Creating an Alternative?

The Impact of Ukraine War Sanctions on Renminbi Internationalization

Julian Wendt

Abstract:

The Chinese currency renminbi and its potential to compete with other international currencies, such as the US dollar and the euro, is the subject of an intense and ongoing debate. This working paper investigates whether sanctions imposed as a reaction to the Ukraine war accelerated the process of renminbi internationalization. It tests whether international sanctions drive governments and private actors wary of dollar and euro dominance over the international financial system toward the renminbi as an alternative currency. To test the hypothesis and give a detailed overview of the current status of renminbi internationalization, this working paper compiles the functions international currencies fulfill for private and official actors. It then employs the interrupted time series regression method to trace the impact of Ukraine war sanctions on the renminbi. The results indicate that international sanctions overall did not lead to increased popularity of the renminbi. Instead, the renminbi is used less as a reserve currency and for investment purposes. As a means of payment, sanctions did not have a big impact, although renminbi currency swap lines and renminbi trade finance have seen an increase in popularity.

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1. Introduction

From the era of the planned economy to the time of reform and opening and the following decades, the renminbi (RMB), along with the transformation of the Chinese economy, has undoubtedly gained strength and popularity. The trend of the RMB increasingly circulating outside of China and advancing to become an international currency, coined the "internationalization" of the RMB, pronounces itself in the increased usage of the currency in global trade, investment, and as a reserve currency. Since the Chinese government began actively supporting this development in 2008, this process found considerable attention in the realms of political science and economics as a switch from the current dollar-dominated financial system ("dedollarization") to a multipolar system with two or more prevalent currencies would have immense consequences for the global economy and international relations.

The internationalization of the RMB is mostly viewed as a project actively driven forward by the Chinese government and meant to increase financial independence and influence on other countries (Chey et al. 2019, p. 2403). Internationalizing a currency brings further advantages, namely a better reputation for the country issuing the currency, reduced transaction costs, and the increased benefit of seigniorage (meaning the revenue generated through the difference between the cost of producing money and the value of the money produced) (Cohen 2019, p. 51-52). However, requirements for a currency to become truly internationalized are high, and there are good reasons for the current dominance of the US dollar. It remains unclear whether China is willing to fully expose its economy to the risks linked to currency internationalization, i.e., appreciation of the RMB and less macroeconomic flexibility (Cohen 2015, p. 23-24). Thus, significant hurdles to RMB internationalization remain because the Chinese government retains restrictions on its financial system. Research on the RMB focuses on what factors (external and internal, economically and politically) accelerate or impede its internationalization. International financial sanctions imposed by countries issuing competing currencies are among the factors understood to drive RMB internationalization. The Ukraine war is perhaps the most striking example of the US, the EU, and other G7 countries using the dominant position of their currencies and financial infrastructure to isolate a country from much of the global financial system. It is unclear if these sanctions pave the way for the RMB to establish itself as an alternative or if countries and private entities stick to their trust in the US dollar and euro, British pound and Japanese yen.

This paper investigates the question of what effect sanctions imposed during the Ukraine war had on the internationalization of the RMB. The purpose of this paper is thus twofold. First, it seeks to test the hypothesis that financial sanctions imposed by Western countries drive RMB internationalization forward. Second, it aims to provide a comprehensive overview of the current state of RMB internationalization, incorporating all available indicators and data.

Chapter 2 will present the existing literature on this topic. The third chapter will outline criteria and relevant instruments for RMB internationalization based on the theoretical literature regarding the functions of international currencies and international currency competition. The chapter subsequently illustrates how sanctions impair Russia's ability to use the US dollar, other international currencies, and financial infrastructure and makes the case for the hypothesis that these sanctions lead to an acceleration of RMB internationalization. Chapter 4 then presents data sources and the method of interrupted time series analysis which is used for testing the hypothesis. Following the presentation of results in the fifth chapter, the final chapter concludes that the Ukraine war sanctions did not result in increased global usage of the RMB. On the contrary, the RMB is being used less in investment and as a reserve currency and could only barely increase its global standing as a means of payment. Hence, the RMB still lacks far behind the US dollar, the euro, and even the British pound and Japanese yen.

2. Internationalization of the RMB

In the wake of the 2008 financial crisis, the decision of the Chinese government to take first steps toward allowing cross-border use of the RMB found international recognition (Yu 2015, p. 71). Even though scholars were ready to point out the limitations of the RMB and the Chinese financial system, the weakness of the US dollar after the 2008 financial crisis and the euro after the European debt crisis caused many to be optimistic about RMB internationalization. This led to predictions of the US dollar losing its position as the 'reigning currency' and becoming a less important currency within a tripolar financial system with the euro and the RMB being equally relevant (European Central Bank 2012, p. 11; World Bank 2011, p. 125-126; Kirshner 2014, p. 16). Despite these optimistic outlooks, the pace of RMB internationalization was slower than most scholars predicted. While the Western world was recovering from the financial crisis, a capital market crisis struck the Chinese financial system in 2015. This event prompted scholars to refocus on the challenges of establishing an international currency, particularly within a restricted Chinese economy (Subacchi 2017; Prasad 2017; Li, Zhang 2017). Also in 2015, the International Monetary Fund (IMF) nevertheless announced the inclusion of the RMB in the basket of international currencies determining the value of its Special Drawing

Rights – the international reserve assets of the IMF. This decision was interpreted as an acknowledgment of the RMB's increasing international status as a reserve currency (Wei 2020, p. 476-478). Furthermore, the Chinese government continuously introduced pilot projects, initiatives, and financial infrastructure aimed at promoting the international use of the RMB, leading to an ongoing debate on the success and failure of these initiatives and the economic and political conditions necessary for RMB internationalization.

Scholars focusing on the political factors underlying cross-border use of the RMB see an increasing need for China to push RMB internationalization and also for other countries and private actors to increasingly use the RMB. For example, Helleiner and Kirshner (2014), as well as Liao and McDowell (2016), argue that RMB internationalization is a matter of international orders, finding that political and ideological closeness to China and distance to the US leads to increased usage of the RMB as a reserve currency. With increasing global polarization between the US and China and China widening its sphere of influence through programs like the Belt and Road Initiative (Cai 2022, p. 3421-3422) or increased cooperation with the ASEAN states (Chao 2016, p. 411-412), certain countries and private entities increasingly find the RMB attractive. Similarly, Wei (2017) argues that currencies on the route to internationalization, first and foremost, require a political foundation, i.e., a network of monetary partners and a system of international institutions providing "non-market" protection.

Economists have a more skeptical outlook on the internationalization of the RMB, stressing factors like the size of the trading network, the liquidity in financial markets, or the confidence official and private entities have in the currency's value (Wei 2017, p. 116). Criticizing that other studies neglect such factors, Hasegawa (2018) acknowledges the importance of politics but postulates that if China refrains from introducing substantial economic reforms, the RMB could only become a regionally dominant currency if Chinese economic growth persists while the US faces economic distress. The majority of economists writing on RMB internationalization are even less optimistic, arguing that no matter the political and economic circumstances, RMB internationalization is seriously hampered by the restrictions on the Chinese economy. In her book on RMB internationalization, Subacchi (2017) argues that while the RMB has certainly progressed toward internationalization, further progress is limited due to the remaining need for the Chinese government and the People's Bank of China to ensure financial stability and economic growth by restricting investment, centrally setting (low) interest rates, and managing the exchange rate of the RMB. Prasad (2017, p. 130-138) also asserts that Chinese

capital markets lack the depth and liquidity for the RMB to become a globally attractive currency. Eichengreen and Lombardi (2017, p. 49) further cite path dependence, the deep financial and commercial embeddedness of the US economy, and the geopolitical and military weight of the US as reasons for continuous dollar dominance. As Winecoff (2014, p. 109-112) notes, neither the creation of the euro nor the economic rise of the BRICS (Brazil, Russia, India, China, South Africa) countries nor the 2008 subprime crisis turned out to seriously challenge the prominence of the dollar. In the previous century, the British pound even remained the first-ranking currency long after Britain seized to be the leading economic power of the world (Chiţu et al. 2014, p. 225-226).

However, economists and political scientists both attribute a role to financial sanctions. Countries hit by financial sanctions need to look for alternatives to reduce economic harm to their economies. Other countries might even look for these alternatives as a precautionary measure. Thus, financial sanctions imposed by the US and other Western countries are widely seen as drivers of RMB internationalization (McDowell 2021; Roberts et al. 2017, p. 63). However, in making these arguments, previous works have only presented anecdotal evidence. The case of Russia was noted by Arnold (2023, p. 155) and Glenn (2023, p. 109), who recognize the use of a RMB currency swap agreement to circumvent the US dollar after sanctions were imposed as a response to the annexation of Crimea. Furthermore, Kamel and Wang (2019, p. 1135-1137) mention the case of Iran, which accepted RMB for a portion of its crude oil exports after Western countries tightened sanctions in 2012 and Venezuela using the RMB indirectly through oil-backed loans in 2010. Ramaswamy (2022, p. 24) describes sanctions on Russia as a "wake-up call" for other emerging market economies and continues to outline safeguards that other countries might take to protect themselves against Western sanctions. Cipriani et al (2023) observe the creation of multiple financial messaging systems which might undercut the effectiveness of excluding countries from the so far dominant Society for Worldwide Interbank Financial Telecommunication (SWIFT).

This paper further concretizes research about the impact of sanctions on RMB internationalization by examining how global RMB usage changed with the beginning of the Ukraine war. To this end, it tests whether a connection between sanctions and the increasing dominance of the RMB is traceable on a global level.

3. The theory of currency internationalization

3.1 Internationalization across monetary functions

An international currency is a currency used outside of the country that issued it (Liu et al. 2019, p. 77). International currencies offer significant advantages, enabling trade without currency exchange and reducing the impact of fluctuating exchange rates on supply chains. Moreover, international currencies allow for more comparability of prices and debt returns and support the creation of deep and liquid financial markets (Eichengreen et al. 2018, p. 3-5). Typically, international currencies are conceptualized in terms of their function. Whether used domestically or internationally, money serves three essential purposes: medium of exchange, unit of account, and store of value (Cohen 1971, p. 3-4). However, economists identify additional dimensions of international currency usage. Cohen (2015, p. 94-95) highlights the importance of differentiating between the private and official dimensions, each consisting of three sub-dimensions. International currency as a medium of exchange is used by private actors to settle international transactions and by official entities to bring about changes in currency value by intervening in the foreign exchange market. As a unit of account, international currencies are used for denominating international transactions (trade invoicing and other financial transactions) on the private level while being used as an anchor to which governments can peg their currencies on the official level. Currencies are used as a store of value when private actors utilize them for investment purposes. For actors on the official level, international currencies serve as reserve currencies (see Table 1).

Table 1 The Functions of International Currencies

Levels of Analysis	Functions		
	Medium of Exchange	Unit of Account	Store of Value
Private	Foreign Exchange Trading, Payments (Trade Settlement) Trade Finance	Trade Invoicing, Denomination of Financial Transactions	Investment
Official	Intervention	Anchor	Reserve

Source: based on Cohen 2015, p. 9

3.2 Economic and political factors affecting currency internationalization

In the pursuit of internationalization, a currency must compete with other currencies. Consequently, the currency and its issuing country must possess specific political and economic attributes to enhance the currency's attractiveness on the international stage. Economically, it is essential for users to have confidence in the currency's future value (Helleiner 2008, p. 357). Furthermore, the issuing country needs sufficient economic strength to be embedded in the global economy and preside over a large transactional network through which the currency can flow (Chinn/Frankel 2008, p. 8). Lastly, the issuing country should possess a well-developed financial market open to foreign participation, ensuring holders of the currency access to abundant, stable, and diverse investment opportunities. Therefore, the financial market of the issuing country needs depth (the ability to process large orders without large changes in asset prices), breadth (a sufficiently high number of transactions ensuring that buy and sell orders can be processed smoothly), and resilience (the ability to recover quickly from unusually high orders) (Cohen 2015, p. 11). In her classification of currency functions, Susan Strange (1971) considers political factors that influence currency power and identifies four distinct roles occupied by international currencies. She uses the terms "master currencies" which are dominant due to the political dominance of a nation (e.g., colonial powers), "negotiated currencies" which gain traction because issuing countries give benefits to the users of their currencies (e.g., military protection), "top currencies" which are used because the issuing country dominates the financial system, and "neutral currencies" which are attractive simply due to the economic utility they offer (Strange 1971, p. 217). A single currency can simultaneously fulfill multiple roles.

3.3 Important instruments for RMB internationalization

Economists concerned with the internationalization of the RMB note that the structure of the Chinese economy, mainly the remaining financial repression and insufficient capital openness, pose significant challenges to making the RMB attractive. In contrast to competing currencies, the lack of secure and stable investment opportunities disincentivizes official and private actors from using the currency. To compensate for these characteristics of the Chinese financial system, which are meant to protect the Chinese economy from instability and crisis brought about by sudden capital flows, the Chinese government introduced a range of instruments and financial infrastructure aimed at increasing liquidity and promoting the attractiveness of its currency in a controlled fashion:

a) Central bank currency swap lines

Central bank currency swap lines are agreements allowing the exchange of currencies between two central banks. These agreements enable a central bank to obtain liquidity of a foreign currency from another central bank by swapping the currency it issues itself. The obtained money in foreign currency can then be lent to domestic banks (Destais 2016, p. 2253). Swap lines are an essential instrument for internationalizing a currency, not only because they enable the exchange of currencies at a large scale but also because they serve as a tool to de-risk transactions related to the foreign currency. If a domestic bank struggles with dried-up funding of a foreign currency and is thus threatened to default on its obligations, the central bank can step in as a lender of last resort and provide liquidity through the currency swap line (Eichengreen et al. 2018, 184-185). This increases the ability and willingness of banks and private entities to engage in transactions using the foreign currency and – in the case of China – boosts trade (Hao et al. 2020). In addition to such bilateral currency swap lines, multilateral exchange agreements are also possible. In the case of China, the Chiang-Mai Initiative Multilateralization (originally called Chiang-Mai Initiative) is such a multilateral swap line, essential to the integration of the RMB in the ASEAN region (Falianty 2019, p. 12).

b) Interbank communication, clearing, and settlement

An essential part of financial infrastructure is the payment system through which transactions within but, more importantly, across borders are cleared and settled. Financial institutions need to clear transactions and settle payments while messaging systems facilitate communication among banks and between banks and other financial institutions such as clearing houses. In the case of the RMB, a network of offshore RMB clearing banks spread around the world simplifies the clearing and settlement of RMB-denominated transactions. These clearing banks serve as intermediaries, allowing local banks to process RMB-denominated transactions directly with them instead of Chinese correspondent banks that do not share the same language, time zone, or legal framework (Prasad 2017, p. 111-112). Furthermore, RMB clearing banks facilitate access to the RMB by offering RMB loans and holding RMB deposits (Zucker-Marques, da Silva 2022, p. 53-54). To allow for cross-border settlement and clearing of RMB payments, the Chinese government established the offshore RMB real-time gross settlement (RTGS) system,

which enables cross-border payments by processing requests of banks situated outside of mainland China (Subacchi 2017, p. 124-125). Because the offshore RMB RTGS system is situated in Hong Kong, which led to problems with availability across time zones and the use of Roman characters, the People's Bank of China developed a substitute called the Cross-Border Interbank Payment System (CIPS) to provide around-the-clock clearing and settlement services for cross-border payments in RMB (Prasad 2017, p. 114). The establishment of CIPS is relevant because it is not only a settlement and clearing system but also a messaging system for interbank communication analogous to the network of the Society for Worldwide Interbank Financial Telecommunication (SWIFT) and could thus serve as a mechanism for China and other countries to circumvent sanctions involving SWIFT (Cipriani et al. 2023, p. 49).

c) Capital Markets and Investment

As mentioned above, open capital markets are essential for the internationalization of a currency. Even though an expansion of RMB investment opportunities creates an incentive to hold RMB (Chey 2013, p. 349), the Chinese government is wary of international volatility and speculation destabilizing the Chinese financial markets and pursues a "balance between development and security" (PBOC 2021, p. 4) by only gradually opening its capital account. The first steps in this direction included the introduction of RMB-denominated bonds. At first, the only offshore marketplace for RMB-denominated bonds ("dim sum bonds") was in Hong Kong, but other financial centers (most prominently London and Taipei) were added subsequently (Fung et al. 2013, p. 7). Moreover, foreign entities increasingly have the opportunity to issue so-called RMB-denominated "panda bonds" directly in the Chinese on-shore bond market (Zhang 2022, p. 191-192). To encourage further investment of RMB in stocks and different kinds of funds, Beijing introduced several schemes and programs, such as the qualified foreign institutional investment scheme (QFII) for buying and selling certain RMB-denominated shares or the renminbi-foreign direct investment program (R-FDI) for foreign direct investment with RMB in mainland China (Subacchi 2017, p. 130-131).

3.4 The effect of sanctions

The plethora of factors determining the competitiveness of a currency (see Chapter 3.2) reveal that sanctions can potentially shift the playing field in the competition of international currencies. As demonstrated by the case of Russia after the Ukraine war (see Chapter 4), international financial sanctions imposed by the US and allies can lead to countries and private actors being unable to access essential financial markets and financial infrastructure, thus incentivizing

them to hold and use alternative currencies that offer more opportunities for investment and payment. A similar effect can be hypothesized for the effect of trade sanctions which exclude countries from trading networks and might lead them to join other networks with other dominant currencies (McDowell 2023, p. 26-31). Finally, as other countries and private entities become aware of the economic risks associated with using the dollar and euro, these currencies might lose a significant portion of their economic appeal (Ramaswamy 2022, p. 24). To use the typology of Susan Strange (1971), sanctions can lead to international currencies like the euro and the dollar losing their prominence as top currencies, because other alternative financial infrastructures and markets gain traction. Additionally, they might lose their appeal as neutral currencies, with official and private entities increasingly viewing them as economically risky.

According to scholars like McDowell (2021) and Roberts et al. (2017, p. 63), current trends of "de-dollarization" can already be traced back to the US (over)using sanctions due to its superior position in the financial world. Because of the increasing willingness of the US and its allies to exclude countries, companies, or people from (parts of) the global financial system for political reasons, entities that are hit, threatened to be hit or feel threatened actively push for de-dollarization and an alternative to current US primacy in the financial system (Drezner 2015, p. 761). Due to this development, not only countries directly affected by sanctions, but also countries that have political differences with the US might refuse to use the dollar across the three monetary functions (means of exchange, unit of account, store of value) when possible or at least when economically convenient (McDowell 2023, p. 14-16).

3.5 The Ukraine war as a potential turning point

Whereas the annexation of Crimea by Russia in 2014 had already prompted financial sanctions on Russia by the EU and G7 countries, the full-scale invasion of Ukraine in 2022 led to "an unprecedented array of financial and economic sanctions" (Arnold 2023, p. 154) aimed at cutting Russia off the financial system and ultimately preventing it from financing its war. Simultaneously, the EU, the US, and other countries also sanctioned Russian ally Belarus. An overview created by the Peterson Institute for International Economics (2023) shows that the sanctions affected Russia's use of the dollar alongside the other international currencies euro, pound sterling, and yen as a medium of payment and store of value. Sanctions were accompanied with the threat of secondary sanctions against states deemed to be willing to support Russia. Ac-

cording to scholars like Ramaswamy (2022, p. 24), this changes not only the behavior of countries directly affected by the sanctions but also serves as a wake-up call for other countries that might begin to alter their usage of international currencies to increase their financial security. Sanctions on Russia exposed vulnerabilities across the three monetary functions:

a) Medium of exchange

Banning several Russian banks from the SWIFT system meant that international transactions with Russian banks became impossible or at least much harder. Furthermore, sanctions hit trade with Russia and thus indirectly affected the usage of the US dollar and other international currencies as a medium of exchange. Dollar transactions with Russian banks, for example, to pay back dollar-denominated debt, were halted in multiple cases or forbidden outright. Besides these sanctions affecting the use of international currencies as a medium of exchange on the private level, the European Commission and the G7 countries also announced that it would impose measures (e.g., asset freezes) preventing the Russian Central Bank from deploying international reserves to intervene in the foreign exchange market and stabilize the ruble (European Commission 2022; US Department of the Treasury 2022).

b) Unit of account

Imposing sanctions to directly prevent Russia from using the dollar as a unit of account is not feasible. However, the price of goods and services is often denominated in the currency that is then also used for trading them (Doepke, Schneider 2017, p. 1537-1538). Thus, the strict limitations on using the dollar and euro as a medium of exchange possibly influence their usage as a unit of account on the private level. On the official level, using an international currency, such as the dollar, as an anchor to peg a currency to is a domestic decision that international sanctions cannot affect. However, Russia did not peg the ruble to the dollar but resorted to other measures to stabilize the value of its currency after invading Ukraine.

c) Store of Value

Russian private entities were barred from using the dollar as a store of value through a range of sanctions. For instance, the EU disallowed selling securities to Russian nationals, people residing in Russia, or entities established in Russia. Additionally, it heavily restricted investment and credit-related transactions with numerous Russian banks and prohibited financial institutions from accepting deposits exceeding EUR 100,000 from Russian nationals or entities. Moreover, the EU and G7 countries froze assets of the Russian Central Bank valued at 300 billion dollars and prohibited transactions related to the management of currency reserves.

These measures strongly limited the ability of Russia to use the dollar (as well as the euro and other international currencies) as a store of value on the private level and effectively stopped the use of the currency as a store of value on the official level.

4. Tracking RMB internationalization after the beginning of the Ukraine war

4.1 Indicators of RMB internationalization

This paper aims to investigate the effect of sanctions imposed in the wake of the Ukraine war on the internationalization of the RMB. To achieve this goal, relevant indicators related to RMB internationalization need to be compiled and progress should be monitored over time. However, Kotarski and Tan (2020) point out that there is a scarcity of literature on currency power measurement and rely on only three indicators to measure currency internationalization: the share of the currency in the world's foreign exchange reserves, the share of the currency in the world's private foreign exchange transactions, and the share of the currency in the world's cross-border banking claims. Their currency internationalization index is based on Norloff (2014, p. 1048), who only considers official reserves and private foreign exchange transactions. In his book on the internationalization of the RMB, Prasad (2014, p. 255-262) compiles data on the progress of internationalization but does not distinguish between factors relevant to Chinese monetary capability (e.g., share of global GDP, share in world trade, investment position) and indicators illustrating RMB internationalization (e.g., global foreign exchange market turnover, offshore RMB clearing arrangements, central bank swap arrangements). Similarly, PBOC reports on RMB internationalization contain a wide range of indicators that influence but do not directly depict RMB internationalization. Furthermore, the PBOC publishes its indicators in absolute terms and refrains from comparing the performance of the RMB to competing currencies (see, for example, PBOC 2022).

Because the literature does not provide a complete compilation of relevant indicators, this paper develops them based on the theoretical literature on international currencies and their functions. If a currency finds increased international use across its monetary functions (see Table 1), it becomes more internationalized. In adopting this assumption, the development of the RMB across the monetary functions will be traced as closely as the available data allows. Moreover, the paper will take into account the unique characteristics of the Chinese economy and its currency. It will investigate whether the instruments associated with the internationalization of the RMB, such as currency swap lines, Chinese clearing and settlement services, and RMB-denominated bonds and other assets, are experiencing a growing utilization over time.

4.2 Data sources

To illustrate RMB internationalization, this paper compiles data on RMB usage across monetary functions (see Table 2). However, as Cohen 2015 (p. 143) points out, quantitative data on some currency functions are unavailable. These functions include foreign exchange market interventions on which governments do not publish data and currency pegs (except for hard pegs, which indicate a complete alignment of exchange rates but are irrelevant in the case of the RMB). Furthermore, data collection is restrained by the focus on the Ukraine war which requires that data be collected in short timeframes (yearly, quarterly, or monthly) and published for the year 2022 and ideally also 2023. Apart from data on foreign exchange trading, which the Bank for International Settlements compiles only triennially, and on trade invoicing, where data is only available till 2019 (Boz et al. 2022), this is the case for all the data on international RMB usage. This means that the internationalization of the RMB can be effectively tracked across two of the three monetary functions. In addition to data on RMB usage, it is also necessary to compile data on global indicators, so that RMB usage can be examined in relative terms. Illustrating the development in both absolute and relative terms allows for a comparison between the RMB and competing currencies. For example, comparing the value of RMB-denominated bonds held outside of China to the size of the global bond market ensures that changes stemming from global economic ramifications of the Ukraine war (such as a shrinking of the global bond market) are not misconstrued as a step backward for RMB internationalization. To gain insights into the popularity of instruments introduced to foster RMB internationalization, data on the Chinese payment systems CIPS and RTGS, and central bank currency swap lines are also examined.

Table 2 Data Sources

Levels of Analysis	Functions		
	Medium of Exchange	Unit of Account	Store of Value
Private	**Global Payments** ➢ SWIFT RMB Tracker (January 2019 - May 2023) **CIPS** ➢ PBOC Payment Systems Report [支付体系运行总体情况] (2018 Q1 - 2022 Q4) **RTGS** ➢ Hong Kong Interbank Clearing Limited **Trade Finance** ➢ SWIFT RMB Tracker (January 2019 - May 2023)	**Trade Invoicing** data unavailable **Denomination for Financial Transactions** data unavailable	**Bonds** ➢ PBOC Money and Banking Statistics ➢ Bank for International Settlements Debt Securities Statistics **Equities** ➢ PBOC Money and Banking Statistics ➢ World Federation of Exchanges (Market Capitalization) **Loans and Deposits** ➢ PBOC Money and Banking Statistics ➢ Bank for International Settlements Consolidated Banking Statistics
Official	**Intervention** **Currency Swap Lines:** ➢ PBOC China Monetary Policy Implementation Report 2019-2023 (published quarterly) [中国货币政策执行报告]	**Anchor** data unavailable	**Reserve** ➢ IWF Global Currency Reserves

4.3 Method

To capture the impact of the Ukraine war on RMB internationalization, this paper applies the interrupted time series regression method, which is often used for examining the impact of policy interventions. In an interrupted time series design, a time series (i.e., a continuous sequence of observations across time) is interrupted at the time of the intervention. The previous data points are used to predict the expected continuing of the trend if the intervention would not occur (counterfactual). The counterfactual is then compared to the actual development after the interruption (Bernal et al. 2017, p. 349). Interrupted time series analysis statistically captures the effect of an intervention by creating a dummy variable X that takes the value 0 before the intervention and increments by 1 for every timepoint after the intervention. With this

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dummy variable, one can use the regression formula $Y_t = \beta_0 + \beta_1 T + \beta_2 X_t$, with Y representing the dependent variable, β_0 representing the baseline level at the beginning of the time series, T representing the time, and X being the dummy variable. A statistically significant result indicates a positive or negative effect of the intervention on the dependent variable. Thus, the result tends to be significant if the prediction (counterfactual) is inaccurate.

One of the advantages of interrupted time series analysis is the simplicity of visual analysis. The effect of the Ukraine war is depicted by plotting the dependent variable and creating a trendline for the counterfactual. This trendline (grey) is the result of regressing the dependent variable against the time ($Y_t = \beta_0 + \beta_1 T$). To demonstrate the accuracy of the prediction, a 95% confidence interval (light grey) is applied. The actual development can be illustrated by creating another trendline (blue) based on a regression with the dummy variable X as the only independent variable ($Y_t = \beta_0 + \beta_1 X_t$). A strong disparity between the grey trendline displaying the counterfactual and the blue trendline illustrating the trend after the interruption indicates a significant result.

5. Results

The results show a clear impact of the Ukraine war across most of the indicators. However, they do not indicate that – as hypothesized – the Ukraine war drove the internationalization of the RMB forward. This can be observed for a few indicators, while the opposite holds true for others.

5.1 RMB as an international medium of exchange

On the private level, international currencies serving as a medium of exchange are used in the foreign exchange market, for settling trade transactions, as well as in trade finance. As mentioned in the previous chapter, data on the foreign exchange market is only collected triennially and, therefore, cannot be included in the analysis because the impact of the Ukraine war is not traceable. Looking at the role of the RMB in global payments made through the SWIFT system, the beginning of the Ukraine war did not result in increased international relevance of the Chinese currency. Instead, the development has been stagnant with the share of the RMB as a payment currency fluctuating around the two percent mark except for a big jump right before the beginning of the Ukraine war.

Figure 1: RMB share of global payments
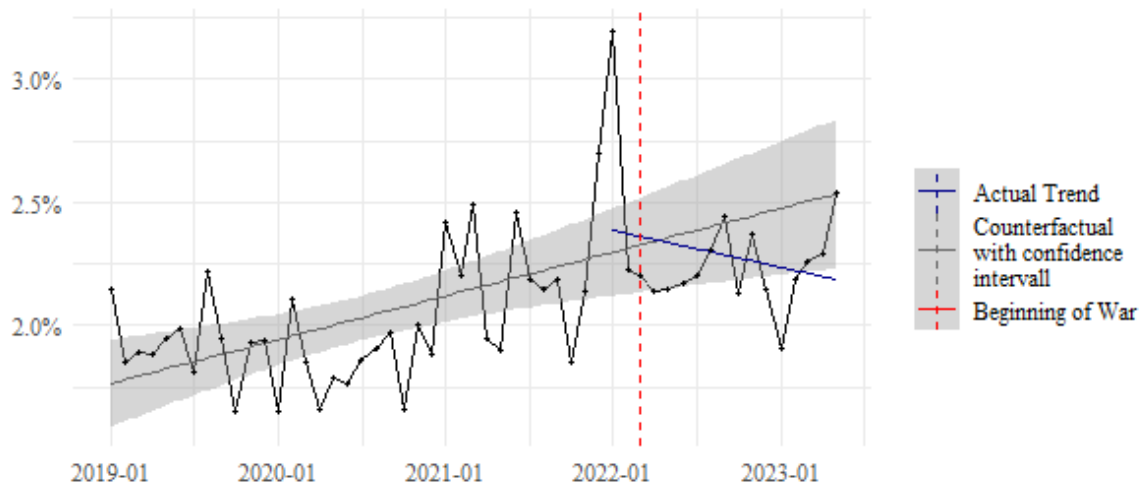
Even though the RMB continues to only play a minor role in global payments, Chinese financial infrastructures seem to slowly gain traction internationally, with both the CIPS and the offshore RMB RTGS system being used increasingly, though still at a low level. In the fourth quarter of 2022, the CIPS processed an average of 22,500 transactions daily, while the RMB RTGS system marked a daily average of 31,000 transactions. In comparison, the SWIFT system averaged roughly 45 million daily messages in the last quarter of 2022. The increasing volume of payments made through the infrastructure provided by China seems to be a long-term development, with the Ukraine war not leading to an easily recognizable acceleration or downturn in both cases.

Figure 2: Payments made through CIPS (figures in trillion RMB)
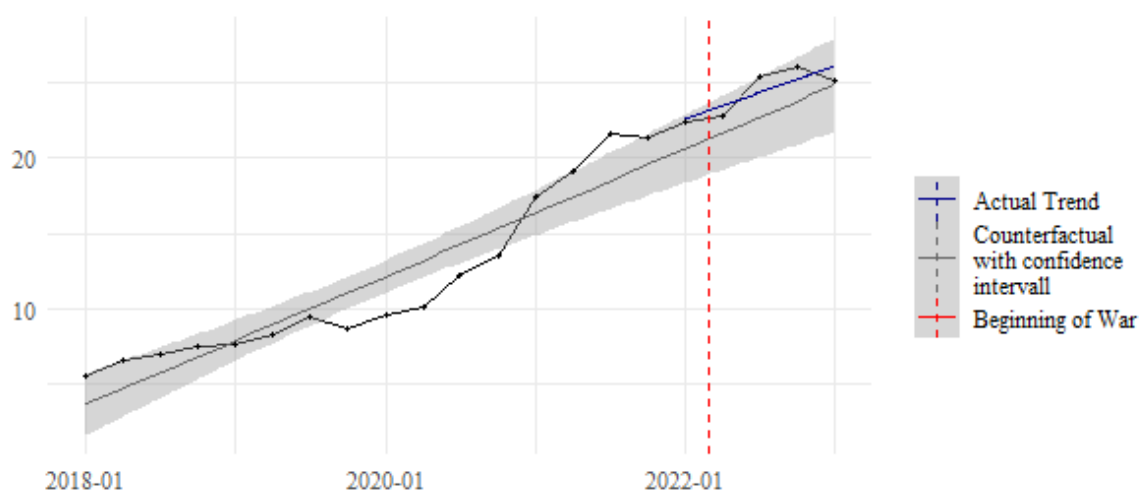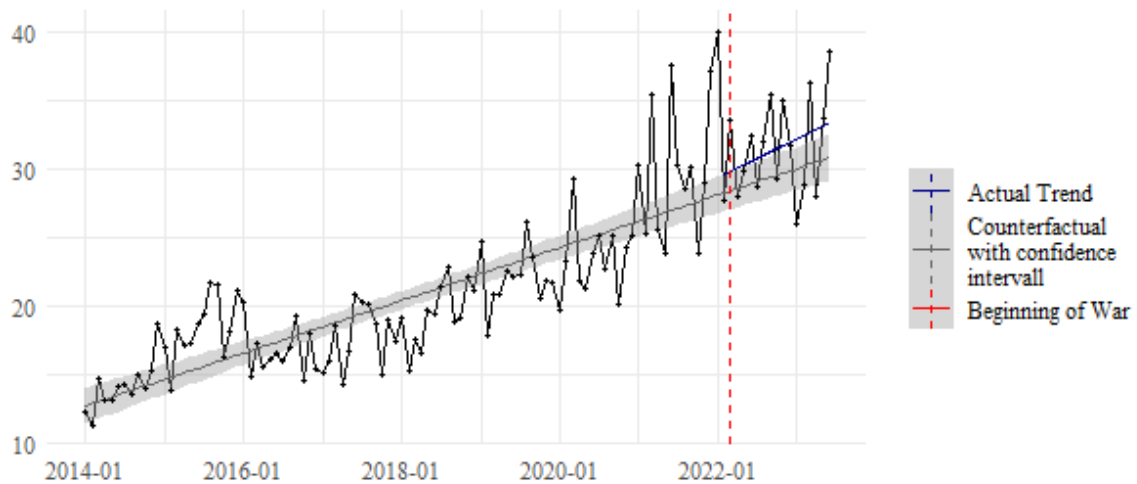
Figure 3: Payments made through the offshore RMB RTGS system (figures in trillion RMB)


An examination of the role of the RMB in trade finance reveals a clear shift after the onset of the Ukraine war. The term trade finance describes financial transactions aimed at facilitating and de-risking international trade transactions. Trade finance thus consists of insurance against the scenario that either importer or exporter cannot fulfill the obligation and short-term loans that banks or other providers offer as collateral (Ahn et al. 2011, p. 298). An increasing role of the RMB in international trade finance signifies that more private actors have turned to the RMB to insure trade transactions after the onset of the Ukraine war. However, as of June 2023, the RMB still only occupies the third rank with a share of 4.9% in the trade finance market, following the euro (6.22 %) and the US dollar (83.92 %). The increase in RMB usage in trade finance could, but does not necessarily imply that the RMB is becoming more important to trade settlement overall (Boz et al. 2022, p. 4).

Figure 4: RMB share in trade finance market
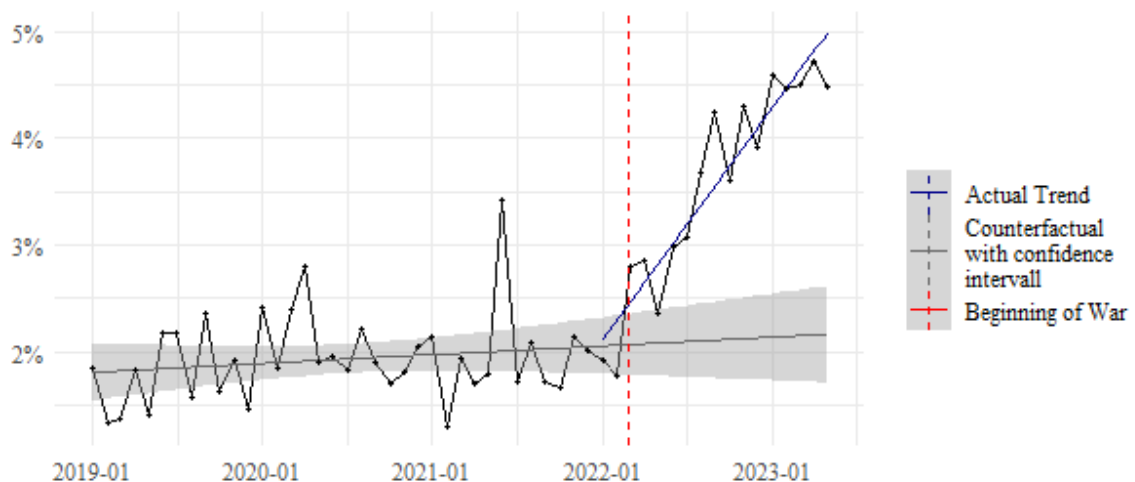
Although data on the use of currencies as a means of intervention is scarce, usage of central bank currency swap lines can be perceived as an indicator of the RMB's relevance in this area. Currency swap lines do not classify as instruments to intervene in the foreign exchange market in order to bring about an appreciation or depreciation of a currency. However, they are instruments for central banks to intervene in the domestic economy and stabilize the domestic financial sector by engaging in swap transactions with other central banks (see Chapter 3.3). In this function, the RMB and the PBOC seemed to gain importance, especially after the beginning of the Ukraine war, as the volume of transactions through central bank currency swap lines increased from 615 billion RMB in the last quarter of 2021 to over a trillion RMB in the first quarter of 2023.

Figure 5: RMB swapped through central bank currency swap lines (figures in billion RMB)
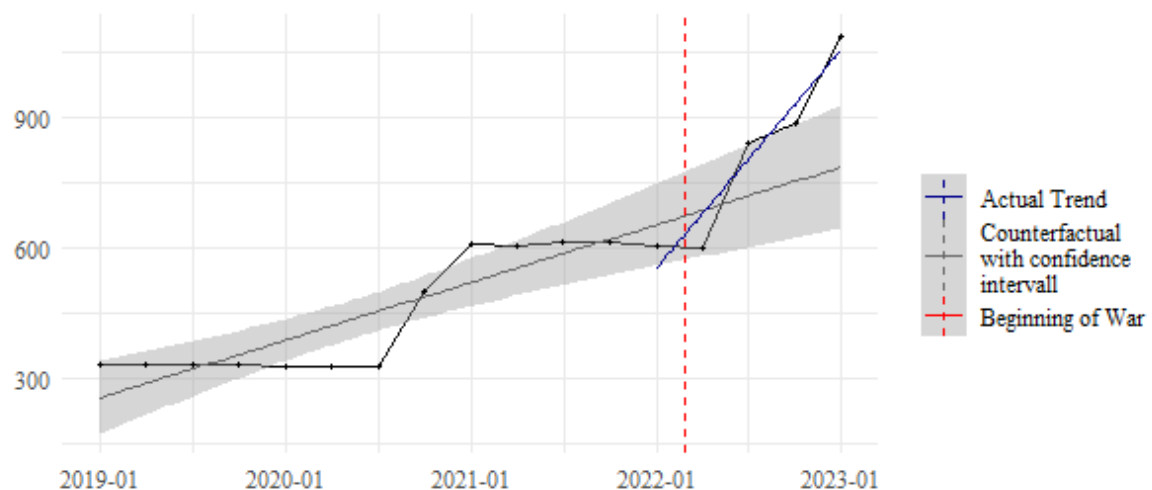
The results of the regression analysis confirm the visual observations. The beginning of the Ukraine war did not produce significant results for the use of RMB in global payments and the use of the CIPS and the RMB RTGS system, which implies that the Ukraine war did not have a big effect on RMB use across these indicators. However, the results for RMB use in trade finance and currency swap lines are significant, indicating that the Ukraine war led to increased popularity of the RMB in these aspects.

Table 3 Regression results for RMB as an international means of payment

	Global Payments	CIPS	RTGS	Trade Finance	Currency Swap Lines
Dependent Variable					
Time	0.014***	1.057***	0.163***	0.008	27.905***
	(0.004)	(0.098)	(0.011)	(0.005)	(6.125)
Effect of Intervention	-0.181	1.699	0.166	0.174***	56.550**
	(0.119)	(1.390)	(0.101)	(0.018)	(19.142)
Constant	1.759***	2.595**	12.538***	1.790***	244.470***
	(0.079)	(0.949)	(0.666)	(0.127)	(47.635)
Observations	53	21	114	53	17
R^2	0.321	0.944	0.755	0.850	0.897
Adjusted R^2	0.294	0.938	0.750	0.844	0.882
Residual Std. Error	0.241 (df = 50)	1.829 (df = 18)	3.311 (df = 111)	0.392 (df = 50)	79.516 (df = 14)
F Statistic	11.814*** (df = 2; 50)	151.581*** (df = 2; 18)	170.575*** (df = 2; 111)	141.848*** (df = 2; 50)	60.645*** (df = 2; 14)

Note: *p<0.1; **p<0.05; ***p<0.01

5.2 RMB as an international store of value

Contrary to the hypothesized effect, the attractiveness of the RMB as an international store of value decreased with the onset of the Ukraine war. This effect can be observed across bonds and equities and on the share of RMB in global currency reserves. The effect on RMB-denominated bonds held by entities outside of China is most obvious. Since the outbreak of the Ukraine war, the volume of these bonds (Dim-Sum Bonds, Panda Bonds) notably decreased after a long period of increasing popularity, starting a negative trend that has not yet been reversed. The change remains when viewing the volume of RMB-denominated bonds held by foreign entities in relative terms, compared to the volume of bonds held globally.

Figure 6: Volume of RMB-denominated bonds held by entities outside China (figures in billion RMB)
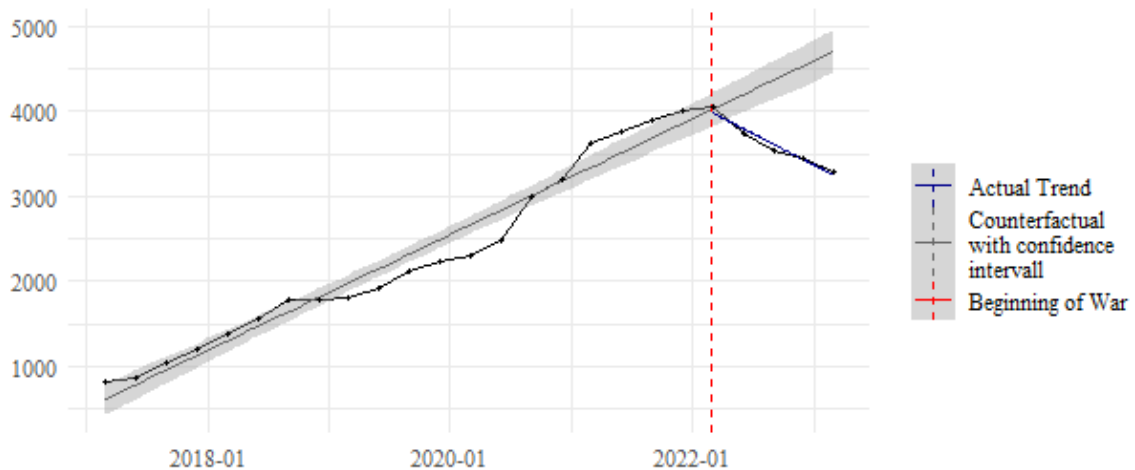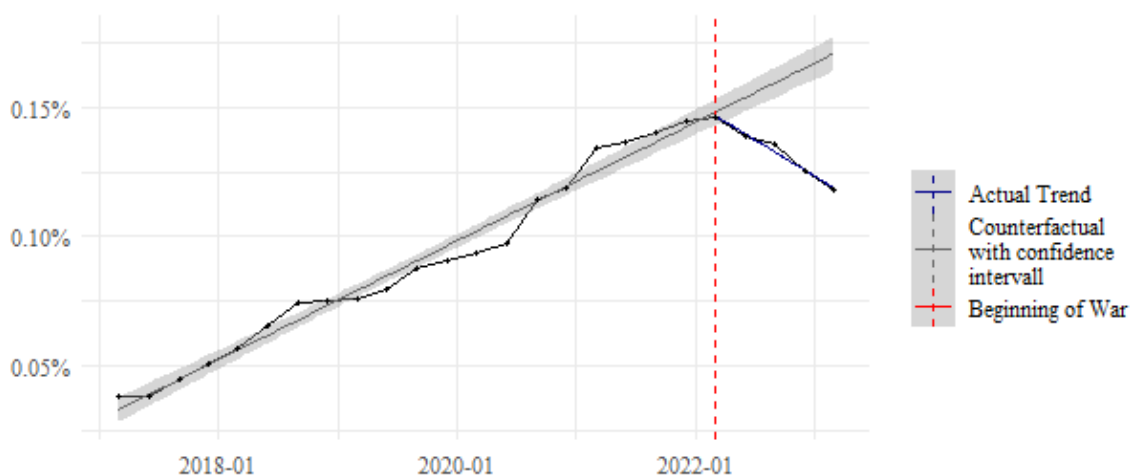

Figure 7: RMB-denominated bonds held by entities outside China compared to bonds held globally

The value of RMB-denominated equities held outside of China also decreased after the beginning of the Ukraine war. The downturn is, however, not as apparent as in the case of RMB-denominated bonds, as the international attractiveness of RMB-denominated equities seems to be more volatile. The regression analysis produces a significant result that supports the assumption that the Ukraine war had an impact on the volume of RMB-denominated equities held outside of China. Nevertheless, the plots show that the increasing trend stopped before the Ukraine war started. This is especially obvious when comparing the value of RMB-denominated equities held outside China to the market capitalization of stock markets that are members of the World Federation of Exchanges.

Figure 8: Value of RMB-denominated equities held by entities outside China (figures in billion RMB)
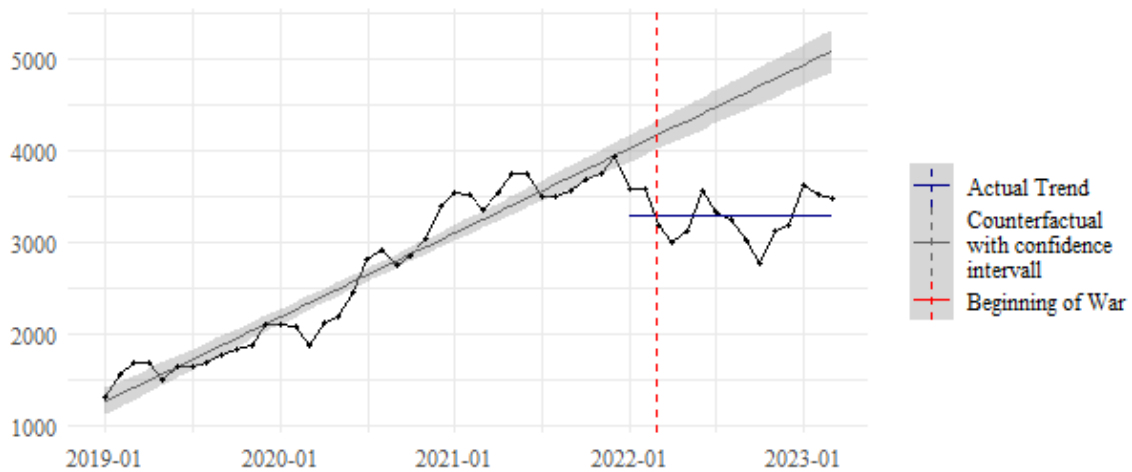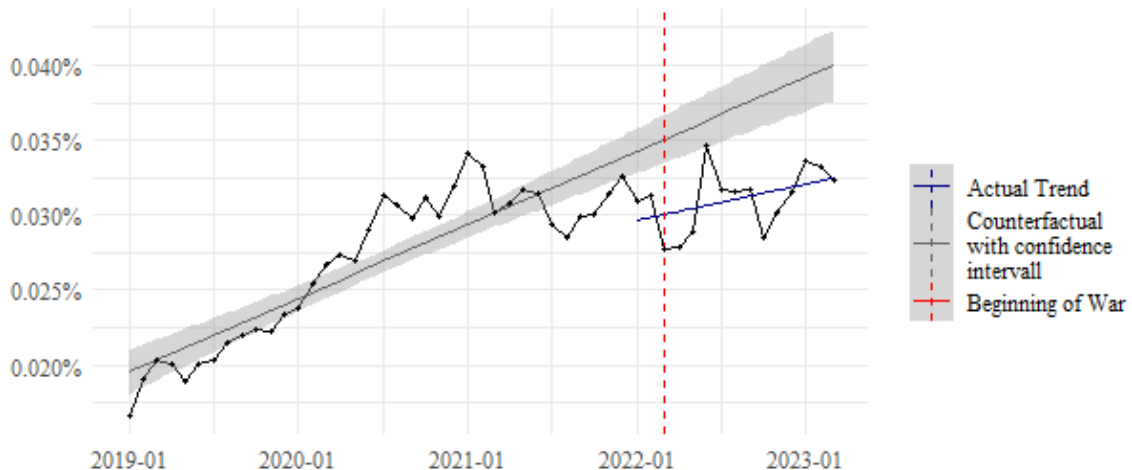

Figure 9: RMB Equities held by entities outside China compared to global market capitalization

Loans and Deposits denominated in RMB and held by entities outside of China continued increasing in popularity, though also at a very low level. In relative terms, that led to an increase as the global volume of loans and deposits declined after the onset of the Ukraine war.

Figure 10: Volume of loans and deposits in RMB held by entities outside China (in billion RMB)
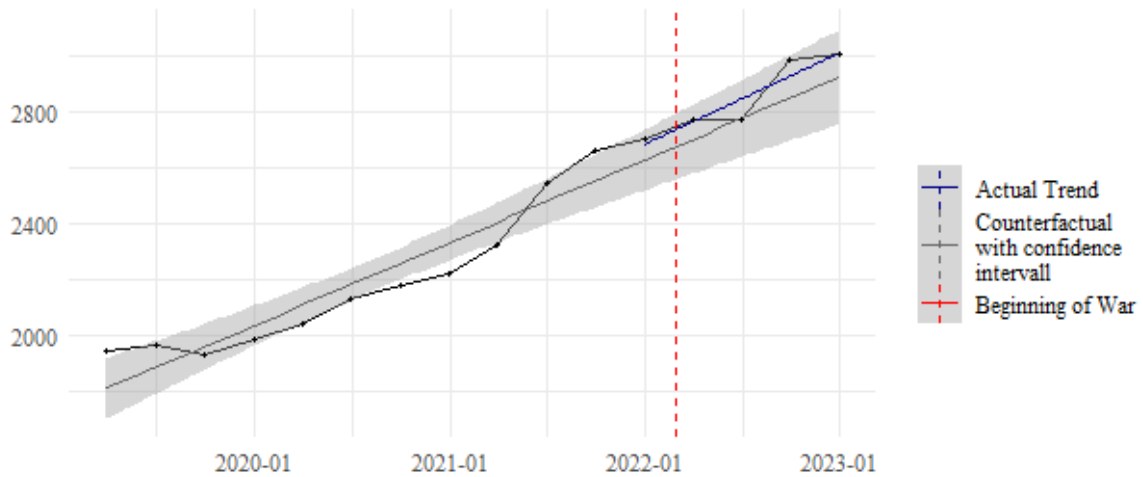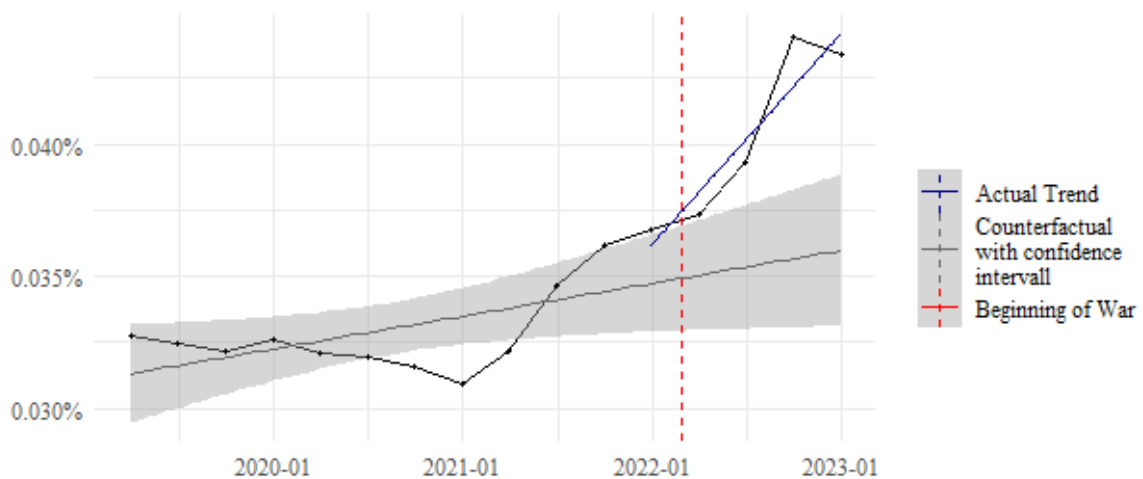

Figure 11: Loans and deposits in RMB held by entities outside China compared to global volume

On the official level, the RMB could also not profit from the Ukraine war. The share of global currency reserves in RMB remained under 3 % behind the dollar, euro, yen, and pound sterling. It slightly decreased after the beginning of the Ukraine war, reversing a long trend of increasing RMB relevance.

Figure 12: Volume of currency reserves in RMB (in billion RMB)
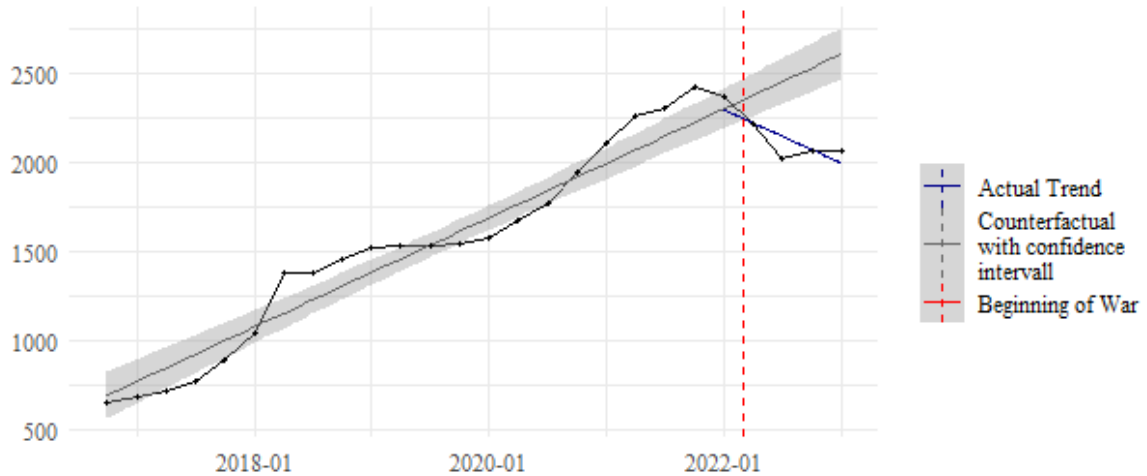
Figure 13: Share of Currency Reserves in RMB
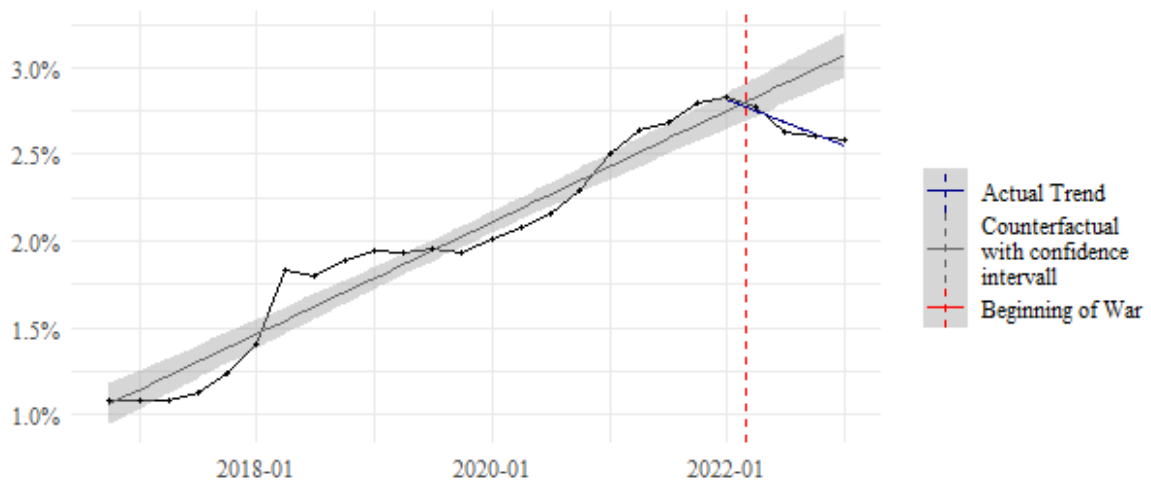
The regression results for the RMB as an international store of value again support the results of the visual analysis. The Ukraine war had a clear impact across almost all of the indicators. Contrary to the hypothesis, this impact is almost always negative. This is especially clear for the popularity of RMB-denominated bonds and RMB currency reserves. Only RMB debt and deposits showed an increase in popularity in relative but not in absolute terms.

Table 4 Regression results for RMB as an international store of value

	Bonds	Bonds (%)	Equities	Equities (%)	Debt and Deposits	Debt and Deposits (%)	Reserves	Reserves (%)
Dependent variable:								
Time	173.785***	0.0001***	682.056***	-0.00000	74.809***	0.00000**	119.661***	0.001***
	(7.102)	(0.00000)	(41.067)	(0.00000)	(6.467)	(0.00000)	(5.222)	(0.00004)
Effect of Intervention	-285.113***	-0.0001***	-1,228.765***	0.00000	24.234	0.00002***	-214.220***	-0.001***
	(37.757)	(0.00001)	(152.740)	(0.00000)	(24.467)	(0.00000)	(29.335)	(0.0002)
Constant	425.792***	0.0003***	13,007.600***	0.0003***	1,733.276***	0.0003***	754.363***	0.009***
	(88.325)	(0.00002)	(958.630)	(0.00002)	(49.626)	(0.00001)	(67.973)	(0.001)
Observations	25	25	51	32	16	16	26	26
R²	0.971	0.981	0.867	0.098	0.961	0.890	0.964	0.958
Adjusted R²	0.968	0.979	0.861	0.036	0.955	0.873	0.961	0.955
Residual Std. Error	193.660 (df = 22)	0.0001 (df = 22)	2,948.619 (df = 48)	0.00002 (df = 29)	82.332 (df = 13)	0.00001 (df = 13)	152.888 (df = 23)	0.001 (df = 23)
F Statistic	361.901*** (df = 2; 22)	558.276*** (df = 2; 22)	155.807*** (df = 2; 48)	1.582 (df = 2; 29)	158.766*** (df = 2; 13)	52.405*** (df = 2; 13)	309.747*** (df = 2; 23)	263.644*** (df = 2; 23)

Note: *p<0.1; **p<0.05; ***p<0.01

6. Conclusion

This paper deals with the question of which effect Ukraine war sanctions had on the internationalization of the RMB. It adopts the interrupted time series regression approach to capture the effect of Ukraine war sanctions on international RMB usage across the monetary functions, thus also illustrating the current state of RMB internationalization. Contrary to the hypothesis that international financial sanctions lead to the RMB increasingly finding popularity as an alternative to currencies like the dollar or euro, the results show that international RMB usage did not increase with the onset of the Ukraine war. This is the case for the RMB as a means of payment (with the notable exception of trade finance and central bank currency swap lines) where the Ukraine war barely affected international usage of the currency. Looking at the RMB as an international store of value, the Ukraine war sanctions impacted RMB internationalization negatively, leading to a decrease in RMB usage in investment and as a reserve currency. These results demonstrate that international sanctions imposed on Russia and Belarus did not lead to an increase in international RMB usage – at least in the short term. Thus, the RMB remains far from seriously challenging the dominance of the dollar and even lacks behind the euro, pound sterling, and yen in many aspects.

The analysis illustrates that the theoretical literature on the effect of international sanctions on the competition of currencies lacks specificity. The results demonstrate that sanctions had an impact on international RMB usage. However, as currencies fulfill multiple functions, international sanctions do not only have one single effect. On the contrary, they can render a currency more popular in certain respects while hampering its popularity in others. Further research should focus on why this is the case, examining how sanctions led to a decrease of trust in the RMB as a store of value but resulted in the increased relevance of RMB currency swap lines and RMB in trade finance. Further research should also shed light on the country-specific impact of sanctions. This paper demonstrated the effects of sanctions on the global level without investigating how the behavior of certain countries or private actors changed. It, therefore, does not rule out a heavy increase in RMB usage across certain countries, such as Russia, as a reaction to the sanctions. Hence, tracing the demonstrated changes back to the countries and actors and observing which

specific sanctions led to what behavioral changes is critical to creating a better understanding of the impact of sanctions on the competition of international currencies.

7. Bibliography

Ahn, Jae Bin; Amiti, Mary; Weinstein, David E. (2011). Trade Finance and the Great Trade Collapse. *American Economic Review;* 101(3), 298–302.

Arnold, Aaron (2023). Curbing China's Resilience to US Coercive Economic Statecraft. *The Washington Quarterly,* 46(1), 153–167.

Bernal, James Lopez; Cummins, Steven; Gasparrini, Antonio (2017). Interrupted time series regression for the evaluation of public health interventions: a tutorial. *International journal of epidemiology,* 46(1), 348–355.

Boz, Emine; Casas, Camila; Georgiadis, Georgios; Gopinath, Gita; Le Mezo, Helena; Mehl, Arnaud; Nguyen, Tra (2022). Patterns of invoicing currency in global trade: New evidence. *Journal of International Economics,* 136(1), 1-16.

Cai, Wanlin (2022) Determinants of the renminbi anchor effect: From the perspective of the belt and road initiative. *Finance and Economics,* 27(3), 3421-3433.

Chao, Wen-Chih (2016). The Political Economy of Cooperation in Renminbi (RMB) Internationalization Between China and the ASEAN States: Opportunity and Challenge. *The Chinese Economy,* 49(6), 400-413.

Chey, Hyoung-kyu (2013). Can the Renminbi Rise as a Global Currency? *Asian Survey,* 53(2), 348–368.

Chey, Hyoung-kyu; Kim, Geun-Young; Lee, Dong Hyun (2019). Which foreign states support the global use of the Chinese renminbi? The international political economy of currency. *The World Economy,* 42(8), 2403–2426.

Chinn, Menzie; Frankel, Jeffrey (2008). Why the Euro Will Rival the Dollar. *International Finance*, 11(1), 49–73.

Chițu, Livia; Eichengreen, Barry; Mehl, Arnaud (2014). When did the dollar overtake sterling as the leading international currency? Evidence from the bond markets. *Journal of Development Economics,* 111(1), 225-245.

Cipriani, Marco; Goldberg, Linda S.; La Spada, Gabriele (2023). Financial Sanctions, SWIFT, and the Architecture of the International Payment System. *Journal of Economic Perspectives,* 37(1), 31-52.

Cohen, Benjamin J. (1971). *The future of the Sterling as an international currency.* London UK: Macmillan.

Cohen, Benjamin J. (2015). *Currency power: understanding monetary rivalry*. Princeton NJ; Oxford UK: Princeton University Press.

Cohen, Benjamin J. (2019). *Currency statecraft: monetary rivalry and geopolitical ambition*. Chicago IL; London UK: The University of Chicago Press.

Destais, Christophe (2016). Central Bank Currency Swaps and the International Monetary System. *Emerging Markets Finance and Trade,* 52(10), 2253-2266.

Doepke, Matthias; Schneider, Martin (2017). Money as a Unit of Account. *Econometrica,* 85(5), 1537-1574.

Drezner, Daniel W. (2015). Targeted Sanctions in a World of Global Finance. *International Interactions,* 41(4), 755–764.

Eichengreen, Barry; Lombardi, Domenico (2017). RMBI or RMBR? Is the Renminbi Destined to Become a Global or Regional Currency? *Asian Economic Papers*, 16(1), 35-59.

Eichengreen, Barry; Mehl, Arnaud; Chiţu, Livia (2018). *How global currencies work. Past, present, and future*. Princeton NJ; Oxford UK: Princeton University Press.

European Central Bank (2012). *The International Role of the Euro*. Available at: https://www.ecb.europa.eu/pub/pdf/ire/euro-international-role201207en.pdf (last viewed 01/08/23).

European Commission (2022). *Joint Statement on further restrictive economic measures*. Available at: https://ec.europa.eu/commission/presscorner/api/files/document/print/en/statement_22_1423/STATEMENT_22_1423_EN.pdf (last viewed 01/08/23).

Falianty, Telisa (2019). Renminbi in ASEAN Economy: How ASEAN responds to Renminbi Internationalization. *Journal of Economic Cooperation and Development,* 40(3), 1-25.

Fung, Hung-Gay; Tzau, Derrick; Yau, Jot (2013). Offshore Renminbi-Denominated Bonds. *The Chinese Economy*, 46(2), 6–28.

Glenn, Caileigh (2023). Lessons in Sanctions-Proofing from Russia. *The Washington Quarterly,* 46(1), 105-120.

Hao, Kaixuan; Han, Liyan; Li, Wei (2022). The impact of China's currency swap lines on bilateral trade. *International Review of Economics & Finance,* 81(1), 173-183.

Hasegawa, Masanori (2018). The geography and geopolitics of the renminbi: a regional key currency in Asia. *International Affairs,* 94(3), 535–552.

Helleiner, Eric (2008). Political determinants of international currencies: What future for the US dollar? *Review of International Political Economy,* 15(3), 354–378.

Helleiner, Eric; Kirshner, Jonathan (2014). *The Great Wall of Money. Power and Politics in China's International Monetary Relations.* Ithaca NY; London UK: Cornell University Press.

Kamel, Maha; Wang, Hongying (2019). Petro-RMB? The oil trade and the internationalization of the renminbi. *International Affairs,* 95(5), 1131–1148.

Kirshner, Jonathan (2014). *American Power after the Financial Crisis*. Ithaca NY: Cornell University Press.

Kotarski, Kristijan; Tan, Alexander C. (2020). Measuring Currency Power from 2005 to 2018. *Politička misao,* 56(3), 241–268.

Li, Cheng; Zhang, Xiaojing (2017). Renminbi Internationalization in the New Normal: Progress, Determinants and Policy Discussions. *China & World Economy,* 25(2), 22-44.

Liao, Steven; McDowell, Daniel (2016). No Reservations: International Order and Demand for the Renminbi as a Reserve Currency. *International Studies Quarterly*, 60(2), 272–293.

Liu, Tao; Wang, Xiaosong; Woo, Wing, Thye Woo (2019). The road to currency internationalization: Global perspectives and Chinese experience. *Emerging Markets Review,* 38(1), 73-101.

McDowell, Daniel (2021). Financial sanctions and political risk in the international currency system. *Review of International Political Economy*, 28(3), 635–661.

McDowell, Daniel (2023). Bucking the buck. US financial sanctions and the international backlash against the dollar. New York NY; Oxford UK: Oxford University Press.

Norrlof, Carla (2014). Dollar hegemony: A power analysis. *Review of International Political Economy,* 21(5), 1042–1070.

People's Bank of China (2021). *RMB Internationalization Report 2021*. Available at: http://www.pbc. gov.cn/en/3688110/3688172/4157443/4433239/2021122809344466286.pdf (last viewed 01/08/23).

People's Bank of China (2022). RMB Internationalization Report 2022. Available at: http://www.pbc .gov.cn/goutongjiao-liu/113456/113469/4666144/2022112809590450941.pdf (last viewed 01/08/23).

Peterson Institute for International Economics (2023). *Russia's war on Ukraine: A sanctions timeline.* Available at: https://www.piie.com/blogs/realtime-economics/russias-war-ukraine-sanctions-timeline (last viewed 01/08/23).

Prasad, Eswar S. (2017). *Gaining Currency. The Rise of the Renminbi.* New York NY, Oxford UK: Oxford University Press.

Ramaswamy, Srichander (2022). The Threat of Financial Sanctions: What Safeguards Can Central Banks Build? *China & World Economy,* 30(3), 23-41.

Roberts, Cynthia A.; Armijo, Leslie Elliott; Katada, Saori N. (2018). *The BRICS and collective financial statecraft*. New York NY; Oxford UK: Oxford University Press.

Strange, Susan (1971). The Politics of International Currencies. *World Politics,* 23(2), 215-231.

Subacchi, Paola (2017). *The People's Money. How China is building a global currency.* New York NY: Columbia University Press.

US Department of the Treasury (2022). Russian Elites, Proxies, and Oligarchs Task Force Joint Statement. Available at: https://home.treasury.gov/news/press-releases/jy0839 (last viewed 01/08/23).

Wei, Li (2017). Partners, Institutions and International Currencies: The International Political Foundations for the Rise of the Renminbi. *Social Sciences in China,* 38(2), 114-141.

Wei, Ran (2020). Influence of SDR on RMB Internationalization. *International Journal of Advanced Engineering, Management and Science,* 11(6), 476–483.

Winecoff, Kindred W. (2014). The Triffin dilemma, the Lucas paradox, and monetary politics in the twenty-first century. In: Handbook of the International Political Economy of Monetary Relations (p. 89-122). Cheltenham UK, Northampton MA: Edward Elgar.

World Bank (2011). *Multipolarity: The New Global Economy. Global Development Horizons 2011.* Available at: https://docments1.worldbank.org/crated/en/597691468150580088/pdf/6269 80PUB0M ult000public00BOX361489B.pdf (last viewed 01/08/23).

Yu, Yongding (2015). Renminbi Internationalization: Achievements, Prospects, and Challenges. In Eichengreen, Barry; Masahiro, Kawai (2015). *Renminbi Internationalization: Achievements, Prospects, and Challenges* (p. 53-82). Washington DC: Brookings Institution Press.

Zhang, Xin (2022). *Accessing the Chinese Bond Market: Panda Bonds.* Singapore: Spring.

Zucker-Marques, Marina; da Silva, Pedro Perfeito (2022). The Role of Institutions: A Cross-country Analysis of Renminbi Trading in Foreign Exchange Markets. *China & World Economy,* 30(3), 42-74.

Data Sources

Bank of International Settlements. *Consolidated banking statistics.* Available at: https://www.bi s.org/statistics/consstats.htm (last viewed 01/08/2023).

Bank of International Settlements. *Debt securities statistics.* Available at: https://www.bis.org/st atistic s /secstats.htm (last viewed 01/08/2023).

Hong Kong Interbank Clearing Limited. *Statistics of Clearing Transaction Volume and Value.* Available at: https://www.hkicl.com.hk/eng/information_centre/statistics_of_clearing_transaction_v olume_and_value.php (last viewed 01/08/2023).

International Monetary Fund. *Currency Composition of Official Foreign Exchange Reserves.* Available at: https://data.imf.org/?sk=e6a5f467-c14b-4aa8-9f6d-5a09ec4e62a4 (last viewed 01/08/2023).

People's Bank of China. *Money and Banking Statistics.* Available at: http://www.pbc.gov.cn /diaochatongjisi/116219/index.html (last viewed 01/08/2023).

People's Bank of China. *Payment Systems Report [支付体系运行总体情况]* (2018 Q1 – 2022 Q4).

People's Bank of China. *PBOC China Monetary Policy Implementation Report 2019-2023 [中国货币政策执行报告]* (2019 Q1 – 2022 Q4).

Society for Worldwide Interbank Financial Telecommunication. *RMB Tracker.* Available at: https://www.swift.com/de/node/11096 (last viewed 01/08/2023).

World Federation of Exchanges. *Statistics Portal.* Available at: https://statistics.world-ex-changes.org/ (last viewed 01/08/2023).