz et al. (2022), with additional information for 2020-23 for generally all countries. Moreover, and importantly, compared to Boz et al. (2022) we have information on renminbi invoicing patterns for more than 100 countries.

2.3 Data properties and definitions

Lack of harmonized data is another challenge in assembling a dataset of trade invoicing currency patterns. In particular, it would be ideal if the data we receive from different countries were consistent regarding the statistical methodology of data collection, the coverage of currencies, trade transactions in terms of goods or services and trading partners, and the definition in terms of trade invoicing rather than settlement currency. Unfortunately, until the publication of the seventh edition of the

Figure 1: Country and currency coverage relative to Boz et al. (2022)



Note: The figure presents a comparison of the country coverage of the dataset of Boz et al. (2022, blue) and our new dataset (orange) by currency and trade flow. Our dataset includes invoicing currency information for a total of 132 countries. The maximum number of countries that report invoicing currency information on either US dollar, euro or renminbi shown in the figure is lower, because some countries only report, for example, import invoicing shares but not export invoicing shares. In this case, this country enters the import but not the export count show in the figure. The reverse case in which a country reports export but not import invoicing shares also exists. This then drives a wedge between the overall country count of 132 and the export/import country counts shown in the figure.

IMF BPM in March 2025, there was no global standard that would ensure a harmonized reporting of trade invoicing currency data. Note that the lack of harmonized data across countries and over time has also afflicted earlier efforts that assembled cross-country data sets of invoicing currencies.

As a result, the precise definition of "invoicing currency" sometimes differs across countries and even within a country over time. For example, following previous research (e.g., Gopinath 2015), in a few cases we use information on settlement currency for countries in which information on invoicing currency is not available.[2] An important case in point is China, given the large interest in the evolution of the role of the renminbi in the absence of trade invoicing currency information. In particular, in the next section we exploit the information on renminbi invoicing shares of the other countries in our dataset to explore whether settlement currency is a useful proxy for invoicing currency for China's trade.

2.4 Is China's settlement currency a useful proxy for invoicing currency?

China's authorities have adopted several measures to promote the international use of the renminbi, specifically in trade settlement (see, e.g., Eichengreen et al. 2022, Chowdhry 2024, von Beschwitz 2024, for detailed discussions). For example, the PBoC launched a pilot program to promote the use of the renminbi for trade settlement in 2009, initially restricted to five cities from Chinese mainland in

[2]Information on trade settlement currency patterns is typically recorded by central banks in the context of compiling balance-of-payments statistics. We document below how trade settlement and trade invoicing currency relate for some countries for which we have information on both. Note also that the seventh edition of the IMF BPM recommends reporting settlement currency as a proxy for invoicing currency.

addition to Hong Kong, Macau and ASEAN members, and expanded in 2012 to cover all Chinese firms and external trade. Moreover, offshore markets in renminbi have been developed in major financial centers, such as Hong Kong, London, and Singapore, to support cross-border renminbi transactions. The PBoC has furthermore signed several swap agreements with foreign central banks to provide (backstop) liquidity in renminbi with the stated objective to facilitate trade settlements in renminbi (see People's Bank of China 2012, Bahaj & Reis forthcoming). The Shanghai Petroleum and Natural Gas Exchange was launched in 2018, and China has started to use renminbi to settle oil imports from several key producers. The Belt and Road Initiative further aims to encourage use of the renminbi in infrastructure projects and trade by participating countries.

Testifying to the effectiveness of these policy initiatives, according to data obtained from China's State Administration of Foreign Exchange (SAFE), the share of China's exports settled in renminbi has risen strongly, reaching 50% in 2023, mostly at the expense of the US dollar, whose share declined from 90% to 50% (Figure A.1). At the same time, it is not clear whether the use of the renminbi for trade invoicing has increased as much as it has for trade settlement. In fact, from a theoretical perspective, it is not obvious how settlement currency choice is related to invoicing currency choice. Moreover, even if it may be that settlement currency is a useful proxy for invoicing currency in some countries (as first shown for Sweden by Friberg & Wilander 2008), it is not clear that this also applies to China, where policies have focused specifically on fostering renminbi settlement. The hitherto open question whether settlement currency is a useful proxy for invoicing currency in China's exports was the reason why it was not used in the dataset of Boz et al. (2022).

Our updated and expanded dataset allows us to gauge whether settlement currency is a useful proxy for invoicing currency in China's trade. To do so, we compare renminbi-invoiced imports of all countries in our dataset to China's exports settled in renminbi. The idea is that if settlement currency is a useful proxy for invoicing currency and if renminbi invoicing only occurs in imports from China (see Chowdhry 2024, for evidence consistent with this based on French customs data), then we expect the two figures to be reasonably similar. Note that assuming renminbi invoicing only occurs in imports from China stacks the deck in favor of China's settlement currency being a useful proxy, as it allocates the maximum possible amount of global renminbi import invoicing to imports from China.

Unfortunately, we cannot carry out this check because we do not have renminbi invoicing information for all countries. Therefore, we instead judge whether settlement currency is a useful proxy for invoicing currency for China's trade based on a somewhat weaker plausibility check. In particular, given renminbi-invoiced imports of the countries in our dataset, we ask: How much of the imports of the countries not in our dataset (e.g., Mexico, Vietnam, Pakistan) or countries that are in our dataset but for which we do not have renminbi invoicing information (e.g., India) would have to be invoiced

in renminbi so that global imports match China's exports settled in renminbi? Because we do not have information on invoicing currency at the bilateral trading-partner level, we again assume that renminbi invoicing occurs only in bilateral trade with China. Appendix C provides the details of the calculations.

The intuition of this exercise can be illustrated with a simple back-of-the-envelope calculation for 2023: About 1.5% of total imports of the countries in our dataset are invoiced in renminbi, which amounts to about USD 216 billion. If China's trade settlement currency corresponded to trade invoicing currency, then USD 1,646 billion of China's exports would be invoiced in renminbi. This means that USD 1,430 billion of imports of the countries that are not in our dataset must be invoiced in renminbi. This number seems implausibly large, as it would mean that 104% of their total imports from China (USD 1,373 billion) must be invoiced in renminbi. As a share of their total imports from the world this would be 18%, which is much higher than the 1.5% for the total imports of the countries in our dataset. The left panel in Figure A.2 presents the results for this calculation for every year since 2010.

A related exercise is to ask: What is the implied share of China's exports invoiced in renminbi given the information on renminbi import invoicing for the countries in our dataset? To address this question, we assume that countries not in our dataset invoice the same share of their imports in renminbi as countries in our dataset, and again that renminbi invoicing occurs only in bilateral trade with China. The left panel in Figure 2 shows that the implied share of China's exports invoiced in renminbi is much smaller than the settlement shares provided by SAFE: If renminbi invoicing occurs only in bilateral trade with China and the countries not in our dataset invoice the same share of their imports in renminbi, then 6.5% of China's exports would be invoiced in renminbi, which is much lower than the 50% reported in the SAFE data; the right panel in Figure 2 shows analogous results for renminbi invoicing in China's imports.[3]

Against the background of these considerations, as in Boz et al. (2022) we do not include the SAFE data on trade settlement currency as a proxy for trade invoicing currency in China's trade in our updated and expanded dataset.

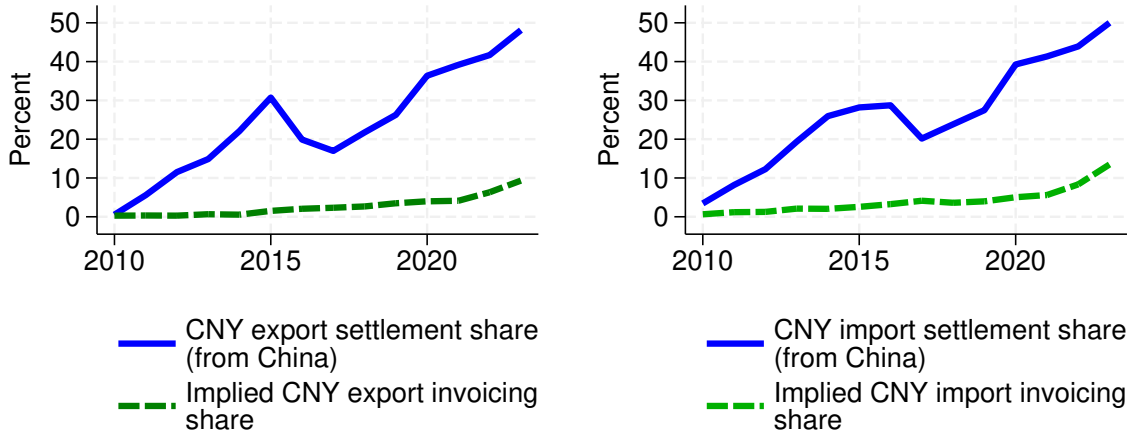
2.5 Country and time-series coverage of the updated and expanded dataset

Our dataset is an unbalanced panel of invoicing currency shares in imports and exports of 132 countries from 1990 to 2023. The invoicing currency shares in general refer to *goods* trade.[4] Figure 3 illustrates

[3] It is worth noting that the rise in the implied renminbi invoicing share since 2010 displayed in Figure 2 is comparable to the rise from 100 to 5000 in the often-cited Standard & Chartered Renminbi Globalization Index (Lau et al. 2012). In contrast, Swift's Renminbi Tracker has increased more slowly from 0.3% in 2012 to 3.5% in May 2025.

[4] Since goods transit through customs, the recording of those transactions is relatively easy compared to services trade. See Amador et al. (2024) and Li & Meleshchuk (2024) for analyses of invoicing currency in services trade.

Figure 2: Implied renminbi invoicing share for China, assuming the renminbi invoicing share for missing countries is identical to that of available countries



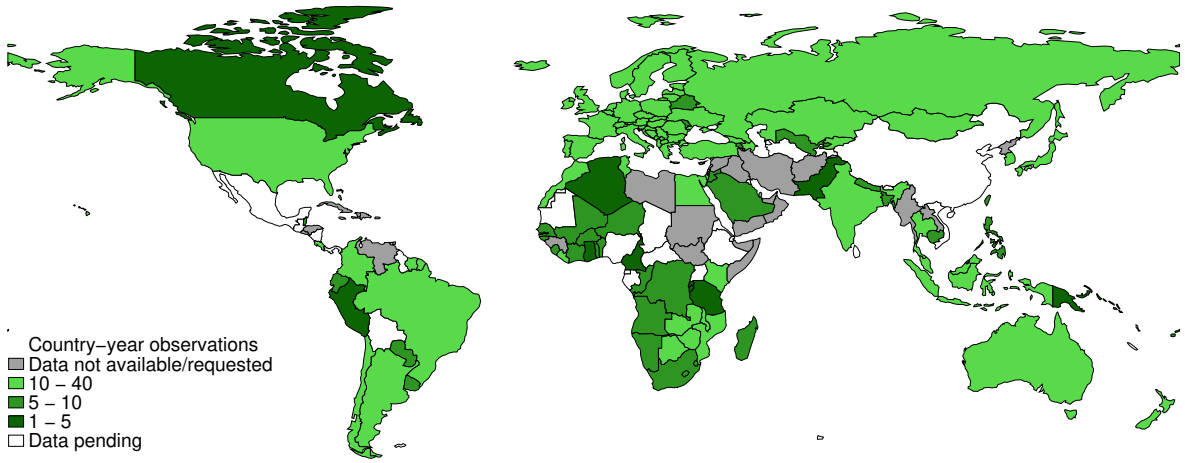
Note: In the left panel the solid blue line depicts the share of China's exports settled in renminbi according to SAFE data. The green dashed line depicts the implied share of China's exports that is invoiced in renminbi under the assumptions that (i) countries not in our dataset invoice as much of their imports in renminbi as the countries in our dataset and (ii) renminbi invoicing occurs only in bilateral trade with China. The right panel shows analogous renminbi settlement and implied renminbi invoicing shares for China's imports.

the country coverage of the dataset for US dollar export invoicing shares. The coverage of euro and renminbi invoicing shares and that of imports is not shown in the figure, but is similar. While our dataset provides information on trade invoicing currency shares primarily for dollar, euro and renminbi, for many countries we also have information on the share of trade invoiced in home currency.

As in Boz et al. (2022), our dataset does not include several important advanced and developing countries for various reasons. First, in some countries customs authorities do not record invoicing currency or do not record it with sufficient accuracy to allow publication and we have not been able to obtain settlement currency information as a proxy (e.g., Hong Kong, Singapore, Mexico).[5] Second, for some countries we are not able to establish contact with the relevant authorities (e.g., Nigeria, Vietnam). For this reason, our dataset does also not include several smaller countries. In particular Central America and Sub-Saharan Africa stand out as regions for which we have relatively limited information. This is an important shortcoming because, for historical reasons, the euro could be playing a leading role as a vehicle currency in some African countries, and because China has been relatively active geoeconomically in many African countries (Horn et al. 2023). Third, for some countries we only have information from Boz et al. (2022) for years prior to 2020, as we are not able to obtain updates (e.g., Ghana, Malawi, Tanzania). Finally, as in Boz et al. (2022), for some countries we have information only for some earlier years and we are unable to obtain more information (e.g.,

[5] In Mexico, disclosure of the invoicing currency is not mandatory in customs declaration. In Hong Kong and Singapore, invoicing currency is not recorded according to local customs authorities.

Figure 3: Country coverage of US dollar export invoicing data



Note: The figure shows the global country coverage of our dataset on dollar export invoicing shares. Different shades of green indicate the number of annual observations available. For the countries marked in black, data are either unavailable (as confirmed by national authorities) or have not been requested. Countries marked in white are those for which data requests are pending. Drawn borders are meant to be illustrational and do not represent official recognition.

Canada, India, Pakistan).[6]

The country coverage of our data set generally improves over time. The maximum country coverage for data on countries' exports invoiced in US dollars in any given year is 121 (in 2022, see Figure A.3). After 2019, two effects on country coverage roughly cancel each other out: On the one hand, invoicing currency information for additional countries relative to Boz et al. (2022) becomes available; on the other hand, we do not have information for 2020-23 for some countries for which there is information prior to 2020 in Boz et al. (2022). The dashed line shows that our data set covers more than half of world exports since the early 2000s and as much as two-thirds of world exports after 2010.

Changes in country coverage over time make it difficult to explore aggregate trends, since time-series variation could reflect countries going in and out of the sample rather than from changes in invoicing currency choices. To remedy this problem, as in Boz et al. (2022), for the analysis of aggregate trends we linearly interpolate between missing observations and backpolate before the first and extrapolate after the last available observation to obtain a balanced panel. For backpolation (extrapolation), we identify the earliest (latest) available observation and assume previous (later) observations had the same value. Note that this simple extrapolation procedure stacks the deck against finding evidence for secular trends in aggregate invoicing currency patterns, such as a rise in renminbi and a decline in dollar invoicing.

After interpolation, backpolation and extrapolation, our dataset covers around 75% of global

[6]Because Canada no longer stores the invoicing currency information used in Devereux et al. (2017), our data is limited to one observation for the year 2001 obtained from Kamps (2006). In the case of India, the technical infrastructure in which the invoicing currency information is stored has changed so that retrieval has become resource intensive, and so we do not have information after 2014. In the case of Pakistan, we are not able to establish contact with authorities, and so the information in our dataset is confined to the data point for the years 2001-2003 provided by Kamps (2006).

exports (right panel in Figure A.3). EU countries account for roughly one-third of the share of global exports covered by our dataset. The evolution of the coverage for the euro and the renminbi as well as for imports is similar.

3 Stylized facts

3.1 The US dollar and the euro

Figure 4 compares the evolution of the share of global exports to the US, the euro area, and all other destinations (left panel) with the share of global exports invoiced in US dollars, euros, and other currencies (right panel).

The top row focuses on dollar and euro invoicing shares as well as export shares to the US and the euro area, and uses the data for all countries in our dataset for which we have information on these invoicing currency shares. As in Gopinath (2015) and Boz et al. (2022), we exclude the US.[7] The vertical lines mark the year 2019, which is when the dataset compiled by Boz et al. (2022) ends. Three observations stand out. First, the combined share of dollar and euro invoicing has remained fairly stable over time. Second, the comparison of the right and left panels illustrates the role of the dollar as the dominant vehicle currency in global trade. The share of exports invoiced in dollars far exceeds the share of exports to the US.[8] In contrast, the share of global exports invoiced in euros is about as large as the share of global exports to the euro area. This is consistent with the euro being used mainly in trade with the euro area, but not as a vehicle currency in third-country trade.[9] Third, there are no significant shifts in dollar and euro invoicing shares at the global level from 2020 to 2023—the four additional years in our dataset compared to that of Boz et al. (2022).

We next exclude euro area countries in addition to the US. Treating the euro area and the US equally facilitates assessing the relative importance of the euro and the dollar as vehicle currencies, as the euro's share in global export invoicing is not inflated by its use in intra-euro area trade. The middle row in Figure 4 shows that when euro area countries and hence intra-euro area trade are excluded,

[7] We account for invoicing in currencies pegged to the dollar or the euro in Figure 4 and the rest of the paper. In particular, we add invoicing in home currency to invoicing in dollar/euro for countries whose currencies are pegged to the dollar/euro. To classify pegs, we proceed as follows. First, we classify a currency as being pegged in a given year if the fine assessment of Ilzetzki et al. (2019) is "1: No separate legal tender or currency union", "2: Pre-announced peg or currency board arrangement", "3: Pre-announced horizontal band that is narrower than or equal to +/-2%", or "4: De facto peg". Then, we classify a currency as having been pegged over our full sample period if it was pegged for every year since 2005 until 2023. The countries in our dataset for which we add home currency to dollar invoicing shares are Bahrain, Brunei Darussalam, Curacao, Jordan, Macao, Maldives, Saudi Arabia and Sint Maarten; except for Saudi Arabia, the home currency shares are low. The countries for which we add home currency to euro invoicing shares are Bosnia and Herzegovina, and the Republic of Congo.

[8] Figure A.4 reveals that the dollar's dominance continues to hold even when commodity exports—conventionally assumed to be invoiced in dollars—are excluded.

[9] Figure A.5 documents that the dominant vehicle-currency role of the dollar for global trade invoicing applies to all countries and not just to a few large exporters, while the euro is indeed used as vehicle currency just by a few countries.

the share of the dollar in global trade becomes an even greater multiple of the share of global exports destined to the US. On the other hand, the share of the euro in trade invoicing is almost halved and euro invoicing is—at best—about as large as non-euro area countries' exports to the euro area. This is consistent with the euro being used mostly for exports of non-euro area countries to the euro area rather than as a vehicle currency in third-country trade. Dropping euro area countries from the sample also reveals that global euro invoicing and exports to the euro area have been converging, indicating an increasing importance of the euro over time. This growth in euro invoicing can be traced to non-euro area European countries (Boz et al. 2022).

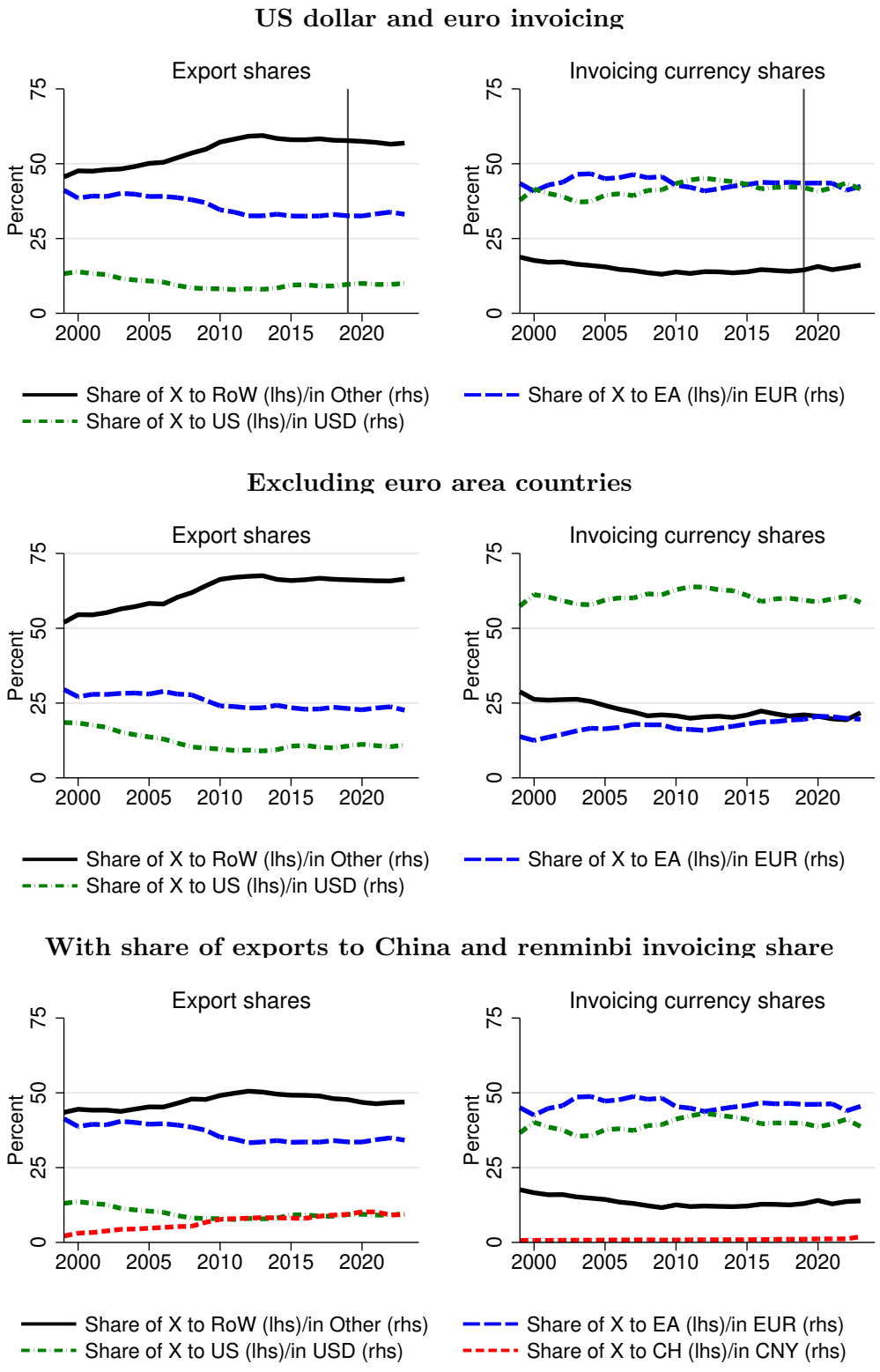
3.2 Enters the renminbi

With our new dataset we can assess developments in renminbi invoicing for a comprehensive sample of countries for the first time.[10] The bottom row in Figure 4 plots the evolution of global export and invoicing currency shares, now isolating exports to China from other destinations and the reminbi from other currencies. We reintroduce euro area countries because we have a lot of information on renminbi invoicing patterns for them; Figure A.6 is the analogue of the bottom row in Figure 4 but without euro area countries. We only include countries for which we have information on dollar, euro and renminbi invoicing shares. The left panel reveals that the share of global exports to China has increased strongly since 2000, and is now comparable to the share of exports to the US. However, the share of global exports invoiced in renminbi is hardly visible when assessed on the same scale as the dollar and the euro.

Figure 5 zooms in on the evolution of the share of global exports to China and invoiced in renminbi, respectively. Here we use the raw rather than the inter/extrapolated renminbi invoicing shares as in Figure 4, because especially backpolation would lead us to understate very recent and strong growth in renminbi invoicing; for consistency with Figure 4, Figure A.7 is drawn with inter/extrapolated data. The left panel in Figure 5 shows that China has become an increasingly important export market for countries in all regions, especially in Asia, Africa, and Latin America. The right panel illustrates that while renminbi invoicing was hardly visible even at this smaller scale until 2010, since then it has increased across countries in most regions, particularly in Asia and more recently also in Europe and Latin America. At the same time, despite this recent strong increase in renminbi invoicing, it remains below the share of global exports to China. Figure A.7 documents that the conclusions from zooming on renminbi invoicing across regions are very similar when looking at unweighted averages across countries as well as when excluding euro area countries or Russia.

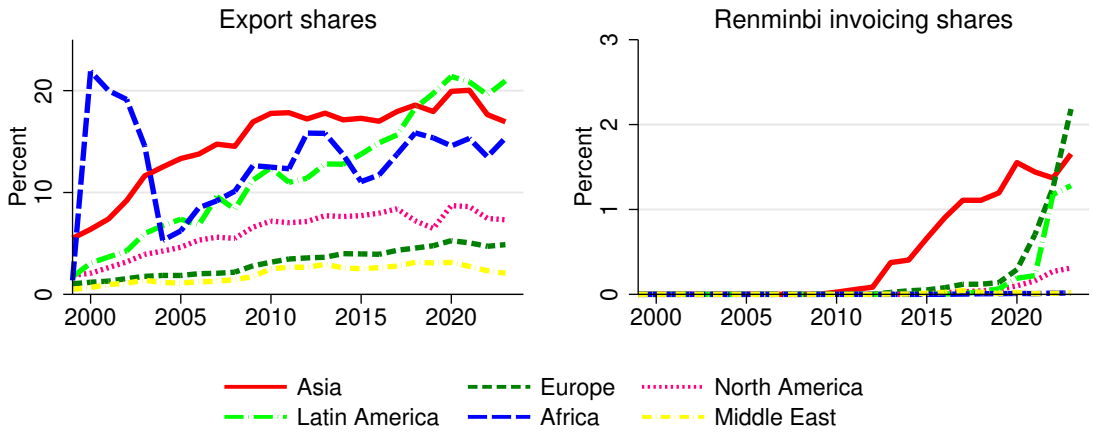
[10] Georgiadis et al. (2021) use renminbi invoicing information for a much smaller number of countries and time periods received in the data collection of Boz et al. (2022) by some national authorities even though it was not requested.

Figure 4: Global trade and invoicing currency shares over time



Note: The left panels depict the evolution of the share of exports to the US, the euro area, the rest of the world, and in the last row also to China in total global exports. The right panels depict the share of global exports that are invoiced in dollar, euro, other currencies, and in the last row in renminbi. In the first row we include all countries for which we have information on dollar and euro export invoicing shares in our dataset except for the US (as in Gopinath 2015, Boz et al. 2022), in the second row we exclude euro area countries, and in the last row we include all countries for which we have information on dollar, euro and renminbi export invoicing shares in our dataset. The graphs are based on interpolated and extrapolated data.

Figure 5: Zooming in on exports to China and renminbi invoicing



Note: The left panel depicts the share of a region's total exports that is destined to China. The data are from the IMF Direction of Trade Statistics; we only include countries for which we have renminbi invoicing currency information in our dataset. The right panel shows the share of a region's total exports that is invoiced in renminbi. We use the raw renminbi invoicing shares rather than inter/extrapolated data as in Figure 4. The large increase in Africa's share of exports to China in the early 2000s is due to Angola.

4 Invoicing currency patterns and geopolitics

4.1 Theoretical considerations and existing empirical evidence

Standard models emphasize *inter alia* the role of exogenously given export patterns, input-output linkages, and competition with foreign and local producers in destination markets as determinants of exporters' choice of invoicing currency (see, for instance, Engel 2006, Gopinath et al. 2010, Mukhin 2022). The intuition is that exporters choose the currency in which their optimal price is expected to be most stable—that is, deviations of optimal re-set from optimal pre-set prices are least volatile—considering future shocks to demand and input costs. Against this background, shifts in geopolitical alignment may influence country-level invoicing currency patterns through changes in export patterns, intermediate input import patterns, and currency choice in other contexts.

First, tariffs, subsidies, moral suasion, or outright trade sanctions imposed for geopolitical reasons can alter export and thereby invoicing currency patterns. For instance, a country may redirect exports previously destined for the US and invoiced in US dollars toward the euro area and invoice in euros. At the country level, such a shift may reflect either a reorientation of individual firms' export destinations or a relative decline in the growth of firms exporting to the US and invoicing in dollars compared to those exporting to the euro area and invoicing in euros. This channel may be particularly empirically relevant recently given new trends in trade fragmentation associated with geopolitical realignments (European Central Bank 2023, Bonadio et al. 2024, Gopinath et al. 2025*a*). In the regressions below, we control for the share of a country's exports destined for issuers of invoicing currencies to account for changes in invoicing patterns that are mechanically driven by shifts in export-partner composition.

Second, trade barriers motivated by geopolitical considerations may influence export invoicing currency patterns even when export destinations do not change. This can occur through the marginal cost channel, as such barriers may prompt a reconfiguration of globally integrated value chains into more fragmented, regionally aligned blocs in a process of "friend-shoring" (for evidence see, e.g., European Central Bank 2023, Gopinath et al. 2025*b*). For example, a country may replace intermediate inputs imported from the US and invoiced in dollars with inputs from the euro area invoiced in euros. This substitution strengthens the incentive to invoice exports in euros, as it reduces the volatility of desired prices stemming from exchange rate fluctuations. At the country level, this shift may again reflect either firm-level substitution of intermediate input sources and corresponding invoicing practices, or differential growth between firms that rely on US inputs and dollar invoicing and those that source from the euro area and invoice in euros. Geopolitical realignment might also affect invoicing currency patterns through "re-shoring" of value chains, and also when domestic firms reduce their dependence on imported inputs through innovation (Alfaro et al. 2025, Flynn et al. 2025).

Third, geopolitics may influence invoicing currency patterns through spillovers from currency choice in other contexts. For example, theory highlights complementarities between trade invoicing currency and safe asset currency (Gopinath & Stein 2021, Chahrour & Valchev 2022). In particular, as central banks rebalance their foreign exchange reserves towards assets denominated in currencies of geopolitically aligned countries (OMFIF 2024), complementarities may favor analogous switches in trade invoicing currency. Complementarities with trade invoicing currency choice may also exist in other contexts that have so far been studied less in the literature but are increasingly salient in policy discussions. One example is the choice of trade settlement currency. In fact, Berthou (2023), Chupilkin et al. (2023) and Corsetti et al. (2024) point to the increase in direct and indirect costs for cross-border payments—such as punitive measures and penalties associated with sanctions—as a key reason for their finding of reduced dollar trade invoicing in trade with Russia.

We next utilize our new dataset to explore the relationship between geopolitics and trade invoicing currency patterns at the global level.

4.2 Invoicing currencies and geopolitical alignment

We start by presenting long-term trends in global trade by invoicing currency *and* geopolitical alignment. Following Gopinath et al. (2025*a*) and Trebesch et al. (2025), we measure geopolitical alignment using the ideal point distance metric developed by Bailey et al. (2017) based on voting patterns in the United Nations (UN) General Assembly.[11] As in Gopinath et al. (2025*a*), we define the upper (lower)

[11] Bailey et al. (2017) use statistical models derived from item response theory to estimate one-dimensional state preferences that are comparable over time based on votes in the UN General Assembly. In particular, they use a dynamic ordinal spatial model to estimate state ideal points on a single political ideology dimension that reflects state

25% percentile in the distribution of the distance to the US in 2023 across the countries in our dataset as *US most-aligned* and *US least-aligned* countries, respectively.[12] In addition to US most-aligned and least-aligned country groups there is a *US neutral* group that accounts for 50% of the countries in our dataset. With this classification, 34% of world exports in our country sample originate from US most-aligned countries, 8% from US least-aligned countries, 9% from the US itself, and 49% from US neutral countries.

The panels in the top row of Figure 6 illustrate the evolution of world exports invoiced in dollars for US most-aligned (blue line, filled square markers) and US least-aligned (green line, hollow square markers) countries. The difference in the left and right panels is the choice of denominator: the left panel expresses dollar-invoiced exports as a share of total exports from the respective country group (i.e., US most-aligned or US least-aligned), while the right panel uses total world exports as denominator. In both panels, the lines with circle markers represent the corresponding shares of exports destined for the US.

Three observations stand out. First, the top left panel reveals that a significantly larger share of total exports is invoiced in dollars in US least-aligned (green line, hollow square markers) compared to US most-aligned (blue line, filled square markers) countries, despite both groups exhibiting similar shares of exports to the US (circle markers). This finding suggests that the dollar plays a more prominent role as a vehicle currency in US least-aligned countries. It is also noteworthy that US least-aligned countries are predominantly emerging market and developing economies, which tend to invoice in dollars more frequently than advanced economies. Since using an invoicing currency may be more readily abandoned in third-country trade than in bilateral trade with the currency issuer (Mukhin 2022), this finding suggests that there is greater potential for a shift away from the dollar towards a challenger currency in US least-aligned countries. That said, structural factors may make it less likely that US least-aligned countries can reduce their reliance on the dollar for invoicing in practice.

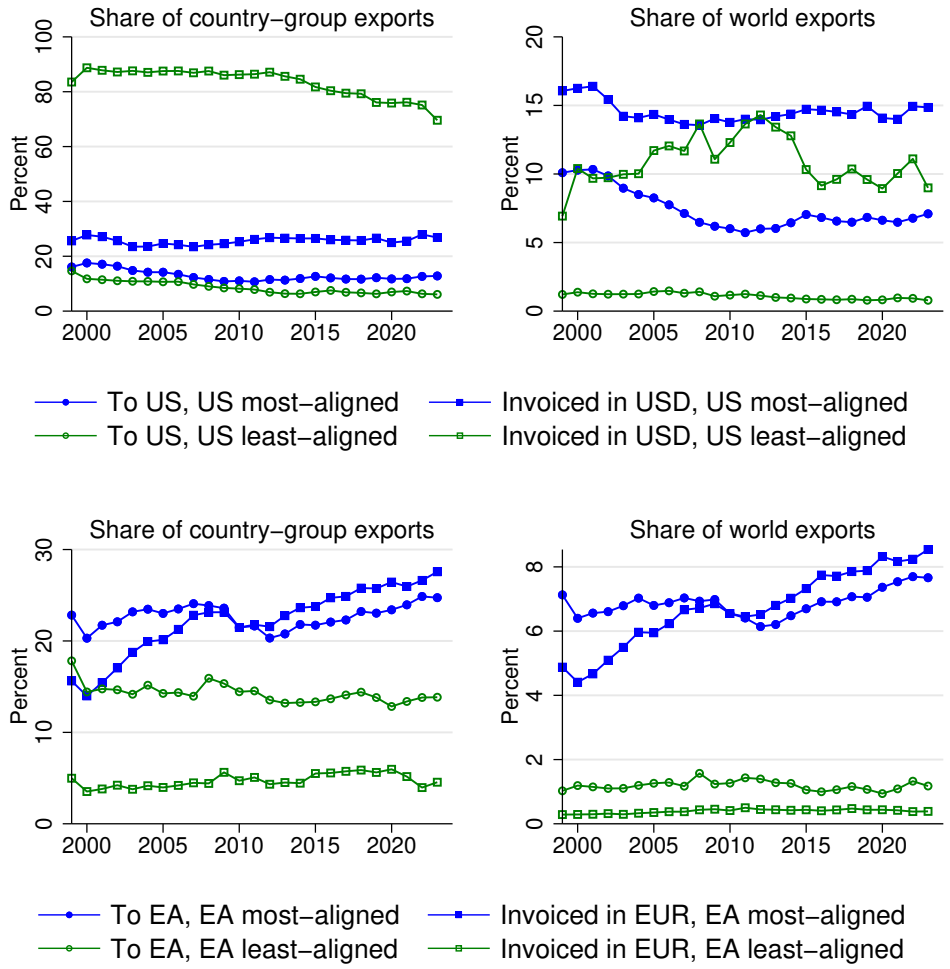
Second, the right panel—examining the same invoicing currency data as the left panel but using world exports as denominator—confirms the more prominent role of the dollar as a vehicle currency in trade of US least-aligned compared to US most-aligned countries. The panel shows that US most-aligned countries account for a larger share of world exports invoiced in dollars than US least-aligned countries (square markers). At the same time, comparing the share of exports invoiced in dollars (square markers) with the share of exports destined for the US (circle markers) shows that US least-

preferences towards a US-led liberal order. They use resolutions that are identical over time to account for agenda change and thereby make state ideal point estimates comparable over time.

[12] While the classification approach of Bailey et al. (2017) does not necessarily imply that US least-aligned countries are aligned with China, empirical evidence suggests that this is often the case.

aligned countries (green lines, hollow markers) still rely on the dollar as a vehicle currency to a much greater extent than US most-aligned countries (blue lines, filled markers) also when invoicing shares are calculated relative to total world rather than country-group exports.

Figure 6: Exports by destination and invoicing currency split by geopolitical alignment



Note: The panels in the top row depict the share of exports invoiced in dollars (square markers) and destined to the US (circle markers), respectively, by US most-aligned (blue lines, filled markers) and US least-aligned (green lines, hollow markers) countries in our dataset. The left panel uses as denominator in the export share calculation US most-aligned and US least-aligned country-group total exports, respectively, while the right panel uses total exports of all countries. We define the upper (lower) 25% percentile in the cross-country distribution of difference between a country's and the US ideal point estimate of Bailey et al. (2017) based on UN General Assembly voting patterns as US most-aligned (least-aligned) countries. The panels in the bottom row present analogues for exports to the euro area and exports invoiced in euros, by geopolitical alignment with the euro area (based on the average geopolitical distance across euro area countries).

Third, both panels suggest that dollar-invoiced trade has declined since the early 2010s in US least-aligned countries (green line, hollow square markers), while it has been stable in US most-aligned countries (blue line, filled square markers). Although exports from least-aligned countries to the US have also experienced a secular decline (green line, hollow circle markers), the magnitude of this decline has been smaller than the decline in their dollar invoicing (green line, hollow square markers). This supports the view that the observed decline in dollar-invoiced trade since the early

2010s in US least-aligned countries primarily reflects a reduction in a vehicle-currency-invoiced trade.

The panels in the bottom row of Figure 6 present analogous charts for the euro. Again three observations stand out, all in contrast to the dollar. First, the share of exports invoiced in euros (square markers) is substantially lower in euro area least-aligned countries than euro area most-aligned countries. Second, comparing the share of exports invoiced in euros (square markers) with the share of exports destined for the euro area (circle markers) suggests that the euro plays no role as an invoicing—let alone as vehicle—currency in euro area least-aligned countries.[13] Third, the share of exports invoiced in euros in euro area most-aligned countries (blue line, filled square markers) has been increasing, until around 2010 even faster than the corresponding share of exports (blue line, filled circle markers). This is again consistent with an increasing use of the euro in euro area and European Union neighboring countries (Boz et al. 2022).

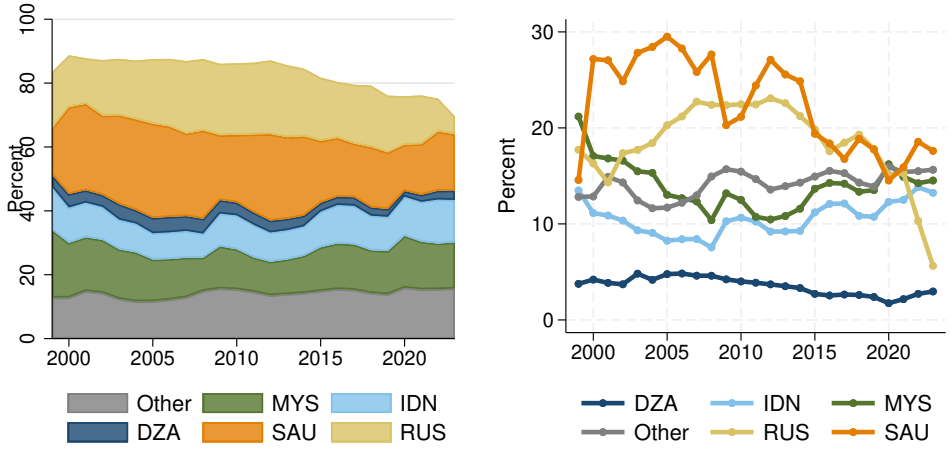
Next, we return to the dollar and unpack the developments shown in the top-left panel of Figure 6. To do so, we plot the share of exports invoiced in dollars over time for individual US least-aligned countries. Figure 7 presents this decomposition for the five largest contributors. The left panel shows each country's contribution to the overall share of exports invoiced in dollars in this group in terms of stacked shares, while the right panel plots the unstacked shares for each country. As shown in Figure 7, the decline in the group's dollar invoicing share shown by the green dashed line in the top left panel in Figure 6 is driven primarily by Russia and Saudi Arabia.[14] In the following subsection, we use regression analysis in order to explore further the role of developments in commodity trade and geopolitical alignment for the decline in dollar invoicing.

It is also insightful to explore renminbi invoicing developments by geopolitical alignment. Figure 8 shows the evolution of the share of country-group imports from China and imports invoiced in renminbi by geopolitical alignment with the US. We consider imports rather than exports here because we have more and longer invoicing currency data than for exports, especially for some key countries like Russia; Figure A.9 shows that patterns are similar however when considering exports. The left panel shows that China has been gaining importance as an import source, especially for US least-aligned countries. The divergence between US most-aligned and least-aligned countries has grown after the recovery from the disproportionate drop in trade with China during the COVID-19 pandemic in 2020 and Russia's invasion of Ukraine in 2022. The right panel shows that renminbi invoicing has taken off in US least-aligned countries, while the increase in US most-aligned countries has been modest, and has even reversed since Russia's invasion of Ukraine in 2022. While the divergence in both import shares to China and renminbi invoicing shares are particularly stark when Russia is included

[13] In line with this, Beck et al. (2025) document that foreign euro area government debt is disproportionately held by euro area aligned countries.

[14] Figure A.8 presents the analogous decomposition for the top-right panel of Figure 6.

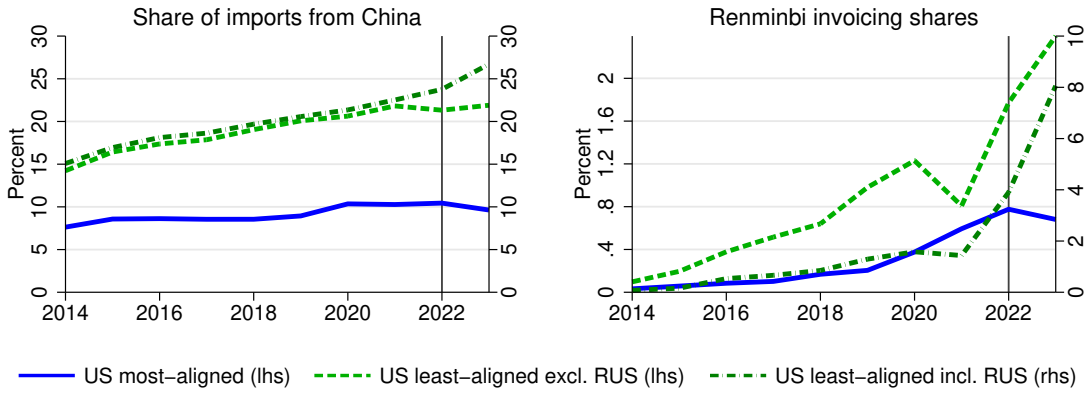
Figure 7: Decomposition of the evolution of the share of country-group exports by US least-aligned countries invoiced in dollars



Note: The figure presents a decomposition of the evolution of the share of country-group exports invoiced in dollars by US least-aligned countries over time shown in the top left-hand side panel in Figure 6 by country. The right-hand side panel shows the share of country-group exports invoiced in dollar by these countries, while the left-hand side panel stacks them.

in the US least-aligned country group (green dash-dotted lines, right-hand side axis), it is still clearly visible when Russia is dropped (green dashed lines, left-hand side axis). Figure A.10 decomposes the growth in renminbi invoicing at the US most-aligned and least-aligned country-group level into the largest contributions by individual countries, showing that among US most-aligned (least-aligned) countries the increase in country-group imports from China invoiced in renminbi has been mostly due to European (Asian) countries.

Figure 8: Imports from China and renminbi invoicing by geopolitical alignment with US



Note: The left panel depicts the share of total country-group imports that is destined to China; we only include countries for which we have renminbi invoicing currency information in our dataset. The right panel shows the share of total country-group imports that is invoiced in renminbi. We use the raw renminbi invoicing shares rather than inter/extrapolated data. The vertical lines indicate 2022.

The key takeaways from this subsection are five. First, US least-aligned countries tend to invoice a larger share of their exports in dollars compared to US most-aligned countries. Second, because US least-aligned countries account for a smaller share of global trade, the value of their exports invoiced

in dollars remains lower than that of US most-aligned countries. Third, while the share of exports by US least-aligned countries invoiced in dollars has been declining since the early 2010s, this long-term trend has not been broad-based and has been driven primarily by Russia and Saudi Arabia. Fourth, in contrast to the dollar, euro invoicing in global exports is predominantly by euro area most-aligned countries. Fifth, trade with China and renminbi invoicing have been growing faster for US least-aligned countries since 2014, and at least since 2021 not only due to Russia.

We next examine how invoicing currency shares and geopolitical distance have evolved at the country level. We explore in particular whether the role of geopolitics has broadened to other countries beyond Russia and Saudi Arabia since the invasion of Ukraine in 2022.

4.3 Changes in invoicing currency patterns and geopolitical distance

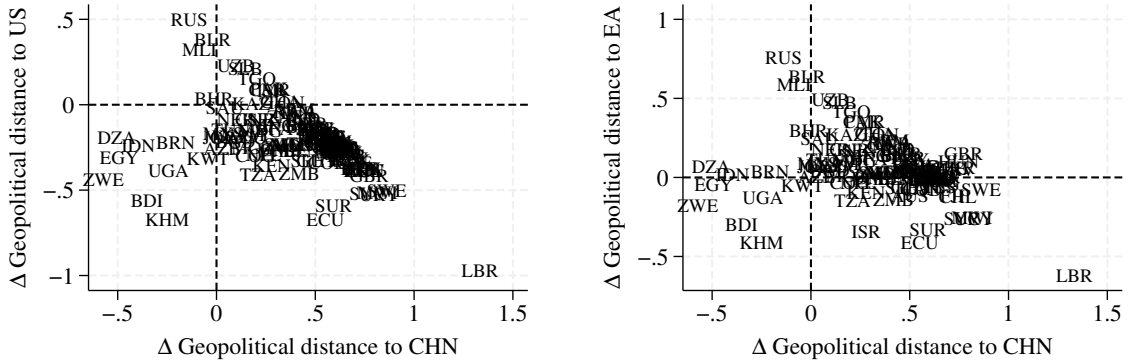
We first present some evidence for changes in geopolitical alignments over time. Figure 9 shows changes in bilateral geopolitical distance between 2015-19 and 2022-23, with the latter capturing the period after Russia's invasion of Ukraine. We now use the continuous geopolitical distance measure of Bailey et al. (2017) rather than categorizing countries into most and least-aligned groups. The left (right) panel compares changes in countries' geopolitical distance to the US (euro area) and China, respectively. In each panel, countries in the bottom right quadrant have become more geopolitically distant from China and closer to the US or the euro area. Conversely, countries in the top left quadrant have moved closer to China, while becoming more distant from the US or the euro area.[15]

Figure 9 highlights notable shifts in global geopolitical alignments before and after Russia's invasion of Ukraine. First, the majority of countries in our dataset have moved closer geopolitically to the US and away from China, as indicated by their position in the bottom-right quadrant of the left panel. Second, a small group of countries in the top-left quadrant—including Russia and Belarus—have become more distant from the US and moved closer to China. Third, looking at both panels together suggests that among the countries that have moved closer to the US and become more distant from China, most have also become more geopolitically distant from the euro area. Note that most countries that have moved closer to the US have in fact distanced themselves from the euro area (Figure A.14). Only few countries—among which Russia, Belarus, Kazakhstan, Uzbekistan and Mali—have distanced themselves from both the US and the euro area.

Next we connect changes in geopolitical alignments with changes in invoicing currency patterns.

[15] Figure A.12 presents the cross-country distribution of geopolitical distance to the US and China in 2013 before Russia's invasion of Crimea and in 2023 after its invasion of Ukraine. The growing geopolitical fragmentation—particularly after 2022—is evident in the widening distance between the two clusters of countries in terms of their geopolitical proximity to the US and China, respectively. Similarly, Figure A.13 shows that countries have increasingly clustered in terms of geopolitical distance around the US and China, respectively, between 2013 and 2023. Fernandez-Villaverde et al. (2024) build a global geoeconomic fragmentation index based on a dynamic hierarchical factor model and show that it has been rising since the Global Financial Crisis, especially for the sub-component of political fragmentation.

Figure 9: Changes in bilateral geopolitical distances between 2015-19 and 2022-23



Note: The figure shows changes in bilateral geopolitical distances between 2015-19 and 2022-23 for the countries in our dataset. Geopolitical distance is measured based on the ideal point distance of Bailey et al. (2017) and voting patterns in the UN General Assembly. In both panels, the horizontal axis depicts changes in geopolitical distance to China. In the left (right) panel the vertical axis depicts changes in geopolitical distance to the US (euro area). Geopolitical distance to the euro area is measured as the unweighted average of distances to individual euro area countries. We drop euro area countries in the left panel.

The left panel in Figure 10 shows that Kyrgyzstan, Russia, Belarus, and Uzbekistan experienced the largest declines in the share of exports invoiced in dollars in 2022-23 relative to the 2015-19 average.[16] The right panel compares changes in the share of exports invoiced in dollars with changes in geopolitical distance from the US across the full country sample. Overall, the figure reveals a negative association between geopolitical distancing from the US and the use of the dollar in export invoicing. Consistent with the left panel, Russia, Belarus, Kyrgyzstan, and Uzbekistan stand out as countries exhibiting particularly large shifts in both dimensions.

However, what cannot be inferred from Figure 10 is the extent to which the observed decline in dollar invoicing reflects geopolitical considerations beyond bilateral trade patterns, as discussed in Section 4.1.

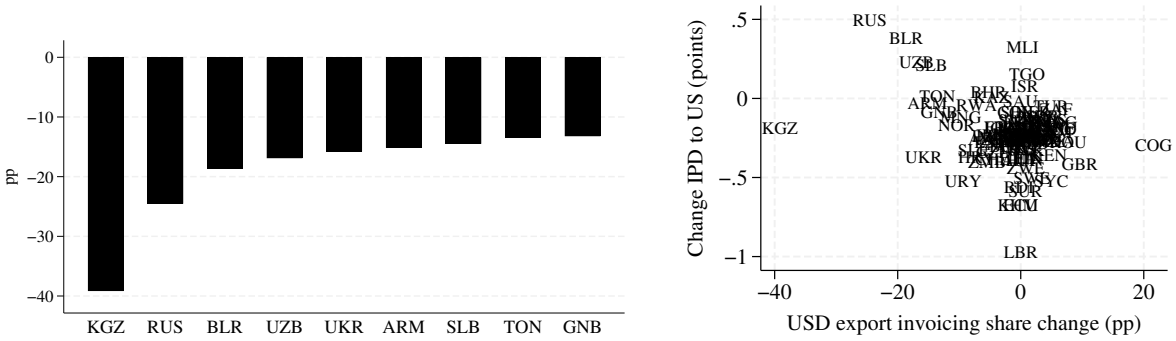
An illustrative example of the difficulty to distinguish between the different margins of adjustment at the country level is again Russia. In particular, Figure 11 shows that changes in renminbi and euro invoicing shares closely track shifts in bilateral trade shares.[17] The figure suggests that the rise in renminbi invoicing in Russia primarily reflects a reorientation of imports being sourced from China and these being invoiced in renminbi. Conversely, the decline in euro invoicing corresponds to a reduction in euro-invoiced trade with the euro area.

Against this background, we next explore whether trade invoicing currency patterns across the

[16] Due to data limitations, for Russia, Belarus, Kazakhstan and Kyrgyzstan we use trade settlement rather than invoicing currency shares. As highlighted in the case of China in Section 2.4, this distinction may be important. This distinction may also be important in the case of Russia, as there is evidence that the Central Bank of Russia drew from its swap line with the PBoC to provide renminbi liquidity to domestic banks so they could pay for imports from China and preserve dollar reserves (see Horn et al. 2023, Chupilkin et al. 2023). However, a comparison between Russia's trade settlement currency data from the Central Bank of Russia with trade invoicing currency data from Russia's customs, as used in Chupilkin et al. (2023) and shown in Figure A.11, suggests that the two series are either very similar or at least follow comparable trends over time for the dollar, euro and renminbi.

[17] We focus on imports in this example due to the availability of a longer time series for renminbi invoicing shares.

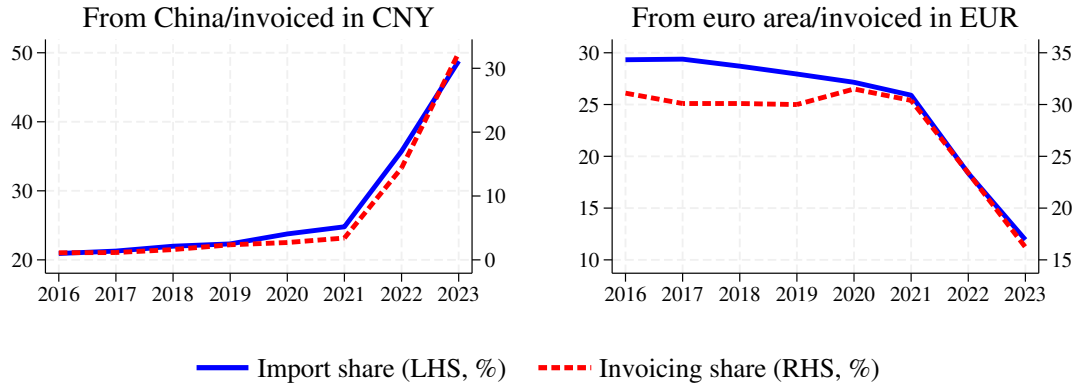
Figure 10: Changes in dollar export invoicing currency shares between 2015-19 and 2022-23 and changes in geopolitical distance to the US



Note: The left panel shows the countries with the largest drops in dollar export invoicing currency shares in 2022-23 relative to the average over 2015-19. The right panel compares the changes in the share of exports invoiced in dollar to changes in geopolitical distance to the US for all countries. Geopolitical distance is measured based on the ideal point distance of Bailey et al. (2017) and voting patterns in the UN General Assembly.

countries in our dataset have shifted beyond compositional effects—that is independently from any reallocation of trade flows following Russia's invasion of Ukraine.

Figure 11: Changes in invoicing currency and bilateral trade shares for Russia



Note: The blue solid lines depict the share of Russia's imports sourced from China (left panel) and the euro area (right panel). The data are taken from the IMF Direction of Trade Statistics. The red dashed line depicts the share of Russia's imports invoiced in renminbi (left panel) and euro (right panel). We use information on settlement currency as a proxy for invoicing currency. Comparing Russia's trade settlement currency data with trade invoicing currency data from Russia's customs used in Chupilkin et al. (2023) in Figure A.11 suggests that trade settlement currency is a useful proxy for trade invoicing currency for the euro and renminbi.

4.4 Evidence from panel regressions

We use panel regressions to estimate correlations between geopolitical distance and invoicing currency shares while controlling for compositional factors. Following Novy (2006), Goldberg & Tille (2008), Ito & Chinn (2014) as well as Georgiadis et al. (2021), we estimate:

$$s^c_{e,t} = \rho^c s^c_{e,t-1} + \boldsymbol{\beta}^{c\prime} \boldsymbol{w}^c_{e,t} + \alpha^c_e + \tau^c_t + u^c_{e,t}, \tag{1}$$

where $s^c_{e,t}$ denotes the share of exporter e's exports in period t invoiced in currency $c \in \{\$, €, ¥\}$, $\boldsymbol{w}^c_{e,t}$ a vector of control variables specified below, and α^c_e and τ^c_t exporter and time fixed effects, respectively.[18] We include the lagged dependent variable $s^c_{e,t-1}$ to mitigate concerns of spurious regression, given the persistence of invoicing currency shares in many countries. Note that the dependent variable, the export invoicing currency share $s^c_{e,t}$, refers to the share of total exports invoiced in each currency, as bilateral invoicing data is not available.

The vector of control variables, $\boldsymbol{w}^c_{e,t}$, includes the share of exporter e's exports destined for the issuer of currency $c \in \{\$, €, ¥\}$, that is, the share of exports to the US, the euro area, or China, respectively. We also include the share of exporter e's exports to economies that peg their currencies to the issuer of currency $c \in \{\$, €, ¥\}$; for the renminbi we use the share of trade with ASEAN countries.[19]

Second, $\boldsymbol{w}^c_{e,t}$ includes measures that capture the extent to which a country's exports consist of relatively homogeneous goods that are typically priced on organized exchanges or based on reference prices and invoiced in dollars (McLeay & Tenreyro forthcoming). To account for this, we use two indicators. The first is the share of a country's exports accounted for by fuel, ores and metals, and agricultural raw materials, as reported in the World Bank's World Development Indicators. The second indicator we use is the share of exports accounted for by oil, based on data from the IMF's World Economic Outlook Database. While the broader commodity export share is generally the preferred measure for capturing trade in homogeneous goods, because of data gaps for key US least-aligned exporters we run all regressions with the oil export share as an alternative. Specifically, data for the commodity export share are missing for Algeria since 2018, for Saudi Arabia in 2017 and 2023, for Bahrain in 2021 and 2023, for Russia after 2022, and for Belarus after 2021.

Third, we include in $\boldsymbol{w}^c_{e,t}$ the bilateral exchange rate between exporter e's currency and the dollar, the euro, or the renminbi to account for within-country variation in invoicing currency shares driven by mechanical valuation effects.[20] We use nominal bilateral exchange rate data from the IMF's International Financial Statistics. Mechanical effects that are common across countries—such as fluctuations in US dollar-denominated commodity prices—are absorbed by the time fixed effects. [21]

[18] Logit or probit fractional regressions as proposed by Papke & Wooldridge (1996) would account for the fact that invoicing shares are bounded by $[0, 1]$. However, it is well known that in non-linear panel data models incidental parameter problems due to fixed effects are more acute.

[19] We consider economies anchoring their currencies to the dollar or the euro when their exchange rate is not a "free float" and the corresponding "anchor currency" is the dollar, the euro or the renminbi according to Ilzetzki et al. (2019).

[20] To compute invoicing currency shares, export values denominated in foreign currencies must be converted into a common currency. If, for instance, shares are calculated based on export values converted into the exporter's domestic currency, an appreciation of the dollar against that currency mechanically increases the share of exports invoiced in dollars, even if trade volumes remain unchanged.

[21] Ideally, we would control for country-specific commodity price indices, as export bundles differ across countries. However, such data are not readily available. Juvenal & Petrella (2024) construct country-specific indices using sectoral export shares, global commodity prices, and disaggregated US producer price indices, but their sample covers less than

For the regression analysis we focus on the sample period from 1999-2023. To regularize the data, we exclude observations when the first difference over time falls below the 1^{st} percentile or exceeds the 99^{th} percentile. Table 1 reports summary statistics.

Table 1: Summary statistics

	mean	min	p5	p50	p95	max	sd	count
USD invoicing share	49.15	0.45	5.96	42.96	98.61	100.00	33.33	1,307
EUR invoicing share	41.24	0.00	0.29	39.44	91.94	99.46	35.26	1,303
CNY invoicing share	0.25	0.00	0.00	0.00	1.17	29.32	1.40	704
Share of trade with US	7.63	0.00	0.45	4.59	27.73	44.73	8.41	1,307
Share of trade with euro area	34.65	0.05	3.04	38.43	67.59	80.68	21.71	1,303
Share of trade with China	7.24	0.00	0.21	2.57	26.52	92.60	10.36	704
Share of trade with USD block (excl. China)	18.23	0.49	2.48	13.23	44.49	82.34	14.50	1,307
Share of trade with EUR block	11.19	0.00	0.73	8.44	30.50	83.40	11.11	1,303
Share of trade with ASEAN countries	4.42	0.00	0.09	1.37	20.38	57.08	7.25	704
Commodity trade share	23.40	0.02	2.87	14.04	74.80	98.58	22.69	1,250
Oil trade share	6.38	0.00	0.00	2.22	34.30	55.58	10.18	1,307
Bilateral exchange USD exchange rate (log)	440.52	111.37	366.41	449.91	476.33	498.24	39.29	1,307
Bilateral exchange EUR exchange rate (log)	446.33	104.41	374.18	460.49	480.86	607.15	37.81	1,303
Bilateral exchange CNY exchange rate (log)	418.04	94.33	335.11	430.00	462.53	485.69	41.15	704
IPD to US	2.19	0.10	1.21	1.87	3.40	4.18	0.79	1,307
IPD to euro area	0.73	0.08	0.11	0.33	1.82	2.50	0.66	1,303
IPD to China	1.13	0.00	0.07	1.25	2.37	3.37	0.77	704
IPD to US in 2023	1.95	0.22	1.00	1.61	3.21	3.76	0.83	1,307
IPD to euro area in 2023	0.77	0.15	0.16	0.34	1.83	2.41	0.66	1,303
IPD to China in 2023	1.35	0.01	0.18	1.69	2.31	3.08	0.83	704

Note: The table reports summary statistics of the variables used in the regression of Equation (1) and extensions thereof. For regressions in which the dollar export invoicing share is the dependent variable, we additionally report summary statistics for the oil and commodity export share variables, based on the subset of observations included in those specifications.

Table 2 presents results from estimating the regression specified in Equation (1), run separately for each invoicing currency $c \in \{\$, €, ¥\}$. Inference is based on Driscoll-Kraay standard errors robust to serial correlation and cross-section dependence. Among the compositional and mechanical correlates of export invoicing currencies, bilateral trade with the invoicing currency issuer and commodity/oil trade stand out; the latter is consistent with the prominent role of dollar invoicing in commodities trade documented McLeay & Tenreyro (forthcoming). First, the share of exports destined for the invoicing currency issuer is positively correlated with the share of exports invoiced in that currency. The estimated coefficients are largest for the dollar, smaller for the euro and smallest for the renminbi—consistent with the relative prominence of these currencies in global trade. Second, the share of exports accounted for by commodities or oil is positively correlated with dollar invoicing, but negatively correlated with invoicing in euros and renminbi. This finding is consistent with the conventional wisdom that commodities and oil are predominantly invoiced in dollars. Table B.1 documents that results are similar when using *import* invoicing currency shares as the dependent variable. In the remainder of the analysis, we only report coefficient estimates for commodity and oil export share variables to save space.[22]

half of the countries in our dataset.

[22]Table B.2 reports results from pooled exporter-invoicing currency panel regressions

$$s_{e,c,t} = \rho s_{e,c,t-1} + \boldsymbol{\beta}' \boldsymbol{w}_{e,c,t} + \boldsymbol{\gamma}' \boldsymbol{z}_{e,c,t} + \gamma_{c,t} + u_{e,c,t}. \tag{2}$$

Table 2: Panel regressions for compositional/mechanical correlates of export invoicing shares

	USD		EUR		CNY	
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged invoicing currency share	0.73***	0.75***	0.80***	0.80***	0.92***	1.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Bilateral trade share with invoicing currency issuer	0.11***	0.06*	0.08***	0.09***	0.01***	0.01***
	(0.00)	(0.07)	(0.00)	(0.00)	(0.00)	(0.00)
Trade share with rest of invoicing currency block	0.02	0.06**	0.03	0.03	0.01**	0.01*
	(0.53)	(0.04)	(0.23)	(0.24)	(0.02)	(0.06)
Bilateral exchange rate against invoicing currency	-0.00	0.00	-0.01**	-0.00	0.00**	0.00*
	(0.87)	(0.97)	(0.03)	(0.29)	(0.04)	(0.08)
Commodity trade share	0.09***		-0.04**		-0.00	
	(0.00)		(0.04)		(0.74)	
Oil trade share		0.17***		-0.16***		-0.01**
		(0.01)		(0.00)		(0.04)
Year FEs	✓	✓	✓	✓	✓	✓
Within R-squared	0.65	0.65	0.77	0.78	0.80	0.96
Observations	1298	1307	1322	1321	724	712
Countries	114	111	113	111	91	89

Note: The table reports results from regressions of Equation (1). In columns (1) and (2) we report results for US dollar export invoicing shares, in columns (3) and (4) for euro invoicing export invoicing shares, and in columns (5) and (6) for renminbi invoicing shares. Columns (1), (3) and (5) control for the commodity export share, and columns (2), (4) and (6) for the oil export share. See Table B.1 for analogous results for import invoicing currency shares. Inference is based on Driscoll-Kraay standard errors.

We next estimate an extension of Equation (1):

$$s^c_{e,t} = \rho^c s^c_{e,t-1} + \boldsymbol{\beta}^{c\prime}\boldsymbol{w}^c_{e,t} + \delta^c geopdist^{i(c)}_{e,t} + \gamma^c[geopdist^{i(c)}_{e,t} \times \mathcal{I}(t > 2021)] + \alpha^c_e + \tau^c_t + u^c_{e,t}, \quad (3)$$

where $geopdist^{i(c)}_{e,t}$ denotes economy e's geopolitical distance from the invoicing currency issuer $i(c)$ with $i(\$) = US$, $i(€) = EA$ and $i(¥) = CHN$, and $\mathcal{I}(t > 2021)$ is a dummy variable that indicates years since Russia's invasion of Ukraine in 2022. We include euro area countries in the regressions for euro invoicing and the role of geopolitical distance to the euro area, but in Table 4 below we report results without them.

Table 3 presents the results. The coefficient estimates reported for "geopolitical distance to invoicing currency issuer" in columns (1) to (4) suggest that, on average *over the entire sample period*, the use of the dollar and the euro for trade invoicing has not been systematically related to geopolitical distance. This is consistent with Figures 6 and 7, which suggest that dollar invoicing is in fact more prevalent in US least-aligned countries, and that the decline in dollar invoicing in least-aligned countries since the 2010s has not been broad based. At the same time, over the entire sample period, the

The results are consistent with those reported in Table 2. It is important to note that the specification in Equation (2) imposes homogeneous coefficients across invoicing currencies—a restriction that appears invalid, particularly in light of the heterogeneous effects of bilateral and currency-bloc trade shares observed in Table 2. As we show below, this assumption affects the estimated coefficients of other variables of interest, including geopolitical distance. For this reason, we focus on the currency-specific panel regressions in Equation (1), and report results from pooled exporter–invoicing currency panel regressions in Equation (2) only in the appendix.

results in especially column (5) suggest that the renminbi's use has tended to be greater for exporters that are geopolitically closer to China. This is consistent with Figure 8, which suggests that renminbi invoicing has been increasing from an earlier point in time in China most-aligned and US least-aligned countries.

The results presented in Table 3 also show how the relationship between invoicing currency choice and geopolitical distance has *changed* since Russia's invasion of Ukraine in 2022. The coefficient estimates for the interaction terms between geopolitical distance and the post-2021 dummy in columns (1) to (4) in Table 3 indicate that the correlation between dollar and euro invoicing and geopolitical distance to their corresponding issuers has become more negative. Focusing on columns (2) and (4), which control for the oil trade share, the *overall* correlation between invoicing currency use and geopolitics have become negative for both the dollar and euro (-0.51-0.36=-0.87 for the dollar and -0.28-0.77=-1.05 for the euro), though the overall effect is statistically significant at conventional levels only for the euro (see the p-value in the final row of the regression statistics). The results for the renminbi also suggest that the correlation between dollar and euro invoicing and geopolitical distance to their corresponding issuers has become more negative: while the correlation for the use of the renminbi and geopolitical distance from China was negative already over the full sample period when controlling for the commodity export share in column (5), it has turned even more negative since 2022, although this is not very precisely estimated. When controlling for the oil export share in column (6), the correlation has turned negative statistically significantly since 2022 (see the last row in the regression statistics).

Table 3: Panel regressions for export invoicing shares and geopolitical distance

	USD		EUR		CNY	
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged invoicing currency share	0.73***	0.75***	0.80***	0.80***	0.92***	1.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Commodity trade share	0.09***		-0.04**		0.00	
	(0.00)		(0.04)		(0.42)	
Oil trade share		0.17***		-0.17***		-0.01*
		(0.01)		(0.00)		(0.06)
Geopolitical distance to invoicing currency issuer	1.06	-0.51	0.09	-0.28	-0.08**	-0.05
	(0.15)	(0.54)	(0.85)	(0.62)	(0.02)	(0.23)
Geopolitical distance to invoicing currency issuer × post-2021	-0.12	-0.36*	-0.44*	-0.77***	-0.05	-0.03
	(0.68)	(0.09)	(0.06)	(0.00)	(0.14)	(0.11)
Standard controls	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
Within R-squared	0.65	0.65	0.77	0.78	0.83	0.96
Observations	1278	1307	1284	1303	696	704
Countries	113	111	111	110	89	88
p-value full effect	0.13	0.34	0.52	0.08	0.01	0.04

Note: The last line of the table "p-value full effect" reports the p-values for the overall effects.

A set of robustness checks confirm the results from Table 3. Table B.3 suggests that when we use *import* invoicing currency shares as dependent variable and *trading-partner* average geopolitical distance to the invoicing currency issuer, the coefficient for geopolitical distance since Russia's invasion of Ukraine is highly statistically significant for the dollar and the renminbi; for the euro, the coefficient is negative even for the overall sample period. Figure A.15 explores systematically the time variation in the conditional correlation between export invoicing currency shares and geopolitical distance, confirming that is has become (more) negative only recently. Table B.4 documents that results for euro and renminbi export invoicing in Table 3 are not driven by Russia, Belarus or Uzbekistan, which stand out in Figure 10, while for dollar export invoicing shares the coefficient estimates of geopolitical distance to the US turn insignificant; note that data availability already limits the inclusion of some of these countries in the regressions in Table 3. Table B.5 documents that results for euro invoicing shares do not change when we use alternative definitions of geopolitical distance to the euro area.[23]

Having established that the correlation between an exporter's use of dollars (euros) for invoicing and its geopolitical distance from the US (euro area) has become more negative since 2022, we next examine how correlations have evolved with respect to geopolitical distance from countries that are *not* the corresponding invoicing currency issuer. For instance, we ask: has invoicing in dollars become more positively correlated with geopolitical distance from China? To answer these questions systematically, we estimate:

$$s^c_{e,t} = \rho^{c,i} s^c_{e,t-1} + \boldsymbol{\beta}^{c,i\prime} \boldsymbol{w}^c_{e,t} + \delta^{c,i} geopdist^i_{e,t} + \gamma^{c,i}[geopdist^i_{e,t} \times \mathcal{I}(t > 2021)] + \alpha^{c,i}_e + \tau^c_t + u^{c,i}_{e,t}, \quad (4)$$

separately for all combinations of invoicing currencies $c \in \{\$, €, ¥\}$ and invoicing currency issuers $i \in \{US, EA, CHN\}$. By running separate regressions for each combination, we avoid including geopolitical distance from exporter e to all invoicing currency issuers in the same regression. This is important because bilateral geopolitical distances are almost perfectly correlated, so including them simultaneously results in multicollinearity.[24]

Table 4 presents the results from estimating the specification in Equation (4); we provide a con-

[23] Table B.6 reports results for the coefficient estimate of geopolitical distance to the invoicing currency issuer from pooled exporter-currency panel regressions analogous to Equation (2). Results are overall similar to those in Table 3, with the exception of a counterintuitive positive coefficient estimate for geopolitical distance to China. However, recall that pooled exporter-currency panel regressions impose arguably invalid homogeneity assumptions on the coefficients; in the regressions underlying the results shown in Table B.6 it is assumed that, e.g., bilateral export shares have the same effect on the dollar, the euro and renminbi invoicing, respectively. Indeed, Table B.7 documents that if we allow the coefficients on the compositional/mechanical correlates to differ across invoicing currencies by interacting them with corresponding dummy variables (coefficient estimates not reported to save space), the coefficient estimates for geopolitical distance after 2021 are consistent with those in Table 3.

[24] For example, Figure A.16 shows that economies' geopolitical distance from the US and from China are almost perfectly negatively correlated. This is unsurprising: if a country is aligned with the US, and the US and China represent opposing geopolitical poles, then alignment with one necessarily implies misalignment with the other. As a result, geopolitical proximity to the US and to China is nearly perfectly negatively correlated across countries.

densed presentation of these results below. Table 4 nests the results from Table 3, which correspond to the cases where geopolitical distance is measured from the country that issues the invoicing currency. Table 4 is organized to show specifications that control for commodity shares and oil shares, in the left and right part of each panel, respectively. The top, middle and bottom panels report changes in the correlation with geopolitical distance to the US, to the euro area and China, respectively. In addition to the dollar, the euro and the renminbi, we also report results for the exporter's home currency in columns (5)-(6) and (12)-(13). Specifically, columns (5) and (12) define home currency as the exporters' own currency, except for the euro for euro area economies—aligning with the treatment of the euro area economies in the regressions reported in columns (2) and (9)—and economies with an exchange rate peg to the euro. In contrast, columns (6) and (13) define home currency to include the euro for euro area economies and economies with an exchange rate peg to the euro, and correspondingly, columns (3) and (10) exclude euro area economies and economies with an exchange rate peg to the euro, thereby focusing on the role of the euro as a vehicle currency. Finally, columns (7) and (14) report results for third-country currencies other than the dollar, the euro, renminbi and home currency. Note that we can calculate invoicing shares for the other currency category only for exporter-year observations for which we have information on dollar, euro, renminbi and home currency invoicing shares.

The results in Table 4 suggest that while the use of the dollar for invoicing has become more negatively correlated with geopolitical distance from the US since 2021, it has become more *positively* correlated with distance from China. In particular, focusing again on the specifications that control for oil export share, in column (8), the estimated coefficient is larger in absolute value for geopolitical distance from China (0.86, bottom panel) than for distance from the US (-0.36, top panel). The results also indicate that the coefficient estimates for distance to the euro area (middle panel) have the same sign as those for distance to the US (top panel) across all columns except for column (1). In contrast, the coefficients for distance to China have the opposite sign. This pattern is intuitive, as the geopolitical distance data suggest that countries that have moved closer to the US have also tended to draw nearer to the euro area while distancing themselves from China. Our findings suggest that a similar polarization has manifested itself in the use of currencies in trade invoicing after 2021.

Given the large number of coefficient estimates in Table 4 (42 in total), we provide a visual summary of the results in Figure 12 using color-coded matrices. The rows of the matrices show invoicing currency issuer, while the columns invoicing currencies. A red cell suggests that the use of the corresponding invoicing currency has become more negatively correlated with geopolitical distance from the corresponding currency issuer. We only color cells when the corresponding estimates in Table 4 are statistically significant at the 10% level. The left and right hand side matrices are based on

Table 4: Panel regressions for export invoicing shares and geopolitical distance across invoicing currency issuers

Geopolitical distance to the US

	Commodity share							Oil share						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	USD	EUR	EUR (VCP)	CNY	Home	Home (incl. EUR)	Other	USD	EUR	EUR (VCP)	CNY	Home	Home (incl. EUR)	Other
Geopolitical distance to US× post-2021	-0.12	-0.27	-0.30**	0.08**	0.24**	-0.24	0.70***	-0.36*	-0.47***	-0.47***	0.05***	0.24***	-0.19	0.60***
	(0.68)	(0.11)	(0.04)	(0.03)	(0.02)	(0.30)	(0.00)	(0.09)	(0.01)	(0.00)	(0.01)	(0.01)	(0.32)	(0.00)
Remaining standard controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Within R-squared	0.65	0.77	0.72	0.83	0.68	0.77	0.47	0.65	0.78	0.73	0.96	0.65	0.77	0.61
Observations	1278	1284	931	696	604	1138	361	1307	1303	949	704	604	1136	360
Countries	113	111	92	89	57	102	46	111	110	91	88	54	97	44

Geopolitical distance to the euro area

	Commodity share							Oil share						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	USD	EUR	EUR (VCP)	CNY	Home	Home (incl. EUR)	Other	USD	EUR	EUR (VCP)	CNY	Home	Home (incl. EUR)	Other
Geopolitical distance to EA × post-2021	0.15	-0.44*	-0.47**	0.10**	0.31***	-0.25	0.75***	-0.16	-0.77***	-0.79***	0.08***	0.30**	-0.25	0.77***
	(0.68)	(0.06)	(0.01)	(0.03)	(0.01)	(0.38)	(0.00)	(0.52)	(0.00)	(0.00)	(0.01)	(0.02)	(0.31)	(0.00)
Remaining standard controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Within R-squared	0.65	0.77	0.72	0.83	0.68	0.77	0.46	0.65	0.78	0.73	0.96	0.65	0.77	0.60
Observations	1278	1284	931	696	604	1138	361	1307	1303	949	704	604	1136	360
Countries	113	111	92	89	57	102	46	111	110	91	88	54	97	44

Geopolitical distance to China

	Commodity share							Oil share						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	USD	EUR	EUR (VCP)	CNY	Home	Home (incl. EUR)	Other	USD	EUR	EUR (VCP)	CNY	Home	Home (incl. EUR)	Other
Geopolitical distance to CHN × post-2021	0.40	0.11	0.20	-0.05	-0.36**	0.16	-0.55**	0.86***	0.26	0.32**	-0.03	-0.36**	0.07	-0.76***
	(0.25)	(0.55)	(0.22)	(0.14)	(0.02)	(0.53)	(0.02)	(0.00)	(0.14)	(0.05)	(0.11)	(0.02)	(0.78)	(0.00)
Remaining standard controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Within R-squared	0.65	0.77	0.72	0.83	0.68	0.77	0.47	0.65	0.78	0.73	0.96	0.65	0.77	0.61
Observations	1278	1284	931	696	604	1138	361	1307	1303	949	704	604	1136	360
Countries	113	111	92	89	57	102	46	111	110	91	88	54	97	44

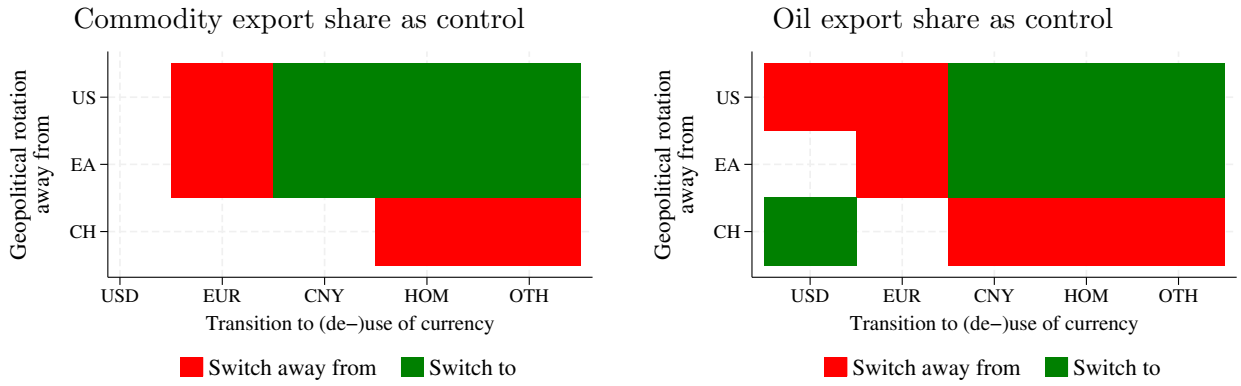
Note: The tables report results from regressions of Equation (4) for all combinations of invoicing currencies $c \in \{\$, €, ¥\}$ and invoicing currency issuers $i \in \{US, EA, CHN\}$. The table in the top row reports results for geopolitical distance from the US, the middle panel for geopolitical distance from the euro area, and the bottom panel for geopolitical distance from China. In each table the columns report results for different invoicing currency shares as dependent variable. In columns (5) and (12) home currency is defined as the exporters' own currency, except for the euro for euro area economies and economies with an exchange rate peg to the euro. In columns (6) and (13) home currency includes the euro for euro area economies and economies with an exchange rate peg to the euro. In columns (3) and (10) euro area economies and economies with an exchange rate peg to the euro are excluded. Columns (7) and (14) report results for third-country currencies other than the dollar, the euro, renminbi and home currency. We can calculate invoicing shares for the other currency category only for exporter-year observations for which we have information on dollar, euro, renminbi and home currency invoicing shares.

regressions that control for the commodity and oil export share, respectively.

The top left corner in the matrix to the right indicates that greater geopolitical distance from the US is associated with a lower use of the dollar as an export invoicing currency post-2021 compared to pre-2022. In the same vein, the green cells in the top rows indicate that geopolitical distancing away from the US is associated with a greater use of the renminbi, home and other third currencies (presumably that of the importer).[25] When controlling for the commodity export share, the results displayed in the matrix on the left are similar except that they suggest that dollar export invoicing tends to be uncorrelated with geopolitical distance to the US.

The results in the middle rows in the matrices in Figure 12 suggest that whether or not we control for commodity or oil export shares, geopolitical distancing from the euro area reduces the use of the euro in export invoicing. As for the dollar, geopolitical distancing from the euro area is associated with an increase in the use of the renminbi, home and other third currencies (presumably that of the importer).

Figure 12: Geopolitics and export invoicing currency



Note: The figure presents qualitatively the coefficient estimates $\widehat{\gamma}^{c,i}$ in Equation (4). Rows indicate the invoicing currency issuer and columns the invoicing currency. A red cell indicates the use of the corresponding invoicing currency is (conditionally) negatively correlated with a geopolitical distancing away from the corresponding invoicing currency issuer. We only display estimates that are statistically significant at the 10% level. The left (right) panel presents results using the commodity (oil) export share in $\boldsymbol{w}^c_{e,t}$.

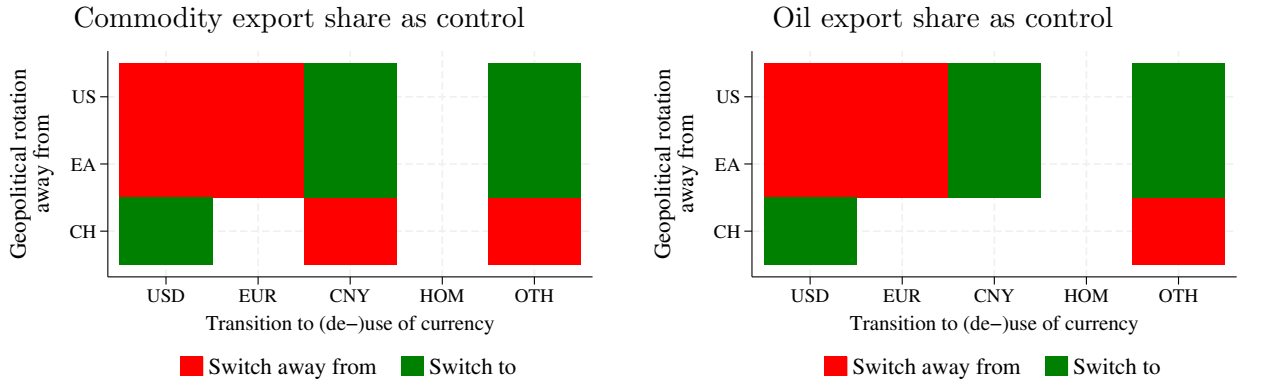
Conversely, when controlling for oil export shares our results suggest that countries that move geopolitically away from China (bottom row) show a greater tendency to invoice in dollars, while use of their own or other third-party currencies declines; when controlling for commodity export shares dollar and renminbi use seem not to change with geopolitical distancing from China, at least based on conventional significance levels (see Table 4 for the p-values). Overall, our results in Table 4 and summarized in Figure 12 point to an intuitive shift in invoicing currency patterns along geopolitical

[25] Figure A.17 presents analogous results from pooled exporter-currency panel regressions. Because for home and other currencies we do not have observations on all compositional/mechanical correlates such as bilateral export shares, we only control for commodity/oil export shares and the lagged dependent variable. Results are consistent with those displayed in Figure 12.

lines since Russia's invasion of Ukraine in 2022.

Figure 13 presents results for *import* invoicing currency shares analogous to those in Figure 12 for export invoicing; in the underlying regressions we use the importer's average trading partners' geopolitical distance to the US, the euro area and China. Overall, the results are broadly consistent across export and import invoicing, with two notable exceptions. First, unlike in the case of export invoicing, we observe less of a shift toward home currencies for import invoicing. This is intuitive as switching from dominant-currency to local-currency pricing, which would need to occur in this case, is less likely. Most importers in our sample are small open economies, for which strategic complementarities with domestic producers are typically weaker than with foreign competitors serving the same market. In contrast, for exports, switching to home currency corresponds to a shift from dominant-currency to producer-currency pricing, which is more plausible given that domestic inputs generally account for a large share of total inputs (Mukhin 2022). Second, the rotation towards and away from dollar invoicing associated with geopolitical distancing from China and the US, respectively, is estimated much more precisely in case of import invoicing currency patterns.

Figure 13: Geopolitics and trade invoicing currency (imports)



Note: See the notes to Figure 12. Geopolitical distance refers to that of trading-partners.

5 Geopolitics and invoicing currency patterns in commodity trade

5.1 Invoicing currency choice for commodity trade

Commodity products—particularly oil—have been predominantly invoiced in dollars in recent decades (Eichengreen et al. 2016, McLeay & Tenreyro forthcoming).[26] This pattern reflects the relatively homogeneous nature of commodity products and the limited pricing power of producers, which makes it

[26]For instance, the prices of West Texas Intermediate, Brent, and Dubai crude—three major global benchmarks for oil—are all quoted in dollars. The dollar serves as the unit of account for virtually all benchmark prices. NYMEX, the world's largest oil futures market, provides quotes exclusively in dollars.

convenient to quote prices in a single currency for ease of comparison.[27] Moreover, because commodities are typically traded on organized exchanges, prices adjust rapidly to global supply and demand conditions, with arbitrage quickly eliminating deviations from world prices. Importantly, the invoicing currency also serves as the settlement currency. This raises two key considerations regarding the relevance of invoicing currency choice in international commodity trade.

First, in standard models, the choice of invoicing currency is typically inconsequential when prices are flexible. However, even in these models, the invoicing currency of intermediate inputs—regardless of whether their prices are sticky—can influence an exporter's invoicing decision through the marginal costs channel (Gopinath et al. 2010, Mukhin 2022). Moreover, recent work shows how exchange rates can have allocative effects even when commodity dollar prices are flexible (McLeay & Tenreyro forthcoming). In particular, when prices of local input factors are sticky in domestic currency, firms in a small open economy exporting commodities experience a rise in profits expressed in dollar terms and raise production following exchange rate depreciation vis-à-vis the dollar. Thus, invoicing currency choice remains empirically relevant even when prices are flexible in the invoicing currency.

Second, while interactions between currency choices for different purposes—such as trade invoicing and household saving—have been explored (see Chahrour & Valchev 2022, Gopinath & Stein 2021), standard models generally abstract from the choice of settlement currency. Yet, in practice, settlement currency choice may also interact with invoicing currency choice, particularly in trade between economies aligned with different geopolitical blocs.[28]

5.2 Reduced use of the dollar in oil export invoicing of US least-aligned countries?

Anecdotal evidence suggests that several countries have recently sought to use alternative currencies to settle commodity trade. For instance, Russia has settled oil exports to China in renminbi (Reuters 2023*c*), while Iran and Venezuela are also believed to have shifted to renminbi for settling their oil exports to China (CNN 2012, Reuters 2019). Venezuela is reported to increasingly settle oil exports

[27] Historically, this role was played by the British pound sterling. Today, it is the dollar, as centralized commodity exchanges—such as those in London, New York, and Chicago—have emerged as key clearinghouses for balancing global supply and demand (McKinnon 1979).

[28] For example, if the use of a particular currency is prohibited or subject to financial sanctions that reduce its availability for settlement, it may no longer be optimal to use that currency for invoicing. This is because such restrictions can increase the difficulty of minimizing deviations between the optimal preset sticky price and the price that would be optimal when shocks are revealed and resetting was possible. To illustrate this, suppose an exporter finds it optimal to price in dollars due to input-output linkages and strategic complementarities with competitors. Suppose further that settlement in dollars is prohibited. The exporter could still price in dollars and simply quote the optimal preset dollar price in the home currency, based on the prevailing exchange rate. However, doing this exposes the exporter to additional exchange rate risk. For example, if the home currency depreciates against the dollar between the time of pricing and the time of payment, the preset price in home currency will have been too low. A predictable depreciation could be factored into the preset price, but exchange rate movements are typically viewed as unpredictable. As a result, quoting and settling in the home currency leads to more volatile deviations from the optimal preset price in dollars, thereby reducing the attractiveness of the dollar as an invoicing currency.

in cryptocurrencies (Reuters 2024). India has settled oil imports from the United Arab Emirates in Indian rupees (Reuters 2023*a*), and after settling some of its oil imports from Russia in renminbi (Reuters 2023*b*) there have been discussions about also settling in rubles (Bloomberg 2024). Similarly, there have been reports of negotiations to settle a portion of Saudi Arabia's oil exports to China—its largest customer—in renminbi (Wall Street Journal 2022).[29] Notably, many of these countries—such as Russia, Venezuela, Iran, and China—are not geopolitically aligned with the US.

Current developments in currency use in commodity transactions may be informative for future developments in more downstream transactions. However, a key challenge in analyzing these developments is the lack of currency use data specifically for commodity transactions. As a result, our exploration of whether recent shifts in currency use in commodity transactions are reflected in the behavior of US least-aligned exporters based on our dataset is only suggestive. Our approach is to explore whether there is any evidence that would be symptomatic of reduced reliance on the dollar in commodity trade.

As a first step, we examine the evolution of the relationship between world oil prices and countries' oil trade shares over time. Oil prices have historically co-moved strongly with oil trade shares—a pattern largely driven by mechanical factors: invoiced in dollars, when the oil price rises—and to the extent that demand and exchange rates do not adjust in the short run—the value of oil trade quoted in local currency increases, in turn increasing its share in total trade. A weakening of this co-movement may indicate a shift in currency use away from the dollar, with exchange rate fluctuations contributing to the observed decoupling.

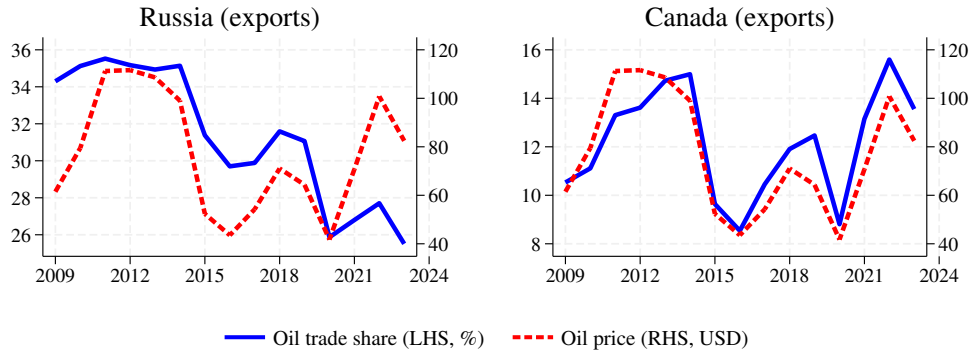
In this analysis, we focus specifically on oil rather than broader commodity categories, as oil is a more homogeneous good and does not require the use of country-specific price indices. Moreover, the anecdotal evidence discussed earlier pertains primarily to oil trade. Figure 14 illustrates trends in world oil prices and oil trade shares for two countries: oil export shares for Russia (left panel) and oil export shares for Canada as a benchmark oil producer that is geopolitically aligned with the US (right panel). Several observations from these trends are worth highlighting.

As expected, oil prices have historically co-moved strongly with oil trade shares over time. In line with the anecdotal evidence discussed earlier, this co-movement has weakened recently for Russia's oil exports. This is consistent with a shift away from dollar invoicing. An alternative explanation for the recent decoupling between global oil prices and oil trade shares in Russia could be the price cap imposed on Russian oil exports by the G7 and coalition countries in response to the invasion of Ukraine, which may have detached the pricing of Russia's oil exports from global benchmarks. In

[29]Indeed, China has settled liquefied natural gas (LNG) trade with the United Arab Emirates in renminbi (China Daily 2023), and has successfully executed oil settlements in digital yuan on the Shanghai Petroleum and Natural Gas Exchange (Centralbanking.com 2023).

contrast to Russia, for Canada—an oil exporter geopolitically aligned with the US in our sample—the oil export share continues to exhibit a strong co-movement with world oil prices, suggesting the weakening co-movement for Russia may indeed be due to idiosyncratic factors.

Figure 14: Correlation between oil prices and oil export shares for Russia and Canada



Note: The figure presents the evolution of oil prices (red dashed lines) and oil export shares for Russia and Canada (blue solid lines).

We next run regressions to examine directly the relationship between oil export and dollar invoicing shares. We estimate regressions of dollar export invoicing shares based on Equation (1), augmenting the specification with a triple interaction term: the oil export share $\omega_{e,t}^{oilx}$, a post-2021 indicator, and a dummy variable for US least-aligned countries. Specifically, we estimate:

$$s_{e,t}^{usd} = \rho s_{e,t-1}^{usd} + \boldsymbol{\beta}' \boldsymbol{w}_{e,t}^{usd} + \gamma[\omega_{e,t}^{oilx} \times \mathcal{I}(t > 2021) \times \mathcal{I}(e \notin \mathcal{A}^{US})] + \boldsymbol{\delta}' \boldsymbol{z}_{e,t} + \alpha_e + \tau_t + u_{e,t}, \quad (5)$$

where $\mathbf{z}_{e,t}$ includes all other interaction terms and $\mathcal{A}^{US}$ is the set of US most-aligned countries. The inclusion of bilateral exchange rates against the US dollar and time fixed effects in the regression helps control for some alternative explanations for a potential weakening in the correlation between dollar invoicing and oil export shares.[30] The coefficient of interest is γ, which captures whether the correlation between commodity exports and dollar invoicing shares has declined for US least-aligned economies after 2021.

The results in column (1) of Table 5 suggest that the correlation between oil export shares and dollar invoicing shares has not changed systematically post-2021 for US least-aligned economies. While the coefficient estimate is negative, which is consistent with a declining correlation between oil export shares and dollar invoicing shares, it is estimated quite imprecisely. As a result, it is impossible to ascertain whether the negative sign is due to a declining correlation or simply due to noise in the data. Columns (2) and (3) show that this finding remains when we additionally control for overall

[30] These include: oil prices decline relative to non-oil export prices for US least-aligned countries, possibly due to sanctions; oil demand falls relative to non-oil demand in US least-aligned countries; currencies of US least-aligned countries depreciate less against the dollar compared to those of US most-aligned countries.

exports—capturing shifts in relative demand between oil and non-oil exports—and the inclusion of separate year fixed effects for US least-aligned countries to account for differential trends relative to US most-aligned countries, and if we drop two key countries that stand out in Figure 10, namely Belarus and Russia.[31]

Table 5: Correlation between US dollar invoicing shares and oil export shares for US least-aligned countries post-2021

	(1)	(2)	(3)
Oil trade share	0.18***	0.25***	0.26***
	(0.00)	(0.00)	(0.00)
Oil trade share × least-aligned × post-2021	-0.04	-0.02	0.03
	(0.30)	(0.49)	(0.45)
Trade to GDP		-0.01	-0.01
		(0.71)	(0.46)
Standard controls	✓	✓	✓
Full set of interactions	✓	✓	✓
Year FEs	✓	✓	✓
Year × Least-aligned FEs	-	✓	✓
Within R-squared	0.65	0.66	0.65
Observations	1307	1283	1262
Countries	111	107	105

Note: Column (3) excludes Belarus and Russia relative to column (2).

6 Conclusion

This paper updates and extends the dataset on global trade invoicing currency patterns at the country level originally compiled by Boz et al. (2022). The key innovations in the new dataset include the extension of trade invoicing currency shares to cover the years 2020–2023 and the incorporation of data on the Chinese renminbi. In addition, we expand coverage to 132 countries and revise several earlier estimates. As a result, the new dataset constitutes the most comprehensive source on global trade invoicing currency patterns currently available in the literature.

Using the new dataset, we analyze recent trends in global trade invoicing currencies, with particular focus on the role of the Chinese renminbi and the influence of geopolitical alignment. At the global level, invoicing currency patterns have remained broadly stable in recent years. Nonetheless, our dataset reveals important shifts. Most importantly, although the renminbi's share in global trade invoicing remains modest, it has grown rapidly since the early 2010s. Initially concentrated in Asia, renminbi invoicing has since expanded in many regions.

[31] The results reported in Table B.8 based on the commodity instead of the oil export share are consistent with those in Table 5, even if the coefficients are estimated somewhat more precisely. However, there is no anecdotal evidence of comparable policy efforts targeting de-dollarization in non-oil commodities.

Geopolitical distance emerges as an increasingly important correlate of invoicing currency choices, particularly following Russia's invasion of Ukraine in 2022. Over the full sample period, the use of the dollar and the euro exhibits little systematic relationship with geopolitical alignment, while the renminbi has been generally used more by countries geopolitically closer to China. However, since 2022, the use of the dollar and the euro are more negatively correlated with geopolitical distance from the US and the euro area. This effect extends beyond compositional changes in trade patterns. Specifically, the renminbi—along with home and third-country currencies—increasingly supplants the dollar and the euro in countries that have distanced themselves geopolitically from the US and the euro area. Similarly, in countries that have moved closer to China, the dollar is being replaced by home and third-country currencies. While these findings confirm the resilience of a dominant currency, they also point to an emerging fragmentation in invoicing patterns along geopolitical lines.

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Patterns of invoicing currency in global trade in a fragmented world economy

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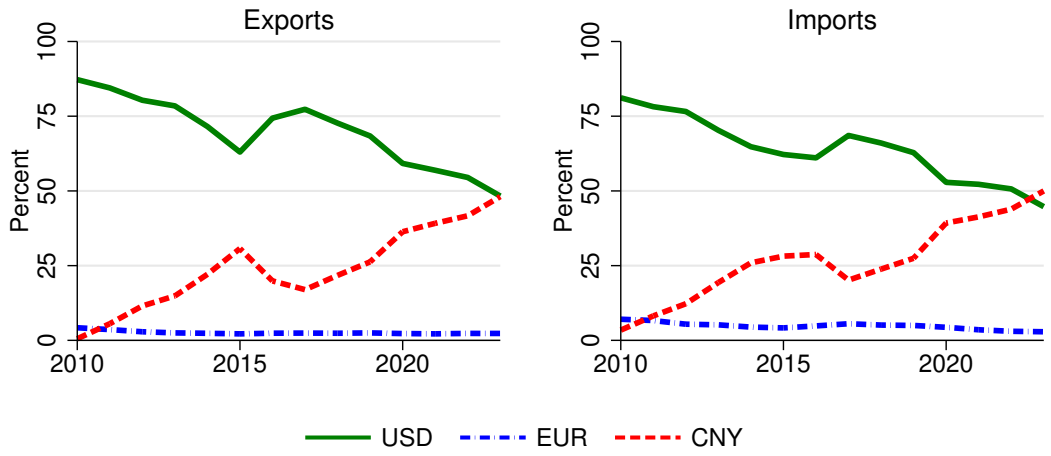
Georgios Georgiadis, Gita Gopinath, Arnaud Mehl

Online Appendix

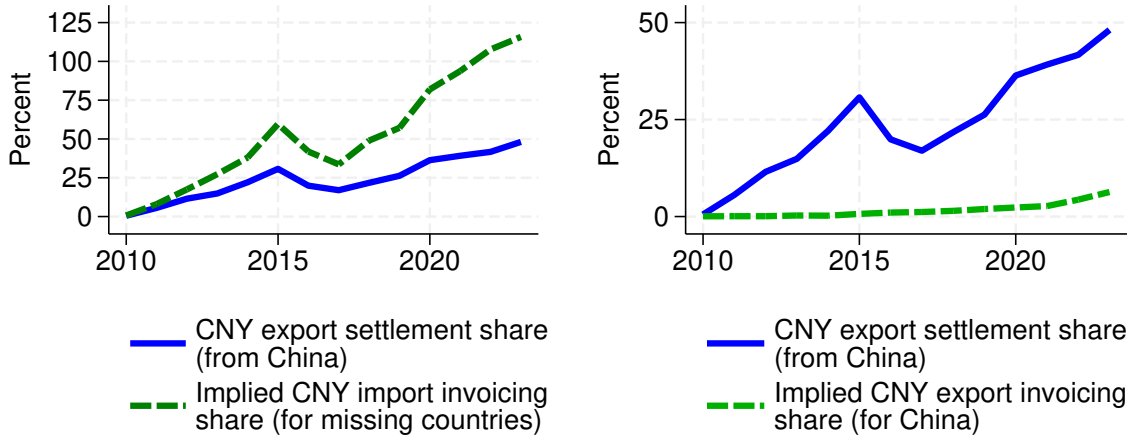
A Additional Figures

Figure A.1: Evolution of the share of China's trade settled in US dollar, euro and renminbi



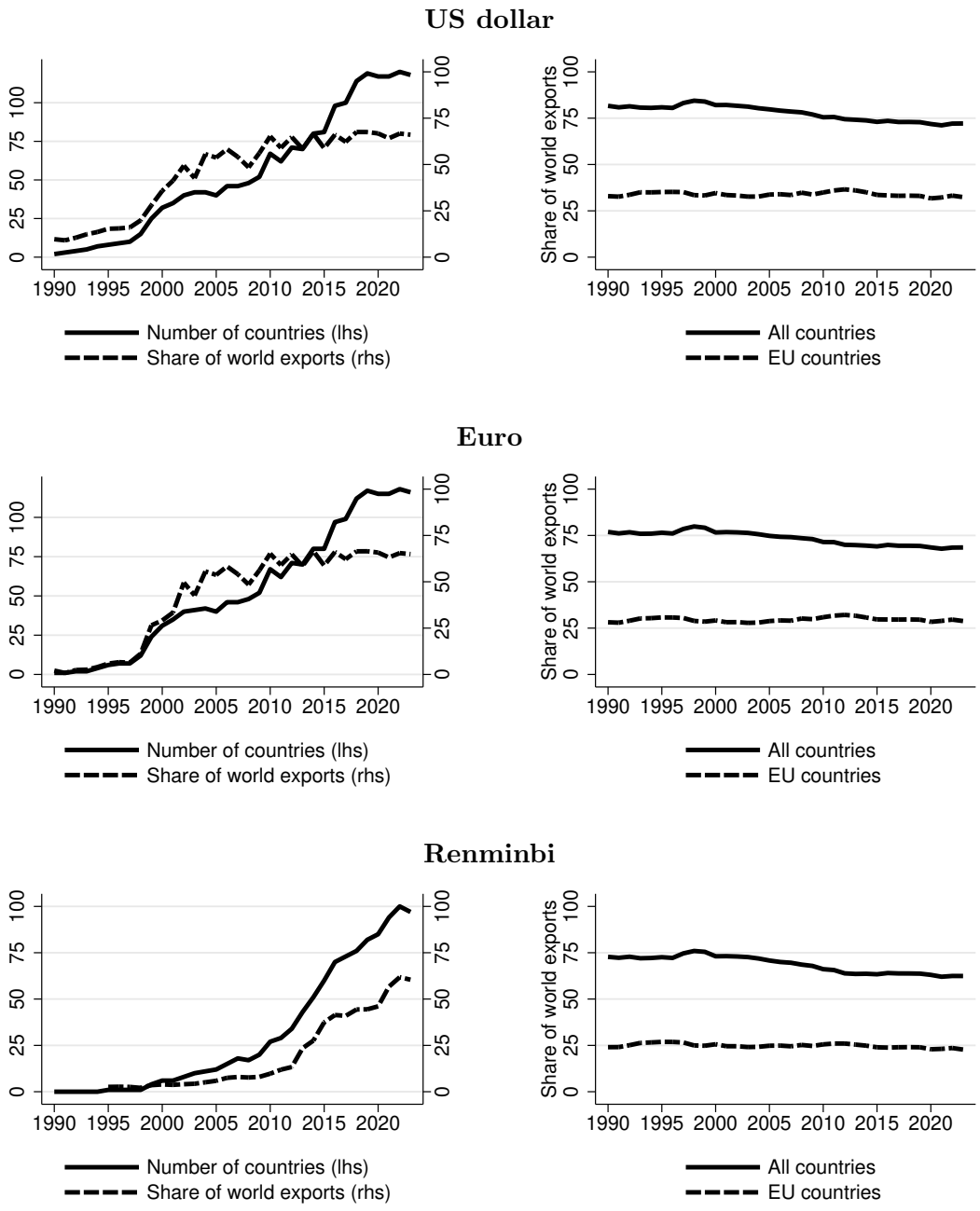
Note: The figure shows the evolution of the shares of China's trade settled in renminbi (red dashed), US dollar (green solid), and euro (blue dash-dotted). The left panel shows settlement currency shares for China's exports, and the left side for imports. Data are obtained from SAFE.

Figure A.2: Implied renminbi import invoicing share for countries not in our dataset



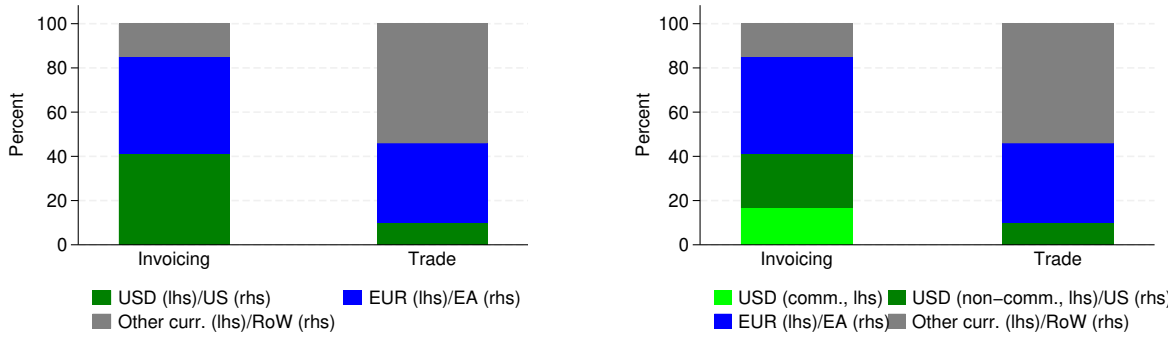
Note: In the left panel the solid blue line depicts the share of China's exports settled in renminbi according to SAFE. The green dashed line depicts the implied share of imports invoiced in renminbi of countries not in our dataset under the assumptions that (i) China's exports settled in renminbi are also invoiced in renminbi and (ii) renminbi invoicing occurs only in bilateral trade with China. The right panel shows analogous renminbi settlement data for China and implied renminbi export invoicing shares for the countries not in our dataset. See Appendix C for details on the calculations.

Figure A.3: Country and world export share coverage for invoicing currency data



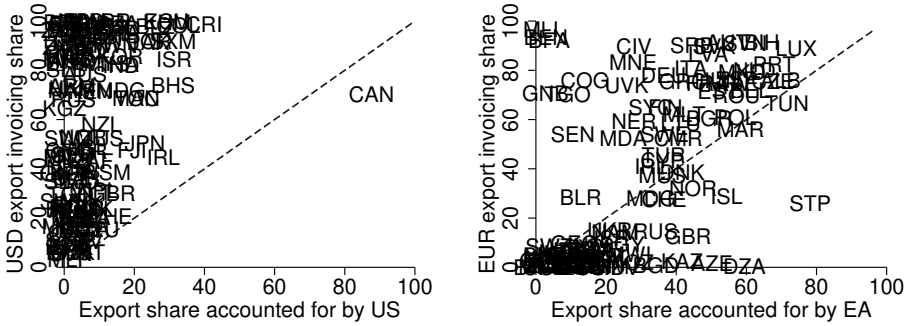
Note: The figure plots the coverage of the data on the invoicing currency shares of exports over time. The left panel shows the evolution of our country count and of the share of world exports covered in the raw data; the right panel shows the share of world exports that our data cover after interpolation and extrapolation.

Figure A.4: Shares of global trade and invoicing currency



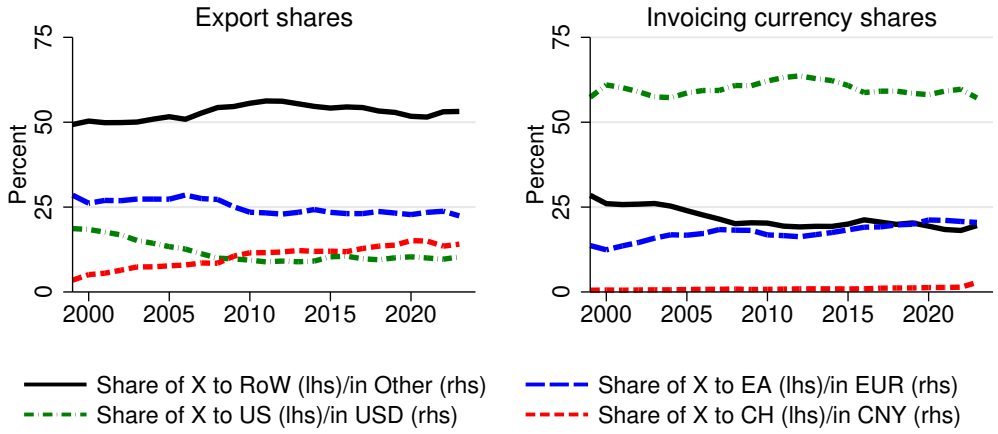
Note: The left-hand side panel plots the share of exports to the US, the EA, and the rest of the world as well as the share of exports that are invoiced in US dollars, euros, and other currencies. Only countries for which we have invoicing data are considered; hence the trade shares shown exclude the exports of several large countries, including China and Mexico. The figure corresponds to Figure 2 in Gopinath (2015). Interpolated and extrapolated data are averaged over time from 1999 to 2023. The right panel presents the same information except that exports invoiced in dollars are split into commodity and non-commodity exports. To do so, we assume that all *commodity exports are invoiced in dollars and we use data on the share of exports due to commodities; here commodity trade is measured as the sum of the shares – obtained from the World Bank's "World Development" Indicators – due to agricultural raw materials, ores and metals, and fuels.*

Figure A.5: Trade and invoicing currency shares at the country level



Note: The figure presents scatter plots of the share of countries' total exports accounted for by the US and the share of total exports invoiced in US dollar (left panel) as well as the share of total exports accounted for by the euro area and the share of total exports invoiced in euro (right panel). The figure shows averages over 1990-2023. The averages are only calculated over years for which we have both export invoicing and export share data.

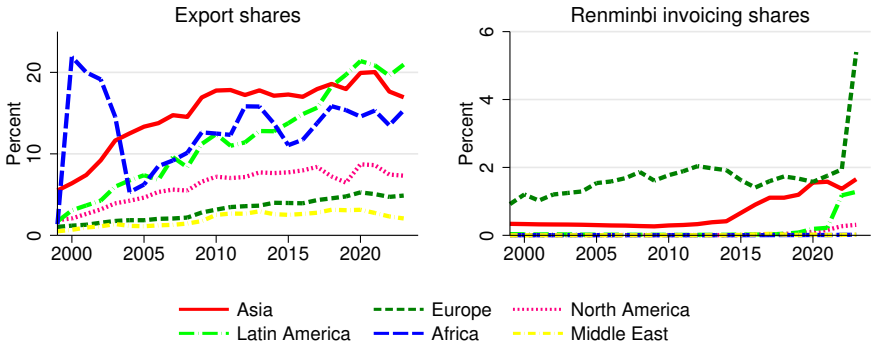
Figure A.6: Global trade and invoicing currency shares over time without euro area countries



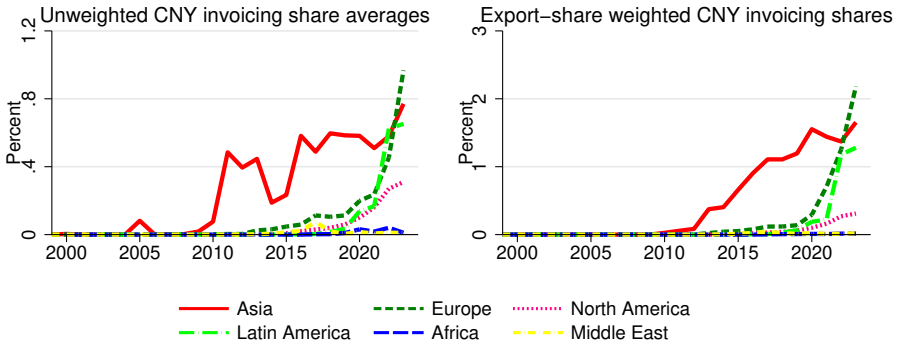
Note: The left panel depicts the evolution of the share of exports to the US, the euro area, China, and the rest of the world in total global exports; the right panel plots the share of global exports that are invoiced in US dollars, euros, renminbi, and other currencies. Only exports to countries for which we have invoicing data are considered. In contrast to the bottom row in Figure 4, euro area countries are excluded. The graphs are based on interpolated and extrapolated data.

Figure A.7: Share of exports invoiced in renminbi for alternative specifications

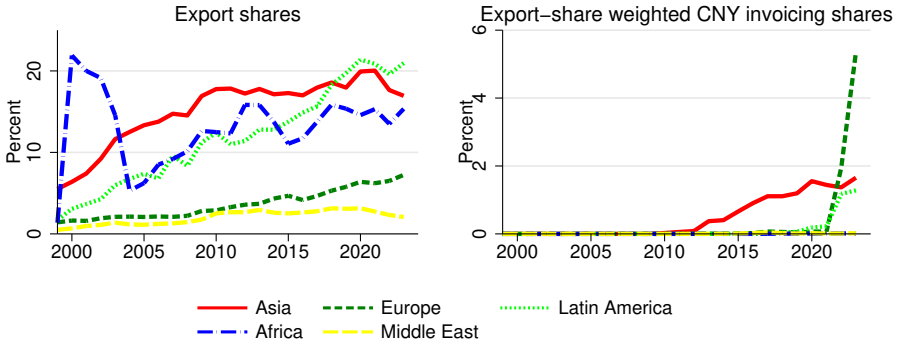
Inter/extrapolated renminbi invocing shares



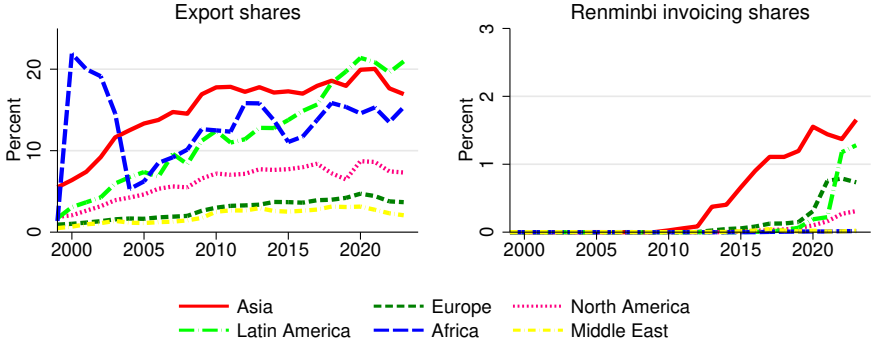
Unweighted and export-share weighted country averages



Without euro area countries

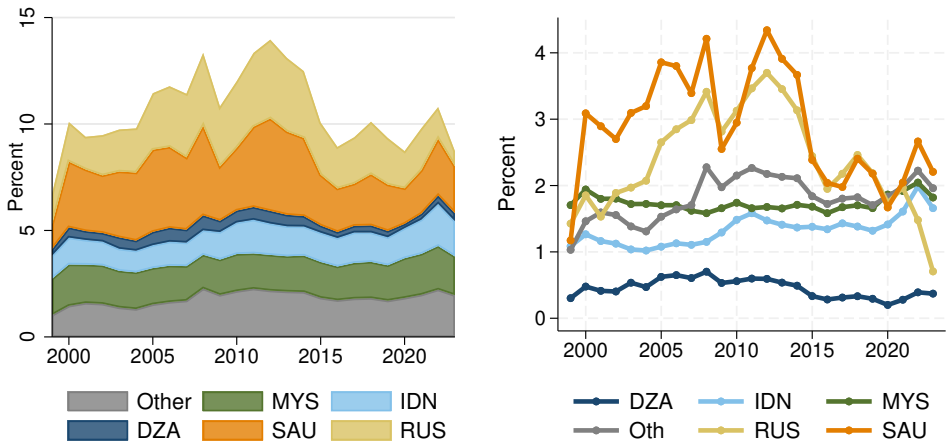


Without Russia in the European bloc



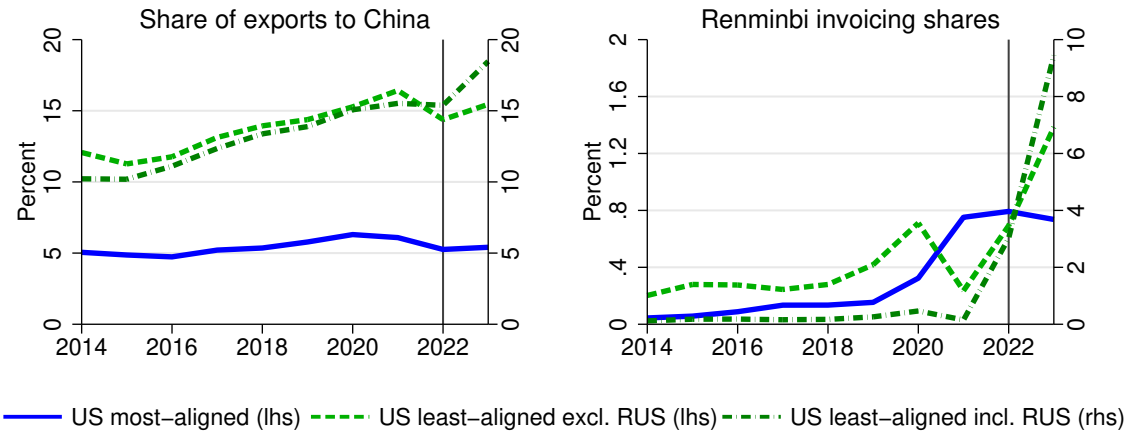
Note: The figure shows alternative versions of Figure 5. In the top row we use intra/extrapolated renminbi invoicing shares. In the second row, the left panel shows unweighted renminbi export invoicing shares, while the right panel shows the export-weighted invoicing shares as in the right panel of Figure 5. In the third row we exclude euro area countries, and in the fourth row we exclude Russia from the European country group.

Figure A.8: Decomposition of the evolution of the share of global exports by US non-aligned countries invoiced in US dollars, as a share of world exports



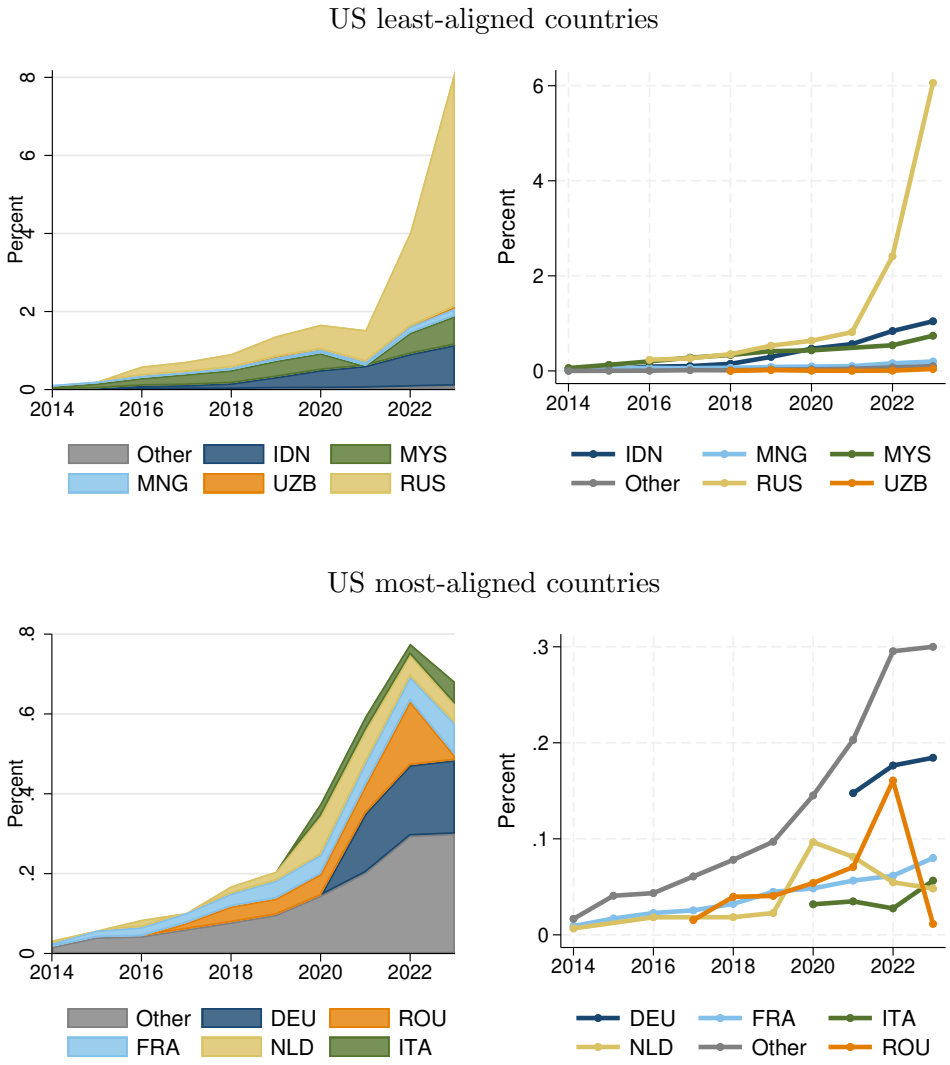
Note: The figure presents a decomposition of the evolution in the share of global exports invoiced in US dollars by US non-aligned countries over time shown in the top right-hand side panel in Figure 6 by country. The right-hand side panel shows the share of global exports invoiced in US dollar by these countries, and the left-hand side panel stacks them together.

Figure A.9: Exports from China and renminbi invoicing by geopolitical alignment with US



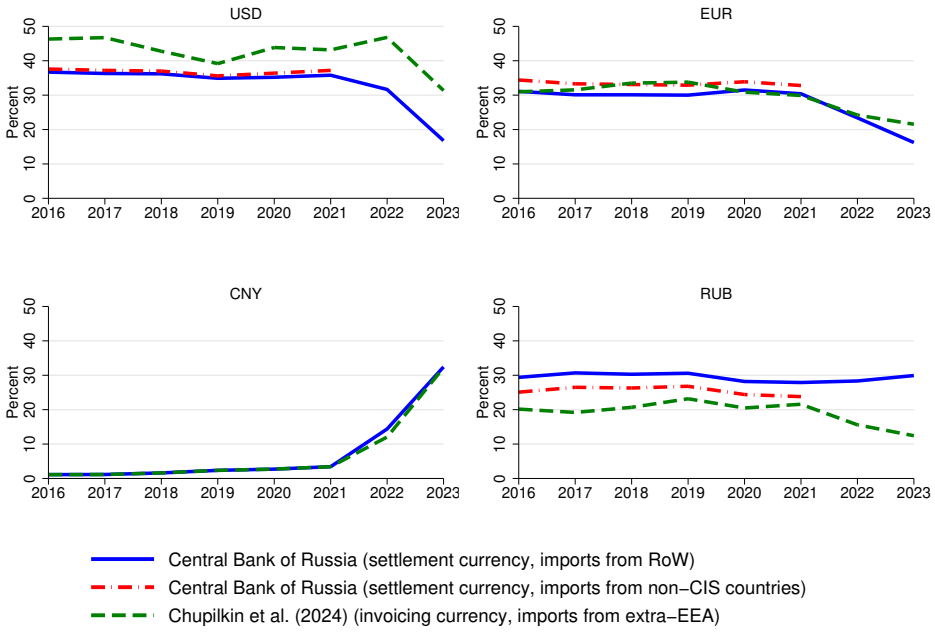
Note: The left panel depicts the share of total country-group exports that is destined to China; we only include countries for which we have renminbi invoicing currency information in our dataset. The right panel shows the share of total country-group exports that is invoiced in renminbi. The vertical lines indicate 2022.

Figure A.10: Decomposition of change in imports from China invoiced in renminbi



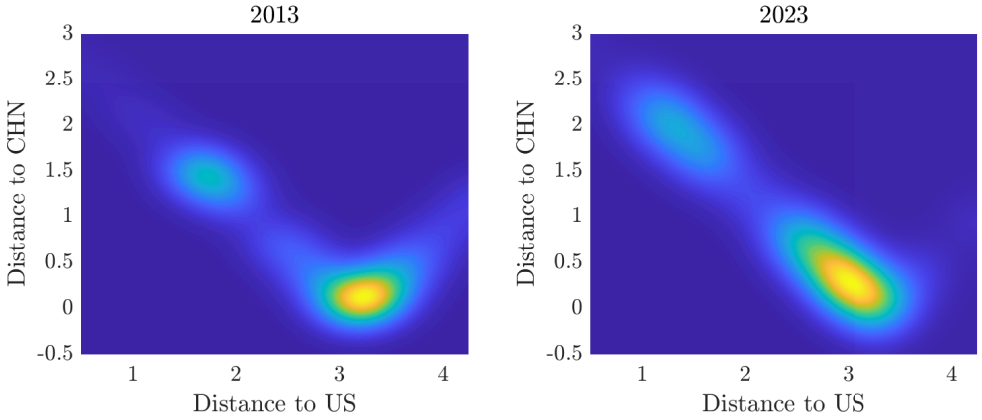
Note: The left panels break down the share of total imports from China invoiced in renminbi for the five largest countries within the group of US non-aligned countries (top row) and US aligned countries (bottom row), respectively. The right panels show the evolution of renminbi invoicing shares for these five countries, along with an aggregate of all remaining US aligned countries. We use the raw renminbi invoicing shares rather than inter/extrapolated data. For further details, see the note to Figure 8.

Figure A.11: Comparison of settlement and invoicing currency for Russia



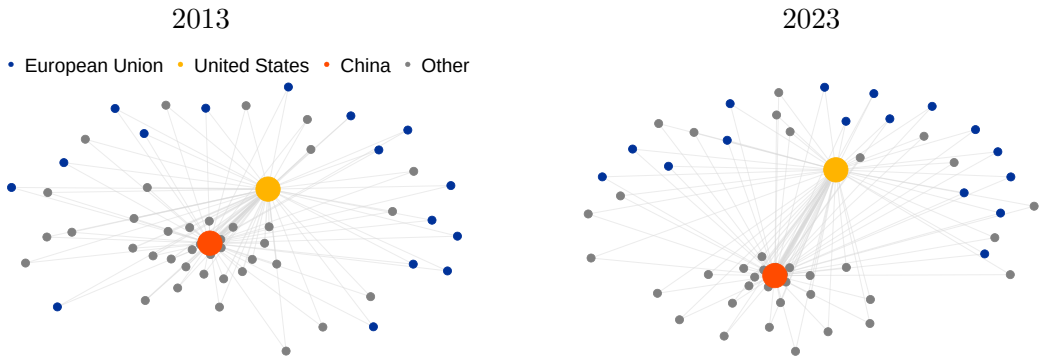
Note: The figure shows a comparison of invoicing and settlement currency data for Russia. We take settlement currency information from Central Bank of Russia. Trade invoicing currency information is based on customs data and obtained from Chupilkin et al. (2023). The blue solid lines depict settlement currency shares in Russia's imports from the rest of the world. The red dash-dotted lines depict settlement currency shares in Russia's imports from countries in the rest of the world excluding countries Commonwealth of Independent States (Ukraine, Moldova, Georgia, Armenia, Azerbaijan, Belarus, Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan and Tajikistan). The green dashed lines depict invoicing currency shares in Russia's imports from the rest of the world excluding countries in the Eurasian Economic Union (Armenia, Belarus, Kazakhstan, Kyrgyzstan).

Figure A.12: Cross-country distribution of geopolitical distance to China and the US



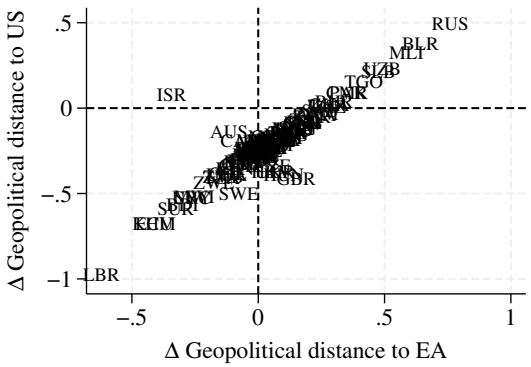
Note: The figure shows density plots for the bivariate cross-country distribution of geopolitical distance to the US (horizontal axis) and China (vertical axis) in 2013 and 2023. Geopolitical distance is take from Bailey et al. (2017). Brighter areas indicate a greater mass of countries.

Figure A.13: Network charts for geopolitical distance to the US and China over time



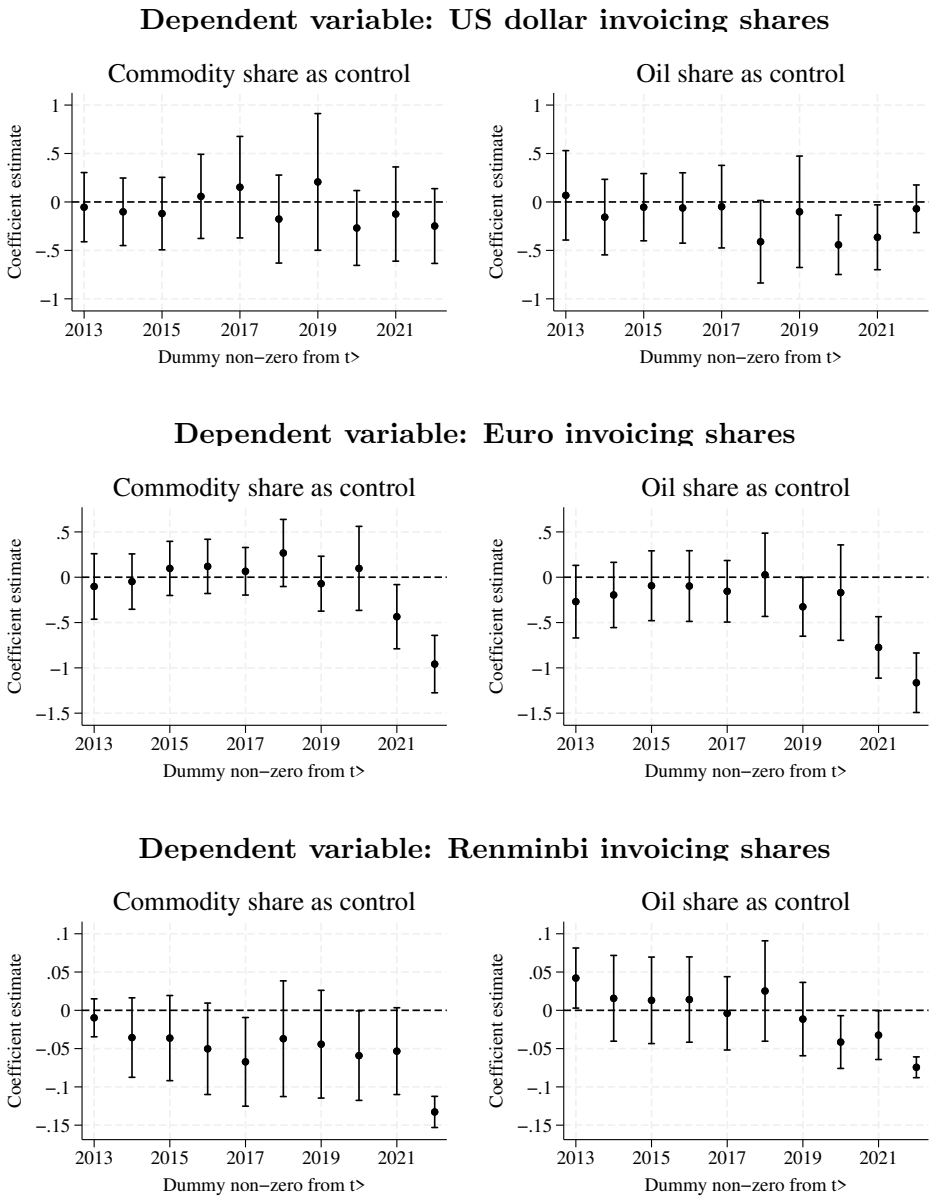
Note: The panels present country networks based on bilateral geopolitical distances to the US and China for 2013 and 2023. Geopolitical distance is given by the ideal distance point estimates from Bailey et al. (2017). Each node represents a country, and the length of each edge represents the estimate of a country's ideal point distance from the US and China, respectively.

Figure A.14: Changes in geopolitical distance to the US and the euro area between 2015-19 and 2022-23



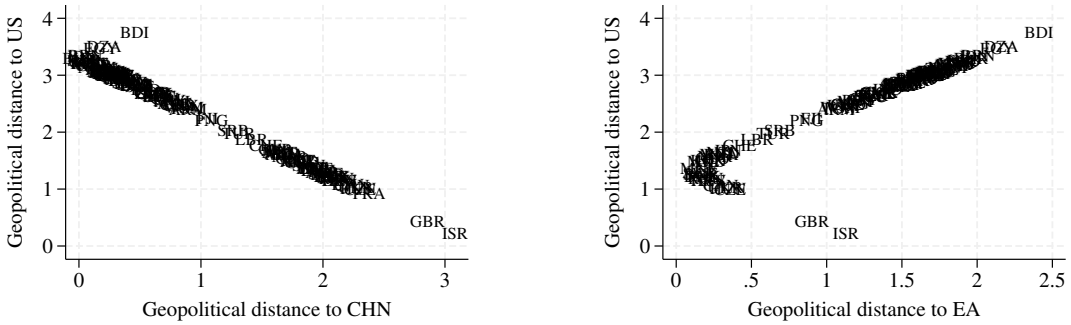
Note: The figure shows changes in bilateral geopolitical distances to the US and the euro area between 2015-19 and 2022-23 for the countries in our dataset. Geopolitical distance is measured based on the ideal point distance of Bailey et al. (2017) and voting patterns in the UN General Assembly. The horizontal axis depicts changes in geopolitical distance to the euro area and the vertical axis to the US. Geopolitical distance to the euro area is measured as the unweighted average of distances to individual euro area countries. We drop euro area countries.

Figure A.15: Panel regressions for export invoicing shares and geopolitical distance to the invoicing currency issuer post-2012



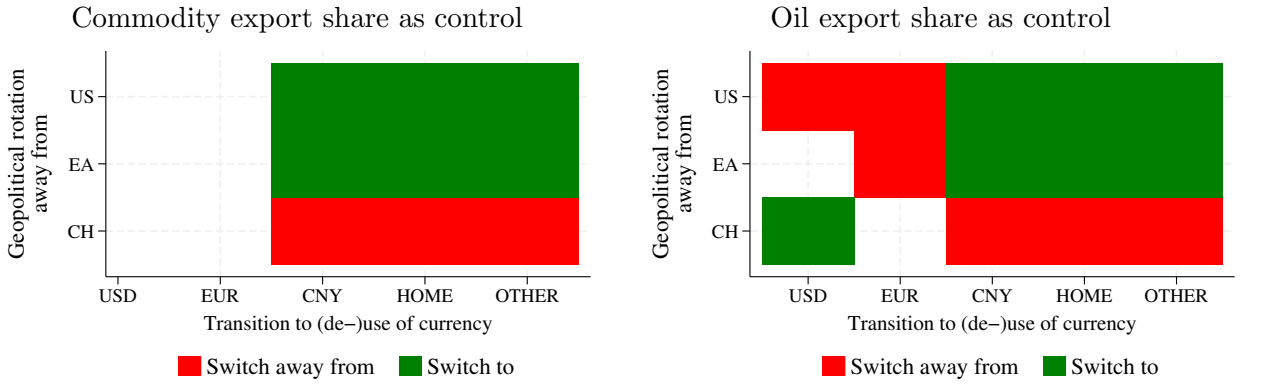
Note: The figure presents the coefficient estimate $\widehat{\gamma}^{c,i(c)}$ from Equation (3) for different choices of $\bar{t}$ in $\mathcal{I}(t > \bar{t})$. The dots represent the point estimate and the whiskers indicate the bounds of 90% confidence bands. The first row presents results for US dollar invoicing shares, the second for euro invoicing shares, and the third row for renminbi invoicing shares. Inference is based on Driscoll-Kraay standard errors..

Figure A.16: Bilateral geopolitical distance to the US, euro area and China in 2023



Note: The left (right) panel compares bilateral geopolitical distance to the US (euro area) and China in 2023.

Figure A.17: Geopolitics and export invoicing currency, results from pooled economy-currency panel regressions



Note: The figure presents qualitatively the coefficient estimates $\widehat{\gamma}^{c,i}$ from pooled economy-currency panel regressions analogues of Equation (4). Rows indicate the invoicing currency issuer and columns the invoicing currency. A red cell indicates the use of the corresponding invoicing currency is (conditionally) negatively correlated with a geopolitical distancing away from the corresponding invoicing currency issuer. We only display estimates that are statistically significant at the 10% level. The left (right) panel presents results using the commodity (oil) export share in $\boldsymbol{w}_{e,t}^{c}$.

B Additional Tables

Table B.1: Panel regressions for compositional/mechanical correlates of import invoicing shares

	USD		EUR		CNY	
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged invoicing currency share	0.82***	0.81***	0.84***	0.84***	0.94***	0.97***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Bilateral trade share with invoicing currency issuer	0.05	0.09**	0.11***	0.14***	0.01***	0.02***
	(0.31)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)
Trade share with rest of invoicing currency block	0.03	0.04	0.05*	0.13***	-0.02	-0.01
	(0.38)	(0.22)	(0.06)	(0.00)	(0.10)	(0.14)
Bilateral exchange rate against invoicing currency	-0.00	0.00	0.00	0.00	0.00***	0.00**
	(0.35)	(0.99)	(0.24)	(0.14)	(0.01)	(0.01)
Commodity trade share	0.05**		-0.00		-0.00	
	(0.03)		(0.96)		(0.26)	
Oil trade share		0.14***		-0.05		0.00
		(0.01)		(0.11)		(0.52)
Year FEs	✓	✓	✓	✓	✓	✓
Within R-squared	0.75	0.75	0.81	0.82	0.90	0.92
Observations	1343	1327	1368	1348	808	793
Countries	113	110	113	111	96	92

Note: See the note to Table 2.

Table B.2: Pooled economy-invoicing currency panel regressions for compositional/mechanical correlates of export invoicing shares

	Commodity share	Oil share
	(1)	(2)
Lagged invoicing currency share	0.76***	0.78***
	(0.00)	(0.00)
Bilateral trade share with invoicing currency issuer	0.08***	0.07***
	(0.00)	(0.00)
Trade share with rest of invoicing currency block	0.01	0.04**
	(0.54)	(0.02)
Bilateral exchange rate against invoicing currency	-0.00	-0.00
	(0.15)	(0.46)
Commodity trade share	-0.04**	
	(0.01)	
Commodity trade share $\times\mathcal{I}(c = USD)$	0.11***	
	(0.00)	
Oil trade share		-0.09***
		(0.00)
Oil trade share $\times\mathcal{I}(c = USD)$		0.25***
		(0.00)
Within R-squared	0.71	0.71
Observations	3316	3309
Country-currency pairs	316	308

Note: The table reports results from pooled economy-invoicing currency panel regressions in which the dependent variable is $s_{e,c,t}$, i.e., the share of exporter e's exports invoiced in currency c in period t.

Table B.3: Panel regressions for import invoicing shares and geopolitical distance

	USD		EUR		CNY	
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged invoicing currency share	0.82***	0.81***	0.84***	0.83***	0.94***	0.97***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Commodity trade share	0.05*		-0.00		-0.00	
	(0.05)		(0.98)		(0.45)	
Oil trade share		0.14***		-0.05		0.00
		(0.01)		(0.15)		(0.63)
Geopolitical distance to invoicing currency issuer	1.67	1.05	-1.75	-2.36***	0.17*	0.10
	(0.14)	(0.41)	(0.11)	(0.00)	(0.09)	(0.18)
Geopolitical distance to invoicing currency issuer × post-2021	-0.62**	-0.91***	-0.26	-0.16	-0.24***	-0.21***
	(0.05)	(0.01)	(0.42)	(0.53)	(0.01)	(0.00)
Standard controls	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
Within R-squared	0.75	0.75	0.81	0.82	0.91	0.92
Observations	1343	1327	1368	1348	806	793
Countries	113	110	113	111	95	92
p-value full effect	0.25	0.89	0.03	0.00	0.29	0.07

Note: See the notes to Table 3. Geopolitical distance refers to that of trading-partners.

Table B.4: Panel regressions for export invoicing shares and geopolitical distance: Excluding Russia, Belarus and Uzbekistan

	USD		EUR		CNY	
	(1)	(2)	(3)	(4)	(5)	(6)
Commodity trade share	0.09***		-0.03*		0.00	
	(0.00)		(0.06)		(0.42)	
Oil trade share		0.16***		-0.16***		-0.01*
		(0.01)		(0.00)		(0.06)
Geopolitical distance to invoicing currency issuer	1.11	0.62	0.10	-0.03	-0.08**	-0.05
	(0.15)	(0.28)	(0.83)	(0.94)	(0.02)	(0.23)
Geopolitical distance to invoicing currency issuer × post-2021	-0.14	-0.10	-0.40*	-0.63***	-0.05	-0.03
	(0.65)	(0.63)	(0.07)	(0.00)	(0.14)	(0.11)
Standard controls	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
Within R-squared	0.64	0.64	0.77	0.78	0.83	0.96
Observations	1261	1286	1266	1283	696	704
Countries	111	109	109	108	89	88
p-value full effect	0.13	0.36	0.55	0.14	0.01	0.04

Note: The table reports results from the regression of Equation (3) analogous to those reported in Table 3, but without Russia, Belarus and Uzbekistan. See also the note to Table 3.

Table B.5: Panel regressions for export invoicing shares and geopolitical distance: Alternative definitions of geopolitical distance to the euro area

	Baseline		Median		DE&FR		Trade-weighted	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Commodity trade share	-0.04**		-0.00		-0.00		-0.00	
	(0.04)		(0.41)		(0.42)		(0.41)	
Oil trade share		-0.17***		-0.17***		-0.16***		-0.17***
		(0.00)		(0.00)		(0.00)		(0.00)
Geopolitical distance to invoicing currency issuer	0.09	-0.28	-0.31	-0.18	-0.28*	-1.05**	-0.31*	-0.76
	(0.85)	(0.62)	(0.10)	(0.76)	(0.10)	(0.03)	(0.09)	(0.15)
Geopolitical distance to invoicing currency issuer × post-2021	-0.44*	-0.77***	-0.48*	-0.78***	-0.40*	-0.58***	-0.44*	-0.69***
	(0.06)	(0.00)	(0.06)	(0.00)	(0.06)	(0.00)	(0.06)	(0.00)
Standard controls	✓	✓	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓	✓	✓
Within R-squared	0.77	0.78		0.78		0.78		0.78
Observations	1284	1303	1284	1303	1284	1303	1284	1303
Countries	111	110	111	110	111	110	111	110
p-value full effect	0.52	0.08	0.00	0.13	0.00	0.00	0.00	0.01

Note: The table reports results from the regression of Equation (3) for euro export invoicing shares analogous to those reported in Table 3, but for different definitions of geopolitical distance to the euro area. Columns 1) and (2) report the baseline that uses an exporter's average geopolitical distance across euro area countries and which corresponds to columns (3) and (4) in Table 3. Columns (3) and (4) use an exporters median geopolitical distance across euro area countries, columns (5) and (6) the average geopolitical distance to France and Germany, and columns (7) and (8) the trade-weighted average geopolitical distance. See also the note to Table 3.

Table B.6: Pooled economy-currency panel regressions for export invoicing shares and geopolitical distance

	Commodity share		Oil share	
	(1)	(2)	(3)	(4)
Geopolitical distance to invoicing currency issuer	0.34		-0.08	
	(0.23)		(0.74)	
Geopolitical distance to invoicing currency issuer x post-2021	-0.08		-0.27***	
	(0.42)		(0.00)	
Geopolitical distance x $\mathcal{I}(c = \$)$		0.89		-0.39
		(0.21)		(0.62)
Geopolitical distance x $\mathcal{I}(c = \$)$ x post-2021		-0.01		-0.36**
		(0.98)		(0.05)
Geopolitical distance x $\mathcal{I}(c = €)$		-0.00		-0.06
		(0.99)		(0.92)
Geopolitical distance x $\mathcal{I}(c = €)$ x post-2021		-0.31		-0.49**
		(0.19)		(0.02)
Geopolitical distance x $\mathcal{I}(c = ¥)$		-0.01		-0.01
		(0.91)		(0.95)
Geopolitical distance x $\mathcal{I}(c = ¥)$ x post-2021		0.07		0.11**
		(0.20)		(0.01)
Within R-squared	0.71	0.71	0.71	0.71
Observations	3232	3232	3283	3283
Country-currency pairs	311	311	306	306

Note: The table reports results from pooled economy-invoicing currency panel regressions in which the dependent variable is $s_{e,c,t}$, i.e., the share of exporter e's exports invoiced in currency c in period t. To save space, all coefficient estimates except for those involving geopolitical distance to the invoicing currency issuer are not reported.

Table B.7: Pooled economy-currency panel regressions for export invoicing shares and geopolitical distance with heterogeneous effects for compositional/mechanical factors

	Commodity share		Oil share	
	(1)	(2)	(3)	(4)
Geopolitical distance to invoicing currency issuer	0.34		-0.10	
	(0.22)		(0.70)	
Geopolitical distance to invoicing currency issuer x post-2021	-0.12		-0.33***	
	(0.22)		(0.00)	
Geopolitical distance x $\mathcal{I}(c = \$)$		0.91		-0.44
		(0.18)		(0.59)
Geopolitical distance x $\mathcal{I}(c = \$)$ x post-2021		0.03		-0.36**
		(0.91)		(0.04)
Geopolitical distance x $\mathcal{I}(c = €)$		0.12		0.02
		(0.85)		(0.98)
Geopolitical distance x $\mathcal{I}(c = €)$ x post-2021		-0.34		-0.57***
		(0.12)		(0.01)
Geopolitical distance x $\mathcal{I}(c = ¥)$		-0.06		-0.03
		(0.10)		(0.29)
Geopolitical distance x $\mathcal{I}(c = ¥)$ x post-2021		-0.06*		-0.03*
		(0.08)		(0.09)
Within R-squared	0.71	0.71	0.71	0.71
Observations	3232	3232	3283	3283
Country-currency pairs	311	311	306	306

Note: The table reports results from pooled economy-invoicing currency panel regressions in which the dependent variable is $s_{e,c,t}$, i.e., the share of exporter e's exports invoiced in currency c in period t. To save space, all coefficient estimates except for those involving geopolitical distance to the invoicing currency issuer are not reported. In contrast to Table B.6, the regressions underlying the results reported in the table are run with heterogeneous coefficients for the trade shares with the invoicing currency issuer and its currency block, bilateral exchange rates and commodity/oil export shares for each invoicing currency.

Table B.8: Correlation between US dollar invoicing shares and commodity export shares for US non-aligned countries post-2021

	(1)	(2)	(3)
Commodity trade share	0.09***	0.10***	0.10***
	(0.00)	(0.00)	(0.00)
Commodity trade share × least-aligned × post-2021	-0.04	-0.04	-0.03
	(0.11)	(0.14)	(0.15)
Trade to GDP		-0.03	-0.03
		(0.14)	(0.14)
Standard controls	✓	✓	✓
Full set of interactions	✓	✓	✓
Year FEs	✓	✓	✓
Year × Least-aligned FEs	-	✓	✓
Within R-squared	0.65	0.66	0.65
Observations	1298	1274	1257
Countries	114	109	107

Note: Column (3) excludes Belarus and Russia relative to column (2).

C Assessing the usefulness of China's settlement currency as proxy for invoicing currency

Denote the share of CNY in China's export invoicing as

$$s_{CHN}^{x,CNY} = \frac{\sum_i X_{CHN,i}^{CNY}}{\sum_i X_{CHN,i}}, \tag{C.1}$$

and the share of CNY in the invoicing of global imports from China as

$$s_{RoW}^{m,CNY} = \frac{\sum_i M_{i,CHN}^{CNY}}{\sum_i M_{i,CHN}}. \tag{C.2}$$

Under bilateral consistency $X_{CHN,i}^{CNY} = M_{i,CHN}^{CNY}$ and $X_{CHN,i} = M_{i,CHN}$, we have that $s_{RoW}^{m,CNY} = s_{CHN}^{x,CNY}$. Against this background, the share of CNY in China's cross-border export settlement, $\sigma_{CHN}^{x,CNY}$, is a useful proxy for the share of China's exports invoiced in CNY $s_{CHN}^{x,CNY}$ if $\sigma_{CHN}^{x,CHN} \approx s_{RoW}^{m,CNY}$.

Unfortunately, there are two complications in our dataset that make it difficult to check if $\sigma_{CHN}^{x,CHN} \approx s_{RoW}^{m,CNY}$ directly. First, we do not have information on the share of CNY invoicing in *all* countries' imports. This means that in order to calculate global CNY-invoiced imports from China we have to make some assumption on CNY invoicing shares for the countries that are not in our dataset and the country-years in our dataset for which we have information on US dollar or euro but not on CNY invoicing. For this reason, we cannot verify global consistency of CNY-invoiced exports of China and imports from China. Instead, we can only determine under which additional assumption such global consistency would hold, and then apply judgment to evaluate whether this additional assumption is plausible or not.

Denote the set of countries for which we have (do not have) CNY import invoicing information in our dataset by $\mathcal{A}$ ($\mathcal{N}$). Then, Equation (C.2) can be rewritten as

$$\begin{aligned} s_{RoW}^{m,CNY} &= \frac{\sum_{i\in\mathcal{A}} M_{i,CHN}^{CNY}}{\sum_i M_{i,CHN}} + \frac{\sum_{i\in\mathcal{N}} M_{i,CHN}^{CNY}}{\sum_i M_{i,CHN}} \\ &= \frac{\sum_{i\in\mathcal{A}} M_{i,CHN}}{\sum_i M_{i,CHN}} \times \frac{\sum_{i\in\mathcal{A}} M_{i,CHN}^{CNY}}{\sum_{i\in\mathcal{A}} M_{i,CHN}} + \frac{\sum_{i\in\mathcal{N}} M_{i,CHN}}{\sum_i M_{i,CHN}} \times \frac{\sum_{i\in\mathcal{N}} M_{i,CHN}^{CNY}}{\sum_{i\in\mathcal{N}} M_{i,CHN}} \\ &= \omega_{CHN,\mathcal{A}}^{m} \times s_{\mathcal{A}}^{m,CNY} + \omega_{CHN,\mathcal{N}}^{m} \times s_{\mathcal{N}}^{m,CNY}. \end{aligned} \tag{C.3}$$

Analogous to the ideal case, the share of CNY in China's cross-border export settlement $\sigma_{CHN}^{x,CNY}$ is a useful proxy for the share of China's exports invoiced in CNY $s_{CHN}^{x,CNY}$ if $\sigma_{CHN}^{x,CHN} \approx \omega_{CHN,\mathcal{A}}^{m} s_{\mathcal{A}}^{m,CNY} + \omega_{CHN,\mathcal{N}}^{m} s_{\mathcal{N}}^{m,CHN}$. However, given that we cannot calculate $s_{\mathcal{N}}^{m,CNY}$, we can only ask whether the implied share of CNY in import invoicing for those countries for which we do *not* have information in our

dataset

$$s_{\mathcal{N}}^{m,CNY} = \frac{\sigma_{CHN}^{x,CHN} - \omega_{CHN,\mathcal{A}}^{m} \times s_{\mathcal{A}}^{m,CNY}}{\omega_{CHN,\mathcal{N}}^{m}}, \tag{C.4}$$

would have to be implausibly large (or small) in order for the share of CNY in China's cross-border export settlement $\sigma_{CHN}^{x,CNY}$ to be a useful proxy for the share of China's exports invoiced in CNY $s_{CHN}^{x,CNY}$, that is for $s_{CHN}^{x,CNY}$ if $\sigma_{CHN}^{x,CHN} \approx \omega_{CHN,\mathcal{A}}^{m} s_{\mathcal{A}}^{m,CNY} + \omega_{CHN,\mathcal{N}}^{m} s_{\mathcal{N}}^{m,CHN}$.

The second complication is that we only have information on CNY invoicing in countries' *total* imports M_i^{CNY} in our dataset, but not on CNY invoicing in countries *bilateral* imports from China $M_{i,CHN}^{CNY}$, which we need to calculate $s_{\mathcal{A}}^{m,CNY} \equiv \sum_{i \in \mathcal{A}} M_{i,CHN}^{CNY} / \sum_{i \in \mathcal{A}} M_{i,CHN}$ in Equation (C.4). We therefore make the assumption that CNY invoicing occurs only in bilateral trade with China, that is we assume $M_{i,j}^{CNY} = 0$ for $j \neq CHN$ and hence that $M_{i,CHN}^{CNY} = s_i^{m,CNY} M_i$; note that this stacks the deck in favor of China's trade settlement currency being a useful proxy for trade invoicing currency, as it allocates the maximum possible amount of CNY invoicing of countries' imports from the entire rest of the world to imports from China (and hence exports of China).

The green dashed line in the left panel in Figure A.2 presents the results for the implied value of the CNY import invoicing share $s_{\mathcal{N}}^{m,CHN}$.

PUBLICATIONS

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