

Is Capital Account Convertibility Required for the Renminbi to Acquire Reserve Currency Status?

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ABSTRACT

It is widely assumed that the renminbi (RMB) cannot acquire a meaningful place in central bank reserve portfolios without full liberalization of China's capital account. We argue that the RMB can in fact develop into a consequential reserve currency in the absence of capital account convertibility. Trade and investment links can drive official use and accumulation despite limited access to Chinese financial markets. But this route to currency internationalization requires policy support. China must allow access to RMB through loans and People's Bank of China (PBoC) currency swaps. It must ensure convertibility of RMB into US dollars on offshore markets. It must provide these RMB services at a stable and predictable price. Currency internationalization without full capital account liberalization thus requires the RMB to be backed by dollar reserves, which the PBoC consequently will continue to hold and use. Hence we do not foresee RMB internationalization as supplanting dollar dominance.

Keywords: International Monetary System, Renminbi, International Reserve Currencies

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NON-TECHNICAL SUMMARY

Why doesn't the currency of the second largest economy in the world play a consequential reserve-currency role? The share of China's renminbi (RMB) in global reserve portfolios, at 2%, pales in comparison with those of the dollar (60%) and the euro (20%). What explains the difference?

A common response is that the RMB cannot develop as an international reserve currency without full liberalization of China's capital-account (Frankel 2011; Prasad 2021). This view is based on the assumption that countries will not hold RMB reserves if they cannot easily purchase and sell them on international markets. It is supported by the history of the rise of the pound sterling and then the dollar as leading international currencies in the 20th century, both of which were traded on deep and liquid markets.

It cannot be excluded that internationalisation of the RMB may unfold in a very different way. Unlimited access to deep and liquid Chinese capital markets may not necessarily be essential, in fact, for RMB internationalization.

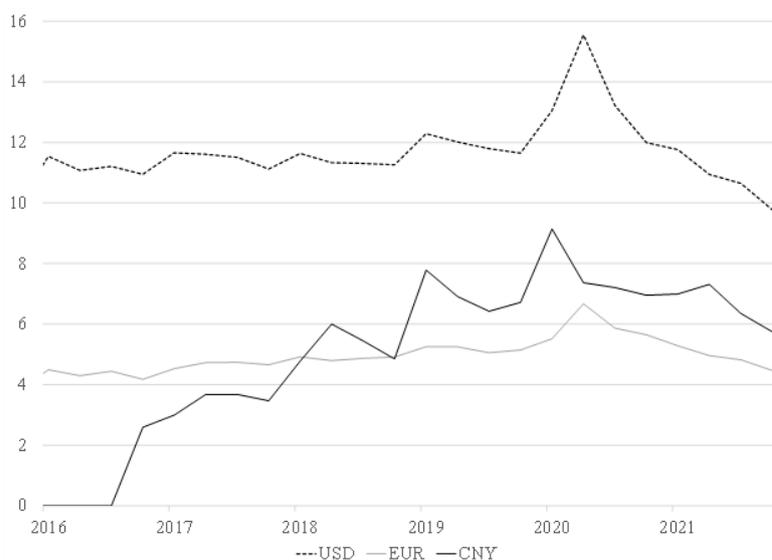
Historically, currencies first acquired a role in trade invoicing and settlement before also assuming reserve currency status. The RMB can similarly acquire a more important international reserve currency role via China's trade links. China has established a global network of clearing and payments, such that it is now possible to undertake cross-border transactions in RMB in a wide variety of different jurisdictions. Using data on reserves in RMB by country, we document a significant correlation between a country's trade with China and its holdings of RMB as reserves, notwithstanding China's limited capital account openness. Invoicing transactions and accepting payment in RMB, the currency that is the natural habitat of Chinese banks and firms, is a way of encouraging Chinese entities to do business with a country's domestic counterparts. Indeed, the ratio of total RMB reserves to trade invoiced in RMB (at the world level) is close to the ratio of total euro reserves to total trade invoiced in euro (see Figure 1). This observation is striking, given China's low degree of capital account openness.

But ability to accumulate RMB-denominated reserves is not the same as willingness to hold them. For the latter, offshore RMB markets and central bank swap lines are key. The PBoC has negotiated bilateral currency swap agreements with at least 39 central banks, totalling some RMB 3.7 trillion (\$550 bn). Although they are not permanent lines available in unlimited amounts, swap lines engender confidence that RMB can be obtained from the Chinese central bank. The offshore market reassures central bank reserve managers and other investors that they can convert RMB into dollars at reasonably stable and predictable prices. Just as the London gold market was a safety valve for dollar holders in the 1960s, the offshore RMB market in Hong Kong is a safety valve for RMB holders today.

Stability and predictability further require the Chinese authorities to regulate the RMB/USD exchange rate. And regulating the exchange rate in turn requires those authorities to hold dollar reserves. This observation suggests that an enhanced role for the RMB as a reserve currency will not automatically eliminate that of the dollar. Rather, China will have to hold dollar reserves in order for other countries to willingly hold RMB reserves. The two reserve currencies will be complements, not substitutes.

Holding dollars may have disadvantages for China, insofar as this creates mutual dependence with the US. But this peculiar relationship between the world's two largest economies is the only way for China to make the RMB a significant reserve currency without embarking on full capital account liberalisation. That said, the question of how many dollars China needs to hold in order to support its economic expansion and encourage its economic partners to hold RMB remains open.

Figure 1. Reserves in months of imports – Global estimates by currency



Sources: IMF, national sources, and authors' calculations

Notes: We measure global imports denominated in USD and EUR by taking country-level observations from the Boz et al (2022) dataset on USD and EUR shares. The share of global imports in RMB is proxied by the share of China's trade settled (i.e. not invoiced) in RMB.

La convertibilité du compte de capital est-elle nécessaire pour que le renminbi acquière le statut de monnaie de réserve ?

RÉSUMÉ

Le sentiment général est que le renminbi (RMB) ne pourra pas avoir un poids significatif dans les portefeuilles de réserves des banques centrales en l'absence de libéralisation complète du compte de capital de la Chine. Nous développons des arguments selon lesquels le RMB peut au contraire acquérir un rôle de monnaie de réserves conséquente, même en l'absence de convertibilité totale du compte de capital. Les liens commerciaux et d'investissement peuvent devenir des facteurs de renforcement de l'utilisation et de l'accumulation du RMB, malgré l'accès limité aux marchés financiers chinois. Mais ceci nécessite un soutien politique. La Chine doit assurer l'accès au RMB, par le biais de prêts ou de lignes de swap de la Banque Populaire de Chine (PBoC). Elle doit aussi garantir une convertibilité du RMB sur les marchés offshore, et assurer une valeur du RMB relativement stable et prévisible. L'internationalisation de la monnaie chinoise sans libéralisation complète du compte de capital exige donc que le RMB soit soutenu par des réserves en dollars. Ainsi, l'internationalisation du RMB ne devrait pas supplanter la domination du dollar.

Mots-clés : système monétaire international, renminbi, monnaies de réserve internationales

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1. Introduction

Why doesn't the currency of the second largest economy in the world play a consequential reserve-currency role? The share of China's renminbi (RMB) in global reserve portfolios, at 3%, pales in comparison with those of the dollar and the euro.ⁱ A common response is that the RMB cannot develop as an international reserve currency without full liberalization of China's capital-account (Frankel 2011; Prasad 2021). This view is based on the assumption that countries will not hold RMB reserves if they cannot easily purchase and sell them on international markets. It is supported by the history of the rise of the pound sterling and then the dollar as leading international currencies in the 20th century, both of which were traded on deep and liquid markets of economies with open capital accounts (Harrod 1952, Eichengreen 2011).ⁱⁱ

Is full capital account liberalization therefore necessary for the RMB to become a consequential reserve currency? We argue that unlimited access to deep and liquid Chinese capital markets may not be essential, in fact. Internationalization of the RMB may unfold in a different way. The renminbi could acquire a more important international role as a form of central bank reserves through RMB invoicing and settlement of China's foreign trade and investment, through offshore financial centers that relax constraints posed by capital account restrictions, and through policy supports such as RMB-denominated loans and currency swaps. The Chinese approach to currency internationalization would not lead to the dominance of the RMB, but rather to a multipolar world of key currencies, in which the dollar, the renminbi and presumably also the euro would play complementary roles.

As we show in this paper, Chinese restrictions on capital account transactions are not absolute. Stock and Bond Connect programs give authorized foreign institutional investors access to a limited but important range of Chinese financial assets. Accumulation of RMB in central bank reserve portfolios could flow from the operation of these arrangements, even in the absence of full capital account liberalization. Countries can also gain access to renminbi-denominated claims by exporting to China and taking payment in the currency. They can accumulate claims by attracting foreign direct investment from Chinese sources and allowing China to finance those investments with RMB. These claims will generally be in the form of RMB deposits to the account of the foreign exporter or borrower in an overseas branch of a Chinese bank or its domestic-bank correspondent. The central bank can then acquire RMB reserves by purchasing them when RMB earnings are exchanged for domestic currency on the

foreign exchange market. Thus, in order for countries to accumulate RMB despite limited access to Chinese capital markets, exports to China must be paid for with RMB. If RMB payments are more prevalent in connection with China's exports than its imports in particular, countries must be able to acquire RMB through means other than trade, e.g., through Chinese foreign direct investment and interest on Dim Sum bonds (renminbi-denominated bonds floated offshore).

But ability to accumulate RMB-denominated reserves is not the same as willingness to hold them. In this connection, offshore RMB markets and central bank swap lines are key. They create expectations that RMB balances can be borrowed, bought and sold. In other words, they create expectations that those RMB balances will be liquid. Swap lines engender confidence that RMB can be obtained from the Chinese central bank, while the offshore market reassures central bank reserve managers and other investors that their RMB can be converted into dollars at reasonably stable and predictable prices. Stability and predictability further require the Chinese authorities to continue regulating the RMB/USD exchange rate.ⁱⁱⁱ

The implication is that China must hold reserves in dollars and other convertible currencies sufficient to finance intervention in the foreign exchange market. It must hold these reserves to assure foreign investors of its willingness and capacity to maintain a reasonably stable and predictable exchange rate. We therefore do not foresee an internationalized RMB as an alternative to the current dollar-centered international monetary system. Rather, we imagine a hierarchy of reserve currencies, with the extent of dollar dominance somewhat diminished and the RMB playing a larger if still subsidiary role.

If China wants to avoid this need to hold dollar reserves while continuing to internationalize its currency, then the only option would be to abandon capital controls, so that the RMB can be developed in a full-fledged alternative to the greenback. In practice, the Chinese authorities have consistently rejected moving to full capital-account convertibility, notwithstanding the gradual, ongoing increase in their economy's financial openness. Chinese leaders fear that an open capital account could lead to imported crises and weaken control of their economy (Mercurio, Buckley, and Fu 2021). The People's Bank of China characterizes its cautious approach as affording a "balance between development and security" (People's Bank of China 2021, p.37).^{iv} By implication, if the RMB develops into a consequential international and reserve currency, it will have to follow a different route than earlier international and reserve currencies.

We develop arguments and evidence that a different route is possible. Specifically, we show that development of the RMB as a reserve currency has kept pace with the expansion of trade invoiced in RMB, notwithstanding China's limited capital account openness. Using data on reserves in RMB by country, we document a significant correlation between a country's trade with China and its holdings of RMB as reserves. Moreover, the ratio of total RMB reserves to trade invoiced in RMB at the global level is close to the ratio of total euro reserves to total trade invoiced in euros. This observation is striking, given China's low degree of capital account openness.^v Our empirical findings support the idea that the share of RMB in total reserves could increase along with invoicing and settlement in the currency, paving the way to a more multipolar global reserve system.

Such a scenario, however, can only occur on the basis of the complex institutional arrangements and international balance of power that we describe: namely, the expansion of bilateral loans in RMB, combined with China's diplomatic influence and willingness to support RMB issuance with US dollars.^{vi} China cannot internationalize the renminbi by itself, in other words; foreign cooperation will be required. The value of economic links with China and the desire to solidify these further explain why countries such as Germany and the United Kingdom have cooperated with the Chinese government on steps to internationalize the RMB (see Pacheco, Pardo, Knoerich, and Li 2019). The same is likely to be true of a range of emerging markets and developing countries. Invoicing transactions and accepting payment in renminbi, the currency that is the natural habitat of Chinese banks and firms, is a way of encouraging Chinese entities to do business with a country's domestic counterparts. The importance of China as an export destination and foreign investment source makes such encouragement of value. And when a country's banks and firms have RMB exposures, whether because they borrow in the currency or make payment in it, the central bank will be compelled to hold RMB reserves so that it can provide those banks and firms with RMB liquidity in the last resort.

China's diplomatic leverage works in the same direction. Holding reserves in a currency is an expression of political good faith. Holding them in RMB is a sign that a foreign central bank is supporting China's efforts to internationalize its currency. Insofar as a country is diplomatically and geopolitically aligned with China, or at least is not overtly opposed to it, access to those RMB reserves will be assured. Eichengreen, Mehl and Chitu (2019) show that central banks disproportionately hold the currencies of their alliance partners.^{vii} Conversely, the recent experience of Russia and Afghanistan suggests central banks will try to avoid the

currencies of their geopolitical rivals and opponents (Sindreu 2022). China is assiduously cultivating diplomatic and geopolitical links, which supports the RMB's acquisition of a global reserve currency role. Alternatively, if one imagines that tensions between China and the United States intensify, and that economic and geopolitical relations bifurcate into competing blocs, then one can instead imagine the RMB acquiring, through these means, a regional (presumably Asia-centered) reserve currency role.

The rest the paper is organized as follows. Section 2 illustrates the current disparity between China's global economic weight and the weakness of the RMB as an international reserve currency. Section 3 discusses China's approach to currency internationalization, entailing limited capital account liberalization and policy support in the form of currency swap lines and institutions for the settlement of international payments. In order to assess the potential consequences of the measures currently taken to internationalize the RMB, section 4 provides empirical evidence on the link between trade in RMB and RMB reserve holding, while Section 5 discusses the importance of offshore markets in RMB for ensuring convertibility into US dollars. Section 6 explains why currency internationalization without full capital account liberalization will continue to require that the RMB be backed by dollar reserves.

1. The RMB as a currency punching below China's global economic weight

The RMB currently accounts for only a small share of the reserves of foreign central banks. More than 20 central banks worldwide have added the currency to their reserve portfolios, but it still accounts for just 3 per cent of global foreign exchange reserves – one-twentieth the share accounted for by the dollar (Figure 1).^{viii}

[Figure 1]

In overall transactions related to not just trade but also finance, the RMB accounted for just 2.4 per cent of global payments in September 2022, far behind not only the dollar but also the euro and sterling.^{ix} The fraction of global imports and exports invoiced in RMB is smaller still (Figure 2). The renminbi is the currency of denomination for less than 1 per cent of international debt securities, equivalent to about USD 100 billion of funding. To put this figure in perspective, note that the dollar accounts for upward of USD 11 trillion of such funding.

Similarly, whereas the dollar accounts for almost 90 per cent of turnover on global foreign exchange markets, the renminbi accounts for just 4 per cent.^x Similarly, bid-ask spreads on purchases and sales of renminbi for dollars are notably wider than spreads on purchases and sales of dollars for sterling, euros and yen. Thus, notwithstanding China ambitions to raise the renminbi's global profile, the currency still faces a long march to match the dollar's importance.

[Figure 2]

The limited role of the RMB as a global currency stands in striking contrast to the preeminent role of China for international trade and lending. China plays a leading role in global trade, accounting for 15% of global exports and 11% of global imports by value. It is the leading source of imports for 40% of countries (70% for the Asian countries sub-group) as of 2022, on par with the euro area (Figure 3). It is the leading export destination for 25% of countries (50% for the Asian subgroup).^{xi}

[Figure 3]

Although trade invoiced in RMB has remained stable as percent of total Chinese trade in recent years, absolute amounts are rising rapidly (Figure 4).^{xii} Much of this increase in RMB invoicing has been concentrated in Asia, with Cambodia, Korean, Taiwan, Thailand and India invoicing 1-3% of their cross-border merchandise transactions in RMB in 2020. This is a multiple of the global average (see Georgiadis et al. 2021). Mongolia is an outlier: about 20% of its trade was invoiced in RMB in 2020.

Similarly, Chinese has emerged as a major international lender.^{xiii} It is now the largest bilateral creditor of the developing world, ahead of the IMF, the World Bank, the United States and the entire Paris Club (Horn, Reinhart, and Trebesch, 2019); see Figure 5. However, most of its lending and investment to date has been in dollars (Liang 2020). Custer and al. (2021) provide data on the currency denomination of China's intergovernmental loans, including through the Belt and Road Initiative (BRI). These show that RMB-denominated loans have constituted about 6% of all loans on average since 2000. This share is higher for Asia and Oceania than other parts of the world (Figure 6, right panel). It has varied over time (Figure 6,

left panel), rising in 2010-11, for example, a period of increased volatility for advanced-country currencies. This suggests that renewed volatility of major advanced-country currencies could encourage Chinese lenders to denominate loans in RMB (and China's borrowers to go along with that decision). Currency volatility and mismatch may not be the only factor driving change, however. Chinese loans are used in part to pay for the services of Chinese infrastructure companies that participate in BRI-funded investment projects.

In parallel, the country has contributed to the creation of new multilateral development banks, in particular the Asian Infrastructure Investment Bank (AIIB), which was initially conceived as a regional financing mechanism for the Belt and Road Initiative (Weiss, 2017). China has the largest voting share at the AIIB (26.6%), well ahead of the second largest AIIB member, India (7.6%). AIIB can offer financing in multiple currencies, including the RMB.

[Figures 4, 5 and 6]

According to the OECD, China's outward direct investment flows amounted to USD 128 billion in 2021. The geographical distribution of China's outward direct investment is blurred however by the presence of stop-over destinations such as Hong Kong and, to a lesser extent, other offshore centers like the Cayman Islands and the British Virgin Islands, destinations that collectively received 68% of China's total outward direct investments in 2020. Estimates of the geographical distribution of final recipients indicate a strong regional bias, with flows being disproportionately destined to Asia (Casanova et al., 2015).

2. The Chinese way to RMB internationalization

China's RMB internationalization strategy combines limited capital account liberalization with the development of financial and payment infrastructures to make the RMB internationally liquid while maintaining managed access to the Chinese domestic market. This section describes this strategy and explains how foreign central banks can accumulate RMB reserves given China's restrictive approach to capital account openness. China's controls on capital inflows and outflows are administered by the State Administration of Foreign Exchange (SAFE). SAFE monitors transactions and, in order to regulate them, transactions, applies

licensing requirements, time requirements, quantitative limits, and direct prohibitions (Mercurio et al. 2021). These administrative measures act on quantities rather than prices. They vary by asset class and identity and category of institution, and can be activated or deactivated according to changes in law and macroprudential policy decisions.

The Chinese authorities have pursued a strategy of gradually opening the capital account. They have deliberately liberalized the entry of foreign investors into the market, first enhancing access for relatively stable long-term investors such as central banks before allowing in flightier investors such as mutual funds (Clayton et al. 2022). The launch of the Shanghai-Hong Kong Stock Connect and the Shenzhen-Hong Kong Stock Connect programs in 2014 and 2016 gave authorized offshore investors simplified access to Chinese equity.^{xiv} Previously, Chinese authorities had almost entirely restricted foreign investments on the Chinese markets to foreign-currency-denominated shares.^{xv} In 2017, launch of the Bond Connect program opened an additional channel through which international investors could access the Chinese market, with enhanced operational efficiency especially regarding account opening and trade settlement (Mercurio et al. 2021, Aglietta and Macaire 2019). These efforts led Chinese stocks and bonds to be added to benchmark indices, such as MSCI, FTSE Russell and Bloomberg.^{xvi}

These measures resulted in an increase in foreign ownership. In January 2022, foreigners held about 11% of the central government Treasury bond market, up from less than 3% in January 2016. As of 2020, an estimated USD 100 billion worth of Chinese bonds were held by private investors, mainly from the euro area, the US and Japan (Clayton et al. 2022).^{xvii} Despite this increased participation of private investors, however, central banks remain the most important investors in RMB bonds, with reserves of nearly USD 300 billion equivalent in that form.^{xviii}

The Chinese authorities also modified mechanisms of exchange rate control and determination. A major foreign exchange regime reform in August 2015 gave market forces a stronger role in calculating the daily central parity rate of the RMB.^{xix} This move to a more market-determined and variable RMB exchange rate was seen as part and parcel with efforts to gradually liberalize the capital account.^{xx}

However, capital account liberalization remains limited. And despite the 2015 reform of the exchange rate regime, the Chinese authorities keep a certain degree of control over the exchange rate.^{xxi} The Connect programs have made it easier for international investors to access China's equity and bond markets, but the process still requires applications and approvals.^{xxii}

An issue for investors using Stock Connect is that the shares are held in a separate account controlled by the Hong Kong Securities Clearing Company. This raises concern about the proprietary rights of these shares under Chinese Law (Huang, 2020). For both bond and stock connect, investors are subject to Chinese securities regulations and tax rules, which can be modified if the Chinese authorities deem it necessary. This reversibility creates political risk for investments in onshore markets.

In recent years, increased interest in Chinese assets has focused on bonds of the central government and state-owned banks, which are secured by government guarantees. In contrast, the financial fragility and lack of transparency of local governments means that foreign investors hold virtually no local government debt (Figure 7). In addition, for the foreseeable future the Chinese government's budget deficits will likely remain small by Western standards. As a result, growth of the stock of safe RMB-denominated assets, of the sort that appeal to central bank reserve managers among others, will remain limited.

[Figure 7]

Central banks will allow banks and firms to incur and settle obligations in RMB only when they are confident that RMB liquidity will be available. Those banks and firms may be able to access the needed RMB funds on the market. When they cannot, their central bank can make that liquidity available by utilizing its RMB reserves. It can also make RMB liquidity available after swapping the domestic currency for RMB with the PBoC.

The PBoC has bilateral currency exchange agreements with 39 central banks, totaling RMB 3.7 trillion (about \$550 trillion). In contrast to Federal Reserve swap lines, however, these are not permanent lines unlimited in amount (Perks et al. 2021). Still, compared to other major central banks, the volume of China's currency swap lines is substantial (Figure 8). In each case, the maximum amount that can be borrowed is specified by an agreement with the foreign central bank.^{xxiii} To date, there is only limited evidence of actual use of RMB swap lines (McDowell, 2019, Cheung 2021, Perks et al. 2021).^{xxiv}

[Figure 8]

As stated in the swap agreements, RMB swap lines are designed to finance the provision of trade credit and working capital (McDowell 2019, Bahaj and Reis 2020).^{xxv} Foreign central banks use the funds to provide RMB to local banks, which in turn extend RMB-denominated trade credit to their clients. This is in contrast to Federal Reserve swap lines, which are designed to address the dollar funding needs of foreign banks, many of which arise in connection with the financial investment and trading activities of those institutions (Perks et al. 2021).^{xxvi} Bahaj and Reis (2020) confirm that RMB swap lines encourage use of the RMB in cross-border payments.^{xxvii} Georgiadis et al. (2021) similarly show that PBoC swap lines are associated with greater RMB invoicing.

29 of 39 Chinese swap agreements are with emerging market central banks. This choice of partners further distinguishes the PBoC from the Federal Reserve, which initially extended dollar swaps to only four emerging markets. Since emerging markets can be relatively small, this means that maximum amounts that can be drawn from PBoC swap lines can be high as a percentage of recipient country GDP (Figure 9).

Another channel for RMB liquidity is the Chiang Mai Initiative Multilateralization (CMIM). CMIM is the regional currency swap agreement between Association of South East Asian Nation (ASEAN) countries and China, Japan and South Korea (ASEAN+3). It was established in 2010 with a total of USD 120 billion in lines, and expanded in 2014 to USD 240 billion, of which China contributes about USD 77 billion (USD 68 billion excluding its swap line with Hong Kong).^{xxviii} Initially, participating central banks, including the PBoC, agreed to provide dollars to their CMIM partners in exchange for local currencies. In March 2021, it was then agreed to permit local currency swaps, on a voluntary and demand-driven basis. Hence the PBoC can use this institutional framework as a vehicle for providing RMB to other central banks in exchange for their currencies. However, just as there is limited evidence of actual activation of the PBoC's bilateral swap lines, there has been no activation to date of CMIM credit lines.

[Figure 9]

Most recently, the PBoC has cooperated with five foreign central banks in establishing a USD 13.5 billion RMB liquidity pool at the Bank for International Settlements.^{xxix}

Participating central banks will each contribute USD 2.2 billion in renminbi or dollars (where the PBoC will presumably stand ready to convert dollars in the pool into RMB). They will be able to withdraw RMB in excess of their own contributions through a “collateralized liquidity window,” meaning that they will have to post their local currency or dollars (together with the relevant forward transaction) in the manner of a bilateral currency swap (Choi 2022).

A significant increase in RMB payments requires an infrastructure through which such payments can be efficiently cleared. To this end, starting with Hong Kong in 2003 China has designated one or more official Chinese clearing banks to undertake cross-border transactions in RMB in each offshore financial center. There are now offshore clearing banks in 26 foreign financial centers (Cheung 2021). These provide real-time settlement services for cross-border remittances and other offshore settlements.^{xxx} By the end of 2020, 907 participating banks and other institutions had opened clearing accounts with offshore RMB clearing banks. Total offshore RMB clearing in 2020 amounted to RMB 369 trillion. Banks located in the Asia-Pacific region, mainly Hong Kong, accounted for 96% of the clearing amount of all clearing banks in 2020 (PBoC, 2021). In Hong Kong, first-mover advantage and geographic proximity to China have fostered the development of an ecosystem for offshore RMB business, which explains the concentration of offshore clearing there (Cheung, 2021). The concentration of offshore transactions in Asia does not, however, call into question the global reach of clearing services.

The alternative to clearing payments offshore is, of course, clearing them onshore in China. To this end, in October 2015 China launched its Cross-border Interbank Payment System (CIPS) (Cheung 2021, Eichengreen 2022). CIPS is a messaging and clearing system for international transactions.^{xxxi} It allows international banks to clear cross-border RMB transactions with their onshore Chinese counterparts directly, rather than through clearing banks located in offshore centers that in turn have correspondent relationships with onshore banks. It is similar to the United States’ Clearing House Interbank Payments System (CHIPS), which clears and settles domestic and cross-border U.S. dollar transactions and uses SWIFT for cross-border messaging. The system handled RMB 45.27 trillion in payments in 2020 (PBoC, 2021) and RMB 79.60 trillion in 2021 (PBoC, 2021c). This volume is still small compared to offshore RMB clearing operations (12 percent of offshore clearing operations by value in 2020), but it is increasing rapidly (Cheung, 2021).

As of March 2022, CIPS had 1,304 participating banks across 104 countries (CIPS, 2022).^{xxxiii} Participating banks are divided into direct and indirect participants. Direct participants, which must be incorporated in China, clear RMB payments among themselves. Most of these direct participants, of which there were 76 as of March 2022, are Chinese banks, although HSBC, Standard Chartered, the Bank of East Asia, Deutsche Bank and BNP Paribas have issued press releases announcing their direct participation. Indirect participants, who number 1,228 as of March 2022 according to CPIS's website, settle RMB payments by transacting with one of the direct participants.

For the moment, this system is still mostly focused on Asian banks, and amounts remain relatively small. Whereas CHIPS is used by around 11,000 financial firms worldwide, CIPS is used by just over 1,300. CHIPS processes 40 times as many transactions in value: in March 2022, daily volume on CIPS was RMB 385 billion (USD 46 billion), compared to USD 1.8 trillion on CHIPS (Yeung and Goh 2022). In addition, CIPS uses SWIFT to send messaging instructions regarding most cross-border transactions, foreign banks not yet having installed reliable translation software to decode Chinese-language characters. Yeung and Goh (2022) estimate that 80 percent of payments through CIPS (both payments between pairs of Chinese banks and between those banks and their non-Chinese counterparties) use SWIFT messaging. On average, CIPS recorded 14,470 messages per day in February 2022, compared to 42 million a day for SWIFT. All this could conceivably change, however. Some observers envisage CIPS transactions and messaging increasing rapidly. They suggest that CIPS has the potential to operate independently of SWIFT and to provide direct communication lines linking financial organizations settling cross-border transactions in RMB.

In sum, CIPS and offshore clearing banks provide channels through which firms exporting to and importing from China can accept and make payment in RMB, and through which China's outward FDI and foreign purchases of Chinese financial assets (as permitted) can be financed. Foreign reserve accumulation, transactions on offshore markets, bilateral swap lines with the PBoC, the CMIM and the BIS reserve pool are mechanisms through which their central banks can acquire and hold RMB liquidity and make it available, as needed, to domestic entities engaging in these transactions.

Finally, it is important to allay a confusion, namely the belief that other countries can accumulate RMB reserves only if China runs trade deficits, either bilaterally or overall. In principle, if China pays for imports with RMB, but earns dollars when exporting, then countries

exporting to China can accumulate RMB either if exports exceed imports or the reverse.^{xxxiii} In addition, foreigners can accumulate RMB via other components of the current account (by accepting RMB in payment of interest on Dim Sum bonds, for example). They can acquire RMB claims via the capital account – by accepting RMB in payment for direct foreign investments and by purchasing RMB-denominated assets to the extent permitted by China’s capital-account regulations. Strictly speaking, then, Chinese trade deficits are not needed in order for foreign investors, official and private, to acquire RMB.

4. The importance of trade as a channel of RMB internationalization

Using data on the composition of official reserves from the IMF (International Reserves and Foreign Currency Liquidity) together with national sources, we can analyze the role of trade in RMB reserve accumulation.^{xxxiv} We construct a monthly database of countries that publish the value of their RMB reserves (along with reserves in USD, EUR, GBP, and JPY). The dataset runs from January 2015 to January 2022. To account for trade links with China, we retrieve monthly trade data from the IMF’s Direction of Trade Statistics (DOTS).

In Table 1, we estimate reduced-form equations for the determinants of the share of RMB in official reserves at the country level as in Ito and McCauley (2019) and Arsanalp, Eichengreen and Simpson-Bell (2022a). Like these studies, we focus on the role of trade. Our exercise differs, however, by focusing on the RMB and using monthly data.^{xxxv} The result is an unbalanced panel of 22 countries since 2016.^{xxxvi}

A potential concern is reverse causality between RMB reserve holdings and trade with China. One way of addressing this concern is to include time fixed effects that control for common trends. We also include country fixed effects to deal with time-invariant characteristics at the country level that might influence both the level of RMB reserve holdings and trade with China. To account for potential unobserved regional trends, such as China’s growing footprint in Asia, we include continent fixed effects.

[Table 1]

Another source of bias could stem from other variables that jointly influence RMB reserve holdings and trade with China, such as bilateral agreements supporting RMB accumulation or usage for current account-related transactions. As additional controls we therefore include dummy variables that equal 1 if a country is a member of the Asian Infrastructure Bank; has at least one RMB clearing bank; has signed a Memorandum of Understanding (MoU) with China in the context of the Belt and Road Initiative, or has a currency swap line with the PBoC. We also indicate whether the country belongs to the euro area to correct for the fact that euro area countries do not hold EUR as reserves and must therefore consider other units including, potentially, the RMB.

In column 1, we report estimates of the regression where the explanatory variables are restricted to the control dummies. Membership of the Asian Infrastructure Bank and establishment of swap lines with the PBoC are associated with a greater share of the RMB in total reserves.^{xxxvii} In addition, higher shares of China as a source of imports (column 2) and destination of exports (column 4) are associated with a greater share of RMB in total reserves. The share of RMB in total reserves is also significantly higher for countries where China is the largest source of imports amongst all partners (column 3).^{xxxviii}

The coefficient on the share of China in total external trade (column 6) is 0.08. This value is statistically significant but small compared to results for the impact of trade composition on the share of the dollar and euro in total reserves (see e.g. Ito and McCauley 2019; Arslanalp, Eichengreen and Simpson-Bell 2022a). Such studies typically estimate coefficients for other key currencies in the range of 0.5-1.1.

This contrast suggests that trade lends less impetus to currency internationalization for China than for the U.S. and euro area. One can imagine two explanations. First, RMB accumulation requires a prior decision on the part of a central bank to diversify its reserves and add the currency to the reserve portfolio, only after which does one observe a discontinuous increase in the share of RMB reserves. (One can think of this as reflecting a fixed cost of adding a new currency to the reserve portfolio.) For example, in April 2022 the Bank of Israel announced that it was adding the RMB to a reserve portfolio previously comprised exclusively of other currencies (despite the fact that it had long since begun trading with China).^{xxxix} Similarly, Brazil and Chile doubled their share of RMB in reserve holdings in 2019, with no significant increase in trade with China. When a number of central banks have not previously taken such decisions to add a new currency to an existing reserve portfolio, the overall (cross-

country) correlation between rising trade shares and rising reserve shares will be correspondingly smaller.

Second, a relatively small fraction of China's external trade is denominated in RMB (refer back to Figure 7 above), whereas the U.S. and euro area denominate a considerable fraction of their trade in their own currencies.^{x1}

Another way of assessing the elasticity of currency accumulation with respect to trade is by calculating the stock of currency reserves in months of imports denominated in that currency. For world imports denominated in dollars and euros, we rely on the Boz et al. (2022) dataset on the share of trade invoiced in USD and EUR for more than 100 countries. We calculate the trade-weighted overall share of dollars and euros using IMF DOTS at the country level and use it to estimate to world total amount of imports in dollars and RMB.^{xii} We then distinguish (1) intra-euro area imports and (2) imports from the U.S. denominated in dollars.^{xiii} (Recall that members of the euro area do not hold euro reserves and that the U.S. does not hold dollar reserves.) For total imports in RMB, we take total Chinese exports multiplied by the share of total external trade of China settled in RMB.^{xiii} Finally, reserve holdings by currency are retrieved from the IMF COFER database.

Figure 10 shows that holdings of RMB reserves worldwide are still small relative to imports denominated in RMB, compared with holdings of dollars relative to trade denominated in dollar. The ratio for the renminbi is actually quite close to the corresponding ratio for the euro. This is again striking considering the low degree of China's capital account openness.

[Figure 10]

Finally, we consider the subsample of countries for which we have data on both the share of reserves held in RMB and the share of trade invoiced in RMB.^{xiv} This leaves us with a small sample of 9 countries with annual data. For these countries, we compute the value of RMB reserves in months of imports invoiced in RMB.^{xiv} Figure 11 shows that countries that have more RMB-denominated imports hold more RMB reserves measured in terms of month of imports.

All in all, the evidence points to a positive relationship between RMB reserves and trade with China, especially when trade is invoiced in RMB. Despite the limited openness of China's

capital account, the accumulation of RMB by foreign monetary authorities has kept pace with trade invoiced in RMB. In line with the recent literature (Gopinath 2015, Boz et al. 2022), our findings thus highlight the importance of trade invoicing for reserve composition. They suggest that, despite China's still limited capital account openness, the share of RMB in reserves can increase if Chinese trade and RMB invoicing continue to increase.

[Figure 11]

5. The importance of offshore markets

The majority of cross-border financial transactions with China continue to be denominated in dollars. This means that central banks holding RMB reserves may on occasion wish to convert some of their RMB into dollars to meet the liquidity needs of banks and firms importing from China and in order to intervene in the foreign exchange market. Thus, internationalization of the RMB in the absence of capital account convertibility presupposes mechanisms through which central banks can convert their RMB into dollars, on demand, at a stable and predictable rate.

The first sections of our paper described infrastructures built by China to encourage use of the RMB: clearing banks, CIPS and swap lines. In this section, we look at the other side of the coin, that is, mechanisms China has put in place to provide US dollars in exchange for RMB. The two measures are complementary. In the absence of a fully open capital account, China must concern itself not just with providing RMB to the rest of the world; in addition, it must ensure that foreign countries are able to sell RMB for dollars when they wish.

One such mechanism is the offshore RMB market. This is a market for exchanging RMB in financial centers outside Mainland China. The Chinese authorities initiated the development of the offshore market in mid-2010 by authorizing RMB trading in Hong Kong. Subsequently, offshore markets were opened in 24 other cities. Hong Kong remains the largest offshore RMB center, accounting for close to three-quarters of offshore payments as of June 2022. The RMB is designated as CNH in these markets, unlike in Mainland China, where it is known as CNY. Central banks that hold reserves in RMB can expect that they will be able to convert them into dollars in the offshore markets (provided that not all of them decide to convert RMB at the same time, given the limited amounts of liquidity available offshore). As of July

2021, about RMB 1.25 trillion (about USD 200 billion) was deposited in offshore accounts. This amounts to about 0.5% of deposits held in Mainland China. In contrast, offshore dollar deposits (Eurodollars) were estimated as USD 14 trillion in 2016, or close to 130% of national deposits at that time.^{xlvi} The comparison suggests that offshore markets in RMB still have a long way to go.

CNY and CNH do not necessarily trade at the same price. Capital controls between the two markets imply fixed costs and delays in arbitrage trading (Eraslan, 2019). The onshore RMB market (the CNY market) is impacted by central bank foreign exchange interventions and subject to a fluctuation band. By contrast, the offshore market is not restricted to a daily trading band. It also has a more diversified range of RMB-linked financial derivatives (Liu and al., 2022). Investors in the CNH market are more affected by changing global risk factors and contagion, thus causing information gaps between the two markets (Eraslan, 2019, Liu et al. 2022).

At the same time, the shallowness of offshore markets gives the PBoC the ability to intervene on those markets and control the CNH exchange rate. In 2016, for example, the PBoC reportedly intervened in the Hong Kong offshore market to support the RMB by buying CNH against USD, thereby reducing the pool of offshore liquidity in its currency.^{xlvii} Reduced liquidity increased the price for banks looking to borrow RMB to short the currency. Further growth of offshore markets would provide another source of liquidity for central banks and others holding RMB balances, but it would at the same time make it more expensive for China to regulate movements in the CNH market.

The question therefore is what maximum size of offshore market the Chinese authorities are prepared to allow, and how large an offshore market will be needed to support the conversion of RMB into convertible currencies, as use of RMB reserves continues to grow. Under almost any conceivable scenario, however, this market will remain small compared to offshore markets for dollars, in Europe and elsewhere, for the foreseeable future.^{xlviii}

6. Dollar Backing

Dollar backing is important for the RMB to play a role as an international reserve currency. China is the largest holder of foreign exchange reserves worldwide, with a stock of USD 3.4 trillion as of January 2022, or close to 10% of China's M2 money supply.^{xlix} This

stock of foreign reserves lends credibility to the commitment of Chinese authorities to intervene on foreign exchange markets to support the RMB. It allows public and private entities to exchange USD against RMB on the offshore market, as described in the previous section. Although net export receipts and investment flows have supported the accumulation of USD deposits in China, their convertibility into RMB is constrained by capital account controls. Holders of U.S. dollars in China must obtain permission to transfer them abroad and therefore cannot freely exchange them for RMB with foreign investors. For this reason, depth and liquidity in the onshore FX market remain low, whereas the offshore market guarantees investors and central banks alike convertibility of their RMB. Without access to the offshore market and without the certainty that the PBoC can supply dollars through this market, holding RMB would be perceived as too risky by foreign private institutions and monetary authorities.

We see a parallel between the role of the US dollar for China today and the role of gold for the United States under the Bretton Woods System. Gold was the most trusted reserve asset at that time, much as dollars are today. Convertibility into gold was important for confidence in the dollar.ⁱ Yet, contrary to the previous international monetary regimes, only central banks had the right to convert dollars into gold at the Federal Reserve.ⁱⁱ Thus, gold was perceived as necessary to maintain confidence in the dollar and make it an international currency, even though private investors could not exchange their dollars into gold in the United States.

The private gold market in London allowed central banks and other financial market participants to convert their dollars into gold (Eichengreen 2010, Bordo, Monnet and Naef 2019). Central banks preferred to buy gold on the London market to avoid political tensions that might arise if they demanded conversion by the Federal Reserve. This market had reopened in 1954 and operated efficiently once European exchange controls were lifted in the late 1950s. From this point, there was, in addition to the official price of gold at the Fed window, a free market dollar price of gold in London. The London gold market acted as a measure of the dollar gold peg and as a barometer for the confidence in the Bretton Woods System (Harvey 2013).ⁱⁱⁱ The Fed therefore monitored and supported the London gold market price to ensure it did not deviate too much from the Fed window price (Naef 2022).

Historical comparisons are always imperfect: there is no special window today for foreign central banks to obtain dollars at the PBoC, and capital controls are more prevalent in China than they were in the U.S. under Bretton Woods. Nevertheless, the situation of the RMB today is not unlike that of the dollar in the 1950s and 1960s. Both the London gold market in

the 1960s and the offshore RMB market today are products of a similar problem, namely the imperfect convertibility of an international currency (the dollar then, the RMB now) into the ultimate reserve currency (gold then, the dollar now). Convertibility of RMB into dollars today is limited by capital account restrictions, while convertibility of dollars into gold was restricted by U.S. monetary law under Bretton Woods. Just as the London gold market was a safety valve for dollar holders, the Hong Kong offshore RMB market is a safety valve for RMB holders. It is a barometer of confidence in the RMB, and the Chinese authorities have no choice but to monitor it and hold dollar reserves enabling them to intervene there, if they want foreign central banks to accept and accumulate RMB without fully opening the Chinese capital account. To support internationalization of their currency, the Chinese authorities must ensure a degree of stability of the RMB against the dollar (today's safe asset) and convertibility into dollars as needed on the offshore market.

It is possible to imagine other central banks cooperating with China to intervene in the offshore RMB market.^{liii} The CMIM and BIS RMB reserve pool described in Section 2 above can be interpreted in this light. Such cooperation would echo that of the Gold Pool (1961-1968), when U.S. allies intervened on the London gold market to defend the gold-dollar exchange rate.^{liv} But that experience should serve as a cautionary tale for China. Cooperation in the Gold Pool did not end well, because U.S. domestic policies were deemed broadly incompatible with the existing gold-dollar parity (Bordo et al. 2019).

7. Conclusion

As in other aspects of its political and economic model, China is following its own path in internationalizing its currency. That path does not involve abrupt capital account liberalization, which could increase the volatility of the Chinese capital account and require adoption of a more flexible exchange rate. The government is aware of the fate befalling Japan after it yielded to U.S. pressure to liberalize its financial system in the 1980s, and of the problems encountered by South Korea when it liberalized as a condition of joining the OECD in the 1990s.

We argue that the RMB can nonetheless undergo an internationalization process with Chinese characteristics. Trade can be a channel for RMB reserve accumulation.^{lv} China is the world's largest exporter and importer. Its role as a trading partner is particularly strong with emerging countries, especially in Asia. Our estimates document a significant relationship

between the share of foreign reserves in RMB and the share of trade with China. The evidence we present here suggests that RMB holdings should continue to increase as Chinese trade invoiced in RMB continues to grow.

Foreign investment can also be a channel for RMB reserve accumulation. China is the world's largest provider of bilateral loans and direct investment to the developing world. RMB reserves will grow further if BRI loans and other Chinese foreign investments are increasingly denominated in RMB.

With the BRI and its foreign investment generally, China is increasing its economic and political influence in emerging markets. The resulting diplomatic and geopolitical links will continue to encourage foreign central banks to accumulate and hold RMB reserves (assuming of course that those diplomatic and geopolitical links continue to be regarded positively).

The growing role of RMB in reserves also reflects the development of infrastructures facilitating the international use of the currency: offshore clearing banks, the Cross-Border Interbank Payments System (CIPS), bilateral currency swaps, the CMIM and the BIS RMB pool. Swaps, the CMIM and the BIS pool offer access to currency to central banks whose corporates settle payments with Chinese counterparts in RMB. Offshore clearing banks and CPIS are channels for cross-border payments. The latter, in particular, could become more efficient and reliable in the future.

We explain also how China needs dollar reserves to support internationalization of the RMB. These ensure that the Chinese authorities can maintain a degree of exchange rate stability. They can be used to provide dollars in exchange for RMB, which is important for RMB holders, given that the vast majority of cross-border transactions continue to be settled in dollars. The Chinese authorities' maintenance of dollar reserves at least partly remedies the incomplete convertibility that prevents foreigners from more extensively using the currency while allowing the Chinese authorities to retain control of the exchange rate. This will remain the case even if China increases the share of its loans to foreign countries denominated in RMB.

Holding U.S. dollars may have disadvantages for China, insofar as it creates mutual dependence with the United States, but this peculiar relationship between the world's two largest economies is the only way for China to make the RMB a significant reserve currency without embarking on full capital account liberalization. The question of how many dollars China needs to hold in order to support its economic expansion and encourage its economic partner to hold RMB remains open.

This paper has described a Chinese route to currency internationalization without historical precedent. If it is followed, the result will be multipolar international monetary world with complex financial and political relationships between multiple reserve currencies.

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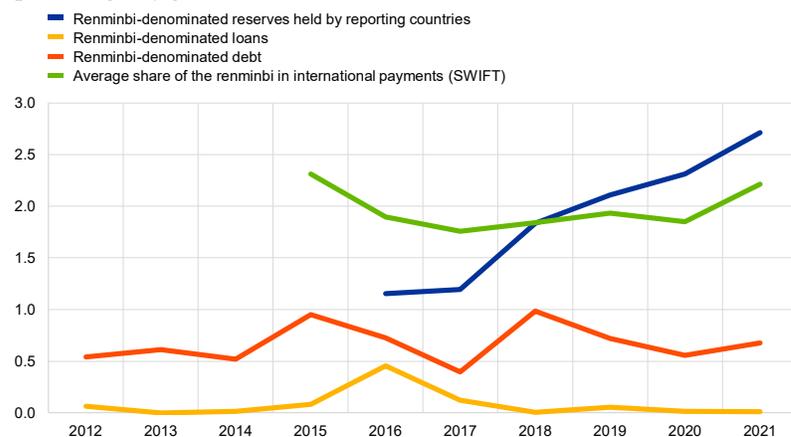
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Figure 1. Share of the renminbi in selected measures of international currency use – Non-trade use of the renminbi

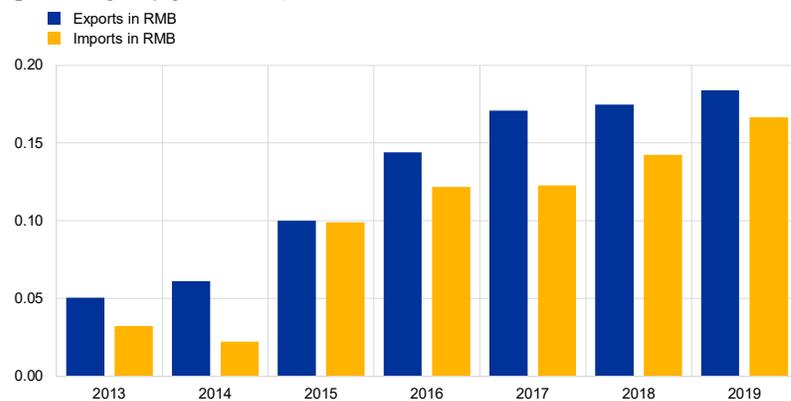
(percentages of global total)



Sources: Dealogic, Haver Analytics, IMF, People’s Bank of China, SWIFT.

Figure 2. Share of the renminbi in selected measures of international currency use – Trade use of the renminbi

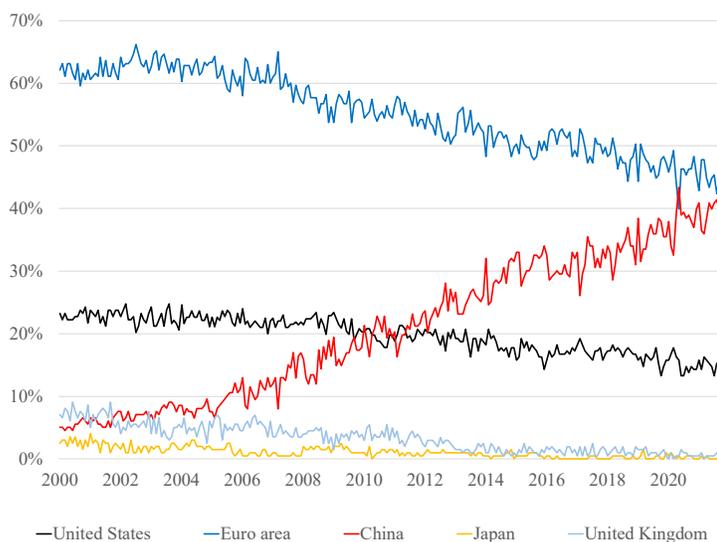
(percentages of global total)



Source: Georgiadis et al. (2021).

Note: Exports and imports in renminbi are constructed as the weighted average of global trade invoiced in renminbi.

Figure 3: Main source of imports – Breakdown by key source countries
(percentages of all countries)



Sources: IMF DOTS and authors' calculations.

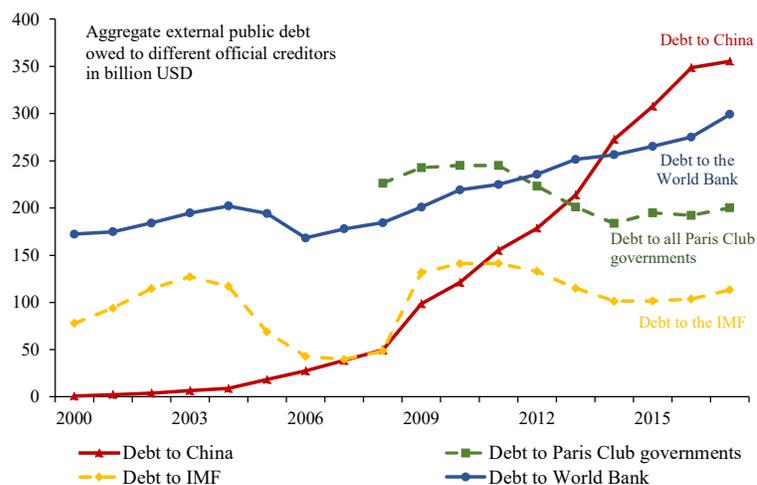
Figure 4. Invoicing in RMB of China's external trade in goods
(left-hand scale: in USD million; right-hand scale: as a percentage of total trade)



Sources: People's Bank of China, General Administration of Customs and authors' calculations.

Notes: The figure shows the extent of China's external trade in goods invoiced in RMB in volume (on the left-hand scale) and scaled by total trade (on the right-hand scale).

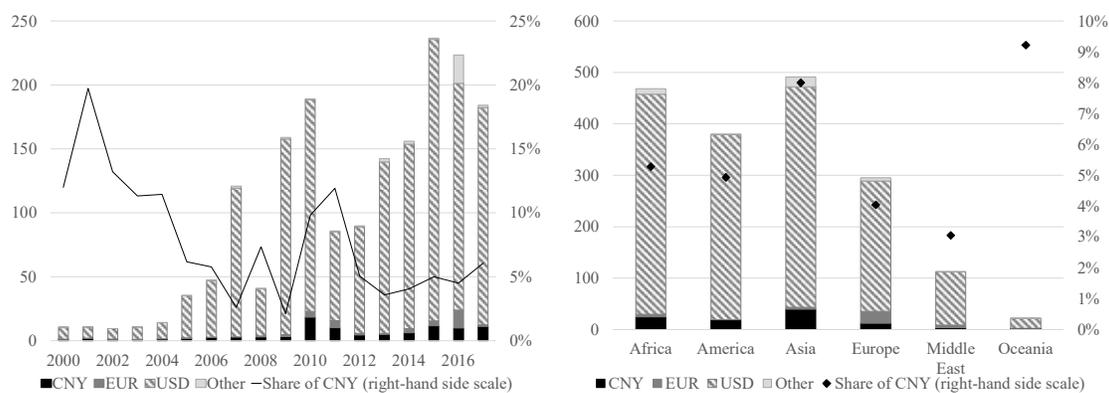
Figure 5. China as the largest official creditor to the developing world
(USD billion)



Source: Horn, Reinhart and Trebesch (2021).

Note: This figure shows aggregate public debt to different official creditors for all developing and emerging market countries contained in the World Bank International Debt Statistics (excluding China). Debt to Chinese official creditors is based on the authors' own estimates. Debt to all 22 Paris Club governments is taken from the Paris Club website (available since 2008). Debt to the IMF and the World Bank Group (IBRD plus IDA) is from the World Bank's International Debt Statistics.

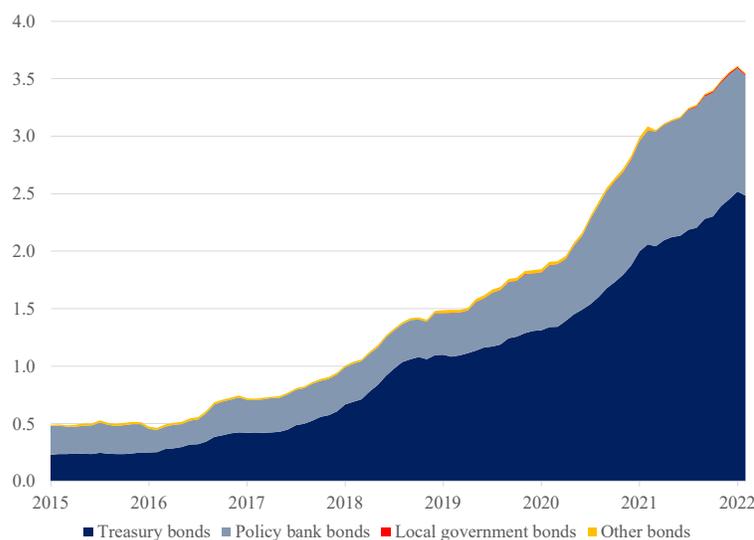
Figure 6. Chinese official bilateral lending – breakdowns by currency and region
(left-hand scale: in USD billion; right-hand scale: as a percentage of total lending)



Sources: AidData, Global Chinese Development Finance Dataset, authors' calculations

Notes: The figure shows the evolution of China's official bilateral lending broken down by currency between 2000 and 2017 (left panel) and cumulated totals broken by currency and region as of 2017 (right panel).

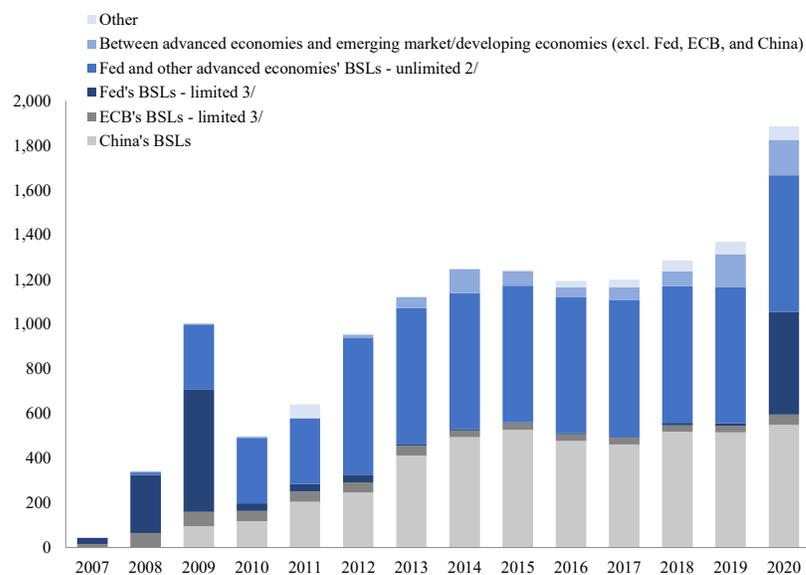
Figure 7. Foreign holdings of onshore Chinese bonds – breakdown by issuer
(in RMB trillion)



Sources: China Central Depository and Clearing and authors' calculations.

Notes: The figure shows non-Chinese resident holdings of Chinese domestic bonds broken down by type of issuer.

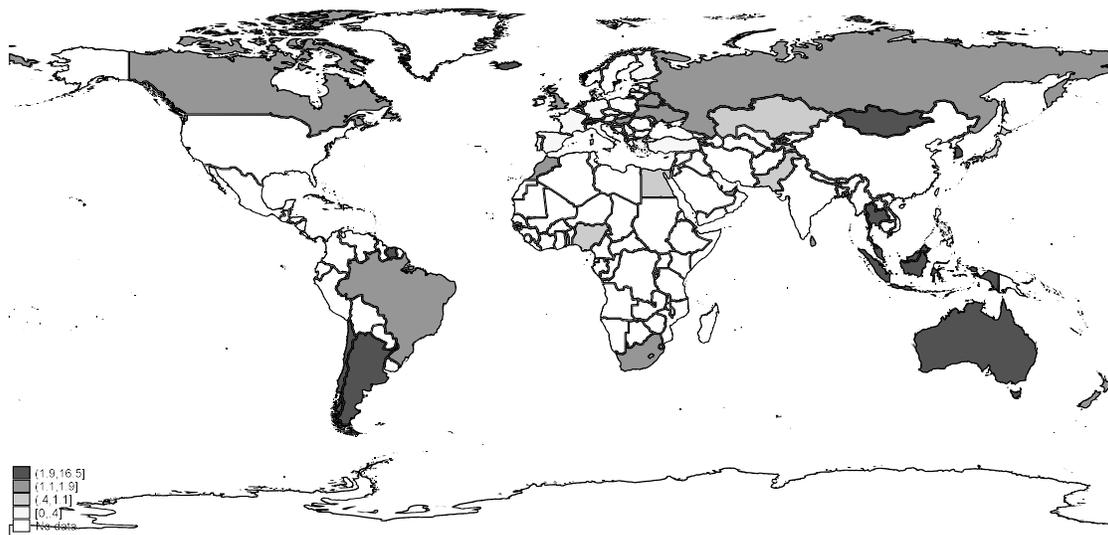
Figure 8. Volumes of bilateral currency swap lines
(in USD billion)



Sources: Perks et al. 2021.

Notes: ^{1/} Two-way arrangements are counted only once. ^{2/} Permanent swap lines among major advanced economy central banks (Fed, ECB, Bank of England, Bank of Japan, Swiss National Bank, Bank of Canada). The estimated amount is based on known past usage or, if undrawn, on average past maximum drawings of the remaining central bank members in the network, following the methodology in Denbee et al. (2016, Bank of England Financial Stability Paper). ^{3/} BSLs with an explicit limit.

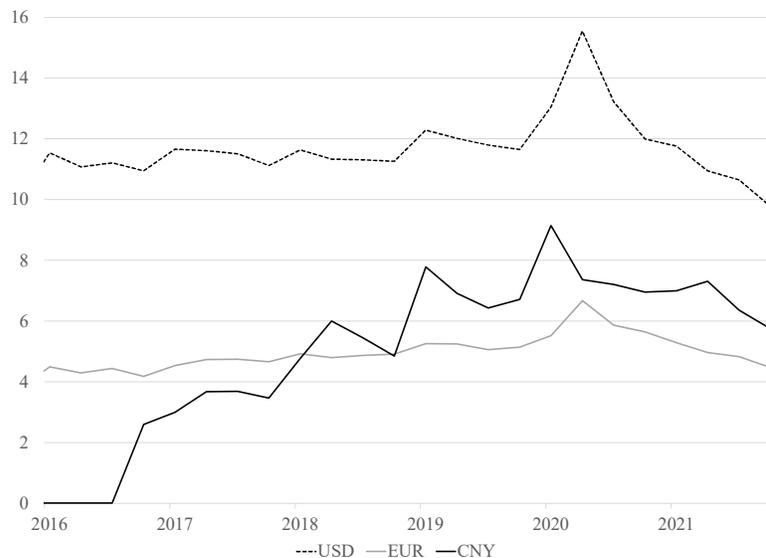
Figure 9. Currency swap agreements with the People’s Bank of China
(as a percentage of recipient country GDP)



Sources: International Monetary Fund, national sources and authors calculations.

Notes: This map shows the countries with which the People’s Bank of China has established a currency swap line. Differences in the size of the swap lines (scaled by GDP) are mirrored in the spectrum of colors on the map.

Figure 10. Reserves to imports ratio – Global estimates by currency
(as a percentage)

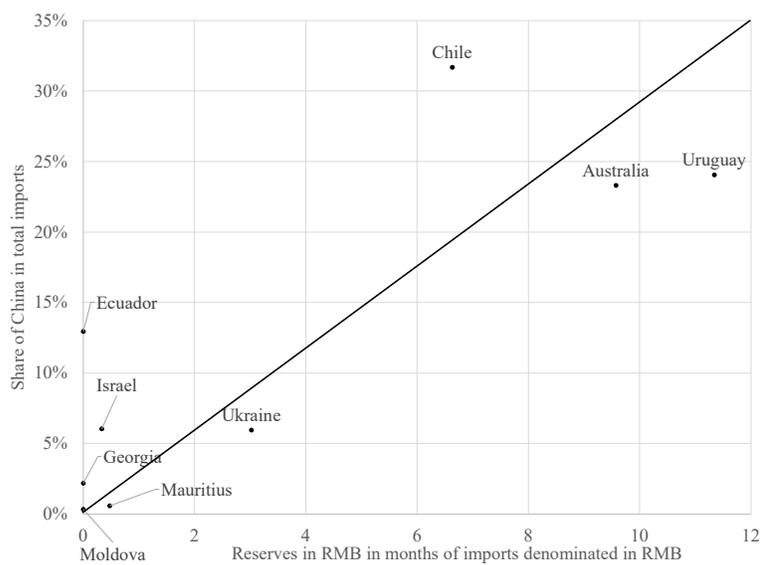


Sources: IMF, national sources, and authors’ calculations

Notes: We measure global imports denominated in USD and EUR by taking country-level observations from the Boz et al (2022) dataset on USD and EUR shares. Country-level observations are then aggregated to global totals using trade weights (computed from the IMF’s Direction of Trade Statistics). The global totals are net of intra-euro area trade (for the euro; to correct for the fact that euro area countries do not hold EUR as a reserve unit) and US trade (for the US; to correct for the fact that the US does not hold USD as a reserve unit). The share of global imports in RMB is proxied by the share of China’s trade settled (i.e. not invoiced) in RMB.

Figure 11. Reserve to imports coverage – Country-level evidence

(y-axis: as a percentage; x-axis: months)



Sources: Boz et al. (2022), IMF DOTS

Notes: This figure plots the share of bilateral imports from China against the share of reserve to imports in RMB ratio for selected economies for which data on both variables are available. The 45-degree line is shown as a black line

Table 1. Estimates of the determinants of the role of the RMB as an official reserve currency

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.094*** (0.017)	-0.102*** (0.018)	-0.099*** (0.018)	-0.105*** (0.018)	-0.088*** (0.018)	-0.111*** (0.018)
Euro area member	-0.018*** (0.004)	-0.004 (0.005)	-0.011*** (0.004)	-0.009** (0.004)	-0.012*** (0.004)	-0.004 (0.005)
AIIB member	0.120*** (0.004)	0.110*** (0.005)	0.117*** (0.004)	0.118*** (0.004)	0.120*** (0.004)	0.011*** (0.004)
RMB clearing bank	-0.035*** (0.005)	-0.032*** (0.005)	-0.034*** (0.005)	-0.035*** (0.005)	-0.036*** (0.005)	-0.033*** (0.005)
MoU on Belt and Road	-0.001 (0.002)	0.001 (0.002)	0.002 (0.002)	0.001 (0.002)	0 (0.002)	0 (0.002)
PBoC swap line	0.037*** (0.006)	0.034*** (0.006)	0.036*** (0.006)	0.036*** (0.006)	0.038*** (0.006)	0.034*** (0.006)
Share of China in imports		0.075*** (0.024)				
China first import source			0.009*** (0.002)			
Share of China in exports				0.040** (0.017)		
China first export destination					-0.003 (0.004)	
Share of China in total trade						0.083*** (0.026)
Country fixed effects	YES	YES	YES	YES	YES	YES
Continent fixed effects	YES	YES	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES	YES	YES
Adjusted R ²	0.76	0.76	0.77	0.76	0.77	0.76
Number of countries	22	22	22	22	22	22
Number of observations	991	958	958	958	958	958

Source: authors' estimates.

Notes: The table reports panel estimates obtained by OLS where the dependent variable is the share of the RMB on official foreign exchange reserves. The estimates control for continent-, country- and time fixed effects. *** indicates that the estimated coefficients are statistically significant at the 1% level of significance, ** at the 5% level of significance, and * at the 10% level of significance.

Endnotes

- ⁱ With shares of about 60% and 20%, respectively.
- ⁱⁱ This observation is mirrored in theoretical models which emphasize that the safe-asset role of the US dollar and the superior insurance properties of US bonds arise from country size (Hassan 2013), better fiscal fundamentals and liquidity of debt markets (He, Krishnamurthy, and Milbradt 2016), the monopoly power of the US as a safe asset provider (Farhi and Maggiori 2018) or complementarities in international trade and finance pinning down the role of a currency in global official reserves (Gopinath and Stein 2022).
- ⁱⁱⁱ In 2022, the RMB lost 12% against the US dollar weakening to its lowest value against the greenback since the global financial crisis of 2007-09 on concerns of market participants about the economic effects of China's zero-covid policy and the recent appointments to China's Communist Party's Politburo and Standing Committee that might herald more inward-looking and less market-friendly economic policies.
- ^{iv} The People's Bank of China emphasizes "market-driven principles" but also that it will "further improve the macroprudential management framework for cross-border capital flows, strengthen the work on monitoring, analysis and early-warning of the cross-border capital flows, and ensure that no systemic risk would be triggered by regulatory misconduct, so as to better serve the establishment of a new development paradigm."
- ^v Here we follow standard practice in the literature by using RMB invoicing, for which we have data, as a proxy for RMB settlement or payments, while taking pains to emphasize that while correlated they are not exactly the same thing.
- ^{vi} Consistently with this view, China launched on 25 June 2022 a new Renminbi Liquidity Arrangement allowing five other central banks (Bank Indonesia, Bank Negara Malaysia, the Hong Kong Monetary Authority, the Monetary Authority of Singapore and the Central Bank of Chile) to obtain pooled reserves at the Bank for International Settlements when in need of liquidity. Initially, each bank will contribute at least RMB 15 billion (about \$2.2 billion) in renminbi or dollars, to the new reserve pool. Participating central banks will not only be able to withdraw their own contributions but will also have access to additional funding through a collateralized liquidity window.
- ^{vii} In line with this, Cheung et al. (2021) find that the evolution of offshore renminbi trading between 2016 and 2019 is not only determined by trade relationships, as in earlier years, but also geopolitical disputes.
- ^{viii} Since 2020, the countries with the largest share of official foreign exchange reserves in renminbi have included Russia (17%) and Tanzania (16%) (see Arslanalp et al. 2022).
- ^{ix} This is according to SWIFT (see *RMB Tracker - Monthly reporting and statistics on renminbi (RMB) progress towards becoming an international currency*, October 2022, <https://www.swift.com/our-solutions/compliance-and-shared-services/business-intelligence/renminbi/rmb-tracker/rmb-tracker-document-centre>).
- ^x The Chinese currency is thus behind not only the dollar but the euro, the yen, sterling, the Australian and Canadian dollars and the Swiss franc.
- ^{xi} This according to the IMF Direction of Trade Statistics (DOTS) database. Baldwin and Freeman (2020) argue that the dependence on Chinese imports is even more important if one considers indirect international linkages through global value chains.
- ^{xii} The internationalization of the RMB abruptly reversed in 2015, when China's economic policy became less predictable and domestic economic prospects more uncertain, leading to the reversal of expectations on the RMB exchange rate (Aglietta and Macaire 2019). Approximately USD 1.5 trillion flowed outside China between mid-2014 and late 2016. In the aftermath of those bouts of market unrest, the authorities chose to switch their focus back to financial stability and to slow down the process of liberalization by reintroducing some restrictions on international flows.
- ^{xiii} In the 1950s, the dollar became the unrivalled leading international currency while the U. S. ran trade surpluses. Western European countries accumulated dollars through US Foreign direct investments rather than through purchases of US government securities. In 1960, foreign acquisitions of U.S. securities totalled \$2 billion, while outflows of U.S. capital through private and government loans and grants reached \$6 billion.
- ^{xiv} This opening also provided outbound investment channels for authorized Chinese investors.
- ^{xv} Alternative schemes (Qualified Foreign Institutional Investor or QFII, RMB Qualified Foreign Institutional Investor or RQFII, CIBM Direct) had provided access to the domestic securities market but with more restricted access and heavier procedures.
- ^{xvi} This matters, insofar as investors with index-tracking mandates need to purchase and hold Chinese assets. Chinese bonds were included in Bloomberg's Barclays Global Aggregate Bond Index (with a weighting of 7.8%

in 2019), in JP Morgan's Government Bond Index for Emerging Markets (with a weighting of 10% in 2020), and in the FTSE Russell World Government Bond Index (with an estimated weighting of 5.3% in 2021).

^{xvii} Most notably, foreign investors have used investments in Variable Interest Entities (VIEs), opaque corporate structures designed to circumvent controls that restrict foreign ownership in key industries. For example, whereas the national statistics for 2017 list the United States as holding USD 154 billion in Chinese common equities, Coppola et al. (2021) find the position to be worth about USD 700 billion. They also find that the euro area's exposure to Chinese equities exceeds USD 320 billion, more than triple the value listed in official statistics.

^{xviii} As Clayton et al. (2022) further stress, the Central Bank of Russia is by far the largest disclosed holder of RMB bonds. After the annexation of Crimea in 2014 and sanctions that followed, Russia dramatically cut its official holdings of USD reserves in 2017 and 2018, and rebalanced into RMB and EUR. As a result, Russia increased its holding of RMB denominated reserves from under USD 1 billion in the second quarter of 2017 to around USD 67 billion in the second quarter of 2018.

^{xix} The fixing rate is determined daily by the PBoC; exchange rate movements on the Chinese onshore market are subject to a daily trading band of $\pm 2\%$.

^{xx} The logic being that capital account liberalization implied larger capital inflows and outflows, which in turn made it more costly to hold the exchange rate stable.

^{xxi} The Chinese authorities added a "countercyclical adjustment factor" in May 2017 to maintain margins of action and control over the value of the RMB in the event of a crisis. The goal was to counter market movements if they were considered "irrational" and "procyclical". Officially, banks calculate this factor based on their own risk perceptions. But its implementation was primarily seen as a discretionary tool, used by the authorities to regain control of the exchange rate if necessary (IMF, 2019).

^{xxii} Onshore market makers and offshore investors need to establish a mutual counterparty relationship through the trading links before transactions.

^{xxiii} The Fed provides unlimited swaps lines in the form of standing facilities to the Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank and the Swiss National Bank.

^{xxiv} Argentina activated its RMB swap line in 2014, but the RMB so obtained was reportedly exchanged for dollars on international markets to enable Argentina to purchase imports from third parties (Steil and Walker 2015). The Central Bank of Sri Lanka (CBSL) and the PBoC entered into a currency swap agreement for CNY 10 billion (about USD 1.5 billion) in March 2021. The amount available under the swap agreement was included in the CBSL's statement of official foreign reserves in December 2021, raising reserves to USD 3.1 billion by the end of 2021. However, in May 2022, CBSL's governor said that the Chinese swap could not be used for any purchases at the moment due to the conditions of the swap laid out by the PBoC. Press reports suggest that Sri Lanka had to have sufficient foreign reserves to cover imports for several months to be able to use the PBoC's swap funds (see e.g. <https://stratnewsglobal.com/neighbours/sri-lanka/1-5-bn-china-lanka-currency-swap-deal-came-with-impractical-conditions/>).

^{xxv} These agreements are also seen as a form of financial statecraft designed to achieve foreign policy ends (McDowell, 2019).

^{xxvi} In addition, in March 2020, with the sudden spread of COVID-19, the Fed created the Foreign and International Monetary Authorities (FIMA) repo facility to offer repo lines to a larger range of foreign central banks (Perks et al. 2021). On 28 July 2021 the Fed converted FIMA into a standing facility.

^{xxvii} Although the effect they identify is economically small.

^{xxviii} There are several strings attached to CMIM swaps, however. In particular, only the first 40 percent can be accessed unconditionally; in order to access the remainder, a country must first negotiate an agreement with the International Monetary Fund.

^{xxix} The other central banks in question are Bank Indonesia, Bank Negara Malaysia, the Hong Kong Monetary Authority, the Monetary Authority of Singapore, and the Central Bank of Chile.

^{xxx} A British bank wishing to pay a specified amount of RMB on behalf of a domestic client who has purchased goods from China, for example, can pay that amount (in sterling) to China Construction Bank (CCB), the official RMB clearing bank in London, which can then in turn credit the RMB account of the Chinese exporter in one of CCB's onshore branches. Similarly, a British company exporting to China and accepting payment in RMB will see its RMB account at the CCB (or at a British bank with which the CCB has a correspondent relationship) credited in the requisite amount.

^{xxxi} Domestic payments are processed through the China National Advanced Payment System (CNAPS).

^{xxxii} 164 from Europe, 29 from North America, 43 from Africa, 23 from Oceania, and 17 from South America

^{xxxiii} In practice, the currency composition of Chinese imports and exports (inferred from invoicing data) is very evenly balanced.

^{xxxiv} Official sources are used for the United Kingdom and Russia.

^{xxxv} Previous studies on bilateral features of reserve holding used data on USD and EUR only. All estimates here are obtained by OLS.

^{xxxvi} The sample includes Australia, Belgium, Brazil, Chile, Ecuador, Georgia, Germany, Ireland, Israel, Mauritius, Mexico, Moldova, Norway, Morocco, Norway Peru, Portugal, Seychelles, Switzerland, Ukraine, United Kingdom, Uruguay, Russia. It is important to note that the sample does not include countries of the ASEAN that have the strongest trade and political relationship with China. Thus, we expect that our sample is likely to underestimate the correlation between trade and RMB holdings.

^{xxxvii} Membership of the euro area and presence of one RMB clearing bank are negatively associated, in contrast. The coefficient on the MoU with China in the context of the Belt and Road initiative is statistically insignificant.

^{xxxviii} This result does not hold for countries where China is the largest destination for exports (column 5).

^{xxxix} Traditionally, the Bank's reserve portfolio was comprised entirely of dollars, euros and pounds sterling. In addition to adding the RMB, it also added Canadian dollar, Australian dollars and Japanese yen.

^{xl} Around 90-95 percent of US imports are invoiced in USD (Gopinath, Itskhoki and Rigobon 2010; Boz et al. 2022), while about half of euro area trade in goods is invoiced in EUR (ECB 2021). Because we lack country-specific monthly data on invoicing in RMB, however, we cannot precisely incorporate this effect into our econometric framework.

^{xli} Due to data limitation, we use the share of trade invoiced in dollars and euros for 2018 and apply it to our whole timeframe.

^{xlii} Boz and al. (2022) show that US imports are denominated at 95% in dollars, on average, since 2010.

^{xliii} This is a caveat, since invoicing and settlement might differ – also, the currency-composition of Chinese imports and exports might differ, we just have the average share of RMB-denominated international trade.

^{xliv} We use a subset of the data of Boz et al. (2022), which provides annual data on trade invoicing in RMB for 47 countries. We compare these data to those on reserve holding used previously.

^{xlv} The small number of countries in the cross-section, as well as the granularity of the data (yearly) prevent us from using the Boz and al. dataset on trade invoicing in RMB in our econometric models.

^{xlvi} In the event of too strong a downward movement in the offshore market, the PBoC has also intervened by draining liquidity from the CNH (i.e. offshore RMB) market. In 2016, facing foreign exchange tensions, the PBoC reportedly intervened in the Hong Kong offshore market, buying RMB in Hong Kong to tighten liquidity in an effort to reduce short positions against the currency (Fitch Ratings 2016).

^{xlvii} This, according to press reports (see e.g. Financial Times, “China opens new front in war on speculators”, 11 January 2016).

^{xlviii} Furthermore, the RMB-denominated bonds outstanding in this offshore market (dim sum bonds) are mainly high-yield and therefore not in safe assets of the sort that appeal to central bank reserve managers. The market in Dim Sum bonds amounted to approximately RMB 400 billion as of early 2018. But the end of the continuous appreciation of the RMB in 2014 and then the financial crisis of 2015-2016 put a stop to the expansion of this market. Although the offshore market is actually small, what matters for foreign central banks to hold RMB is the expectation that the PBoC can supply large amounts of dollars through this market if needed.

^{xlix} Adding the foreign assets of commercial banks, the foreign asset stock rises to USD 4.5 trillion.

^l Central banks were prepared to hold dollars as reserves, at least in part, because the Fed guaranteed the conversion of such reserves into gold at a fixed price, as had traditionally been the case. There was a short exception in 1933-4, when Franklin Delano Roosevelt suspended convertibility for 9 months – and the dollar lost ground as an international and reserve currency as a result (Eichengreen, Mehl and Chitu 2017).

^{li} This was the basis of the Bretton Woods agreements in 1944. In the United States, the prohibition on citizens holding gold and on financial institutions exchanging dollars for gold dates back to the New Deal (Executive Order 6102 in 1933, and the Gold Act of 1934).

^{lii} Note, as history has its complexities, the London gold market was denominated in sterling, but it was common for market dealer to quote the dollar gold rate for this market.

^{liii} The Chiang Mai Initiative Multilateralization (CMIM) could be the natural organization to start such a cooperation.

^{liv} U.S. allies also pledged not to buy gold on the London gold market.

^{lv} Our argument focuses on reserves held for liquidity purposes, mostly to finance trade. Further work should also explore the “investment tranche” of foreign reserves, that is mostly long-term assets that are not held for purposes to finance trade or external debt but may depend on financial return and geopolitical reasons. Geopolitical reasons and an attractive Sharpe ratio could also incentivize foreign central banks to hold more RMB for long-term purposes, despite the uncertainty associated with Chinese administrative controls on capital outflows.