PRELIMINARY DRAFT

Exchange Rate Policy

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China has forged an innovative policy path since the launch of reform and opening, and has pursued it with resolve against the opinionating of outsiders. In no realm has criticism been more vociferous than that of exchange rate policy. Overall, China has taken a gradual approach to reform – piloting experimental programs, undertaking change in stepwise increments, and resisting western dogma. Early on, the pre-eminent American voices advocated for a "big bang" approach. By this view, freeing up the exchange rate was foundational. Milton Friedman himself delivered the message to Communist Party Secretary Zhao Ziyang in 1988 on a well-hyped visit to China. A staunch believer in free markets, Friedman took the exchange rate as the cornerstone of market pricing in a globalized world. His advice to Secretary Zhao was to free up the exchange rate and open the Chinese economy to international trade posthaste. China's domestic prices could then align with global scarcity values to guide efficient allocation of resources and move the economy along a path of rapid growth.

I had followed Friedman's pronouncements with such doubt as an assistant professor of economics might dare toward one of the great luminaries of our profession. When Friedman then visited my outpost at the University of Hawaii in February 1989, it was with great trepidation that at a luncheon in his honor I broached the issue of his position on freeing up the renminbi exchange rate. Much to my relief, he responded that Secretary Zhao had convinced him that would not work. I have always regretted that in the dizzying turn of the moment I failed to ask the professor what Secretary Zhao said to dissuade him from his free market convictions. I can only imagine how Zhao's argument might have gone. Given substantial deviation in China's relative prices from their global counterparts, forcing a sudden reconfiguration would have been massively disruptive to business viability, employment, income flows, and economic life writ large.

So it goes that through the ensuing decades the renminbi (Rmb) exchange rate has remained under strategic management. This chapter tells the story. Part I takes a chronological approach to laying out the record of exchange rate policy from a factual standpoint. Part II then digs into the controversy over China's alleged "currency manipulation" and more recent concerns about hidden forex market intervention off the central bank balance sheet. Part III seeks to make sense of it all. Part IV offers a conclusion.

I. The Record

China's reform era exchange rate policy has evolved through four distinct phases. Starting out in 1979, foreign exchange market policy adhered to the broad reform strategy of opening a competitive market tier of activity in parallel with the command economy, with the weight of transactions then shifting gradually toward a free market endgame. This initial phase of forex market reform ended in 1994 with unification of the exchange rate and the demise of the blackmarket. Under the next phase the unified exchange rate was framed as "based on market supply and demand" with the People's Bank of China (PBoC) yet very much involved in supply and demand to maintain stability against mounting pressure for the Rmb to appreciate. The break from the de facto peg came in 2005 with an initial 2.1 percent Rmb revaluation to mark the third phase of reform involving greater exchange rate flexibility. Nevertheless, a continued link to the US dollar as the dollar appreciated relative to other currencies lifted the value of the Rmb to a level that by 2015 was perceived by the market as untenable. Capital outflows surged putting the PBoC on the defensive to shore up the Rmb at great cost to its reserves. This experience motivated a transition to a fourth phase of reform beginning in 2016 in which the PBoC developed levers beyond direct forex market intervention to influence market outcomes.

Details follow.

1979-1994: Dual Track Reform

At reform outset, China's command economy operated within an airlock that effectively sealed off domestic prices from the global marketplace. Foreign exchange receipts from exports had to be remitted to the Bank of China at an administered exchange rate to in turn be allocated toward imports according to plan dictates. Under this system, the exchange rate served only an accounting function with no bearing on economic decisionmaking. Insofar as exporting generally incurred losses while importing was profitable, the Rmb would appear to have been overvalued. Nevertheless, with relative prices in China much at odds with those on global markets, some items were cheap enough domestically that exporting would have been profitable, notably staple consumer goods distributed under rationing at low cost. This is the backdrop against which Secretary Zhao persuaded Professor Friedman that immediate decontrol of the exchange rate was not practicable.

To move stepwise under such conditions, China devised a 'dual-track' approach to reform whereby the plan component of the economy remained intact while markets were allowed to open up in parallel and dominate the space for growth. In the realm of foreign trade and payments, two major initiatives led the way in 1979. One was the formation of an entity to manage China's foreign reserves, the State Administration of Foreign Exchange (SAFE, briefly called the State Central Administration of Foreign Exchange). Initially, SAFE was affiliated with the Bank of China which was spun off from the all-encompassing People's Bank of China (Bank of China, n.d.), with the State Council nonetheless holding direct oversight. Over the next few years, the State Council, along with the whole of government, was radically downsized (Clarke, 1984) and the state monobank was broken up. On the other side of this restructuring in 1984, the People's Bank of China (PBoC) had been carved out as a central bank and SAFE was lodged within it (Liu, 2023).

The other major initiative of 1979 was the granting of retention quotas to foreign exchange recipients on a portion of their receipts. The hard currency could be spent on imports with approval or sold at better than the official rate to authorized importers with the Bank of China acting as broker. Hard currency trading was localized, with procedures and negotiated exchange rates varying across cities (Mehran, et al., 1996: 57). As the volume of exports and retention quotas ramped up, the need for a more formal trading platform was met with "swap centers" (where the term applies to spot trading with no associated forward contract). The first swap center was established in Shenzhen in 1985 with the numbers multiplying to reach 108 by the end of 1993 (Pan, 2019). Not until March of 1993 was the market unified nationally with the Shanghai swap center providing clearing services under the precursor to the China Foreign Exchange Trade System (CFETS), which would be formally launched in April 1994. (Mehran, et al., 1996: 59).

Foreign exchange market segmentation resulted in a multiplicity of exchange rates. An official rate of 1.6 Rmb/USD carried through from 1978 as a legacy of the command economy era. At this rate, exporting of manufactured goods was unattractive. To incentivize export development, an "internal settlement rate" was introduced in 1981 at 2.8 Rmb/USD to apply to merchandise trade, with the official rate holding for such non-trade purposes as remittances. (Lin and Schramm, 2003: 251). The internal settlement rate also applied to foreign exchange certificates (FEC) obtainable by foreign nationals for spending on tourism services and in Friendship Stores that sold imported goods and domestically produced luxuries. By the time the swap centers opened in 1985, the official rate had been devalued to the internal settlement rate which was then abolished with the official rate becoming the basis for FEC purchases.[1] The rates offered at swap centers depended on local conditions but the general trend over time responded to market pressures for Rmb devaluation, with the official rate trending toward the swap rate. Still, given excess demand for foreign currency within the formal apparatus, a black market flourished. In early years of the reform era, this largely amounted to individuals operating on the streets in neighborhoods frequented by foreigners. The presence of entrepreneurial Uyghurs in this niche motivated allusions to the "Bank of Xinjiang"[2]. By later in the decade, well ensconced storefront businesses offered foreign currency trading at volumes that readily accommodated the needs of a cash based clientele.

Through the 1980s and early '90s, the dual-track framework gave rise to a burgeoning market sphere that shifted the weight of the economy away from government planning. By 1993, 80 percent of official forex transactions were taking place at swap market rates (Wang and Lin, 2003: 6). The black market was withering away, edged out by a swap rate that equilibrated demand and supply. The foundation had been laid for exchange rate unification on a market based track.

[1] For a graphical presentation of the movement of China's various exchange rates from 1979 to 2007, see the PBoC report posted on the website of the Bank for International Settlements (PBoC, n.d.), https://www.bis.org/publ/bppdf/bispap44h.pdf.

[2] Internet search engines turn up no trace of a Uyghur presence in foreign exchange trading in early reform era China. The phenomenon seems to have eluded recorded history, but the memories linger among those on the scene.

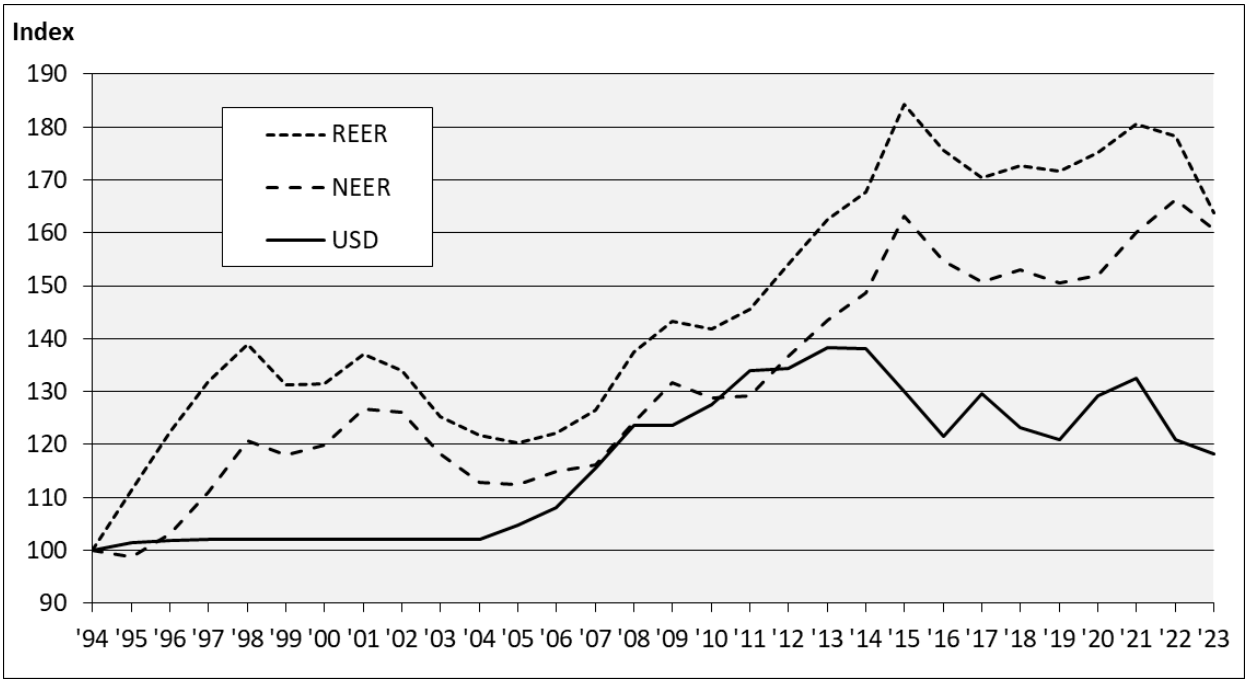
1994-2005: Unification at a Dollar Peg

The exchange rate was unified on January 1, 1994 at the swap market rate of 8.70 Rmb/USD. This represented an 80 percent devaluation from the 1978 official rate, with a large part of that decline offsetting higher inflation in China than in the US. The reform was officially characterized as establishing "a managed floating exchange rate regime based on market supply and demand." (PBoC, n.d.) To be sure, the market was highly concentrated on both sides, the PBoC standing behind 60-70 percent of purchases and the Bank of China behind sales at a similar magnitude (Lin and Schramm, 2003: 259).

The quoted rate is a "central parity" set daily by the PBoC with trading permitted within a band. This framework of a central parity, or "fixing", and a trading band has been sustained to the present (2024). Initially the band was restricted to +/-0.3 percent. The central parity was determined each day as a weighted average of rates on the previous day's transactions. This system allowed the exchange rate to respond gradually to market pressure.

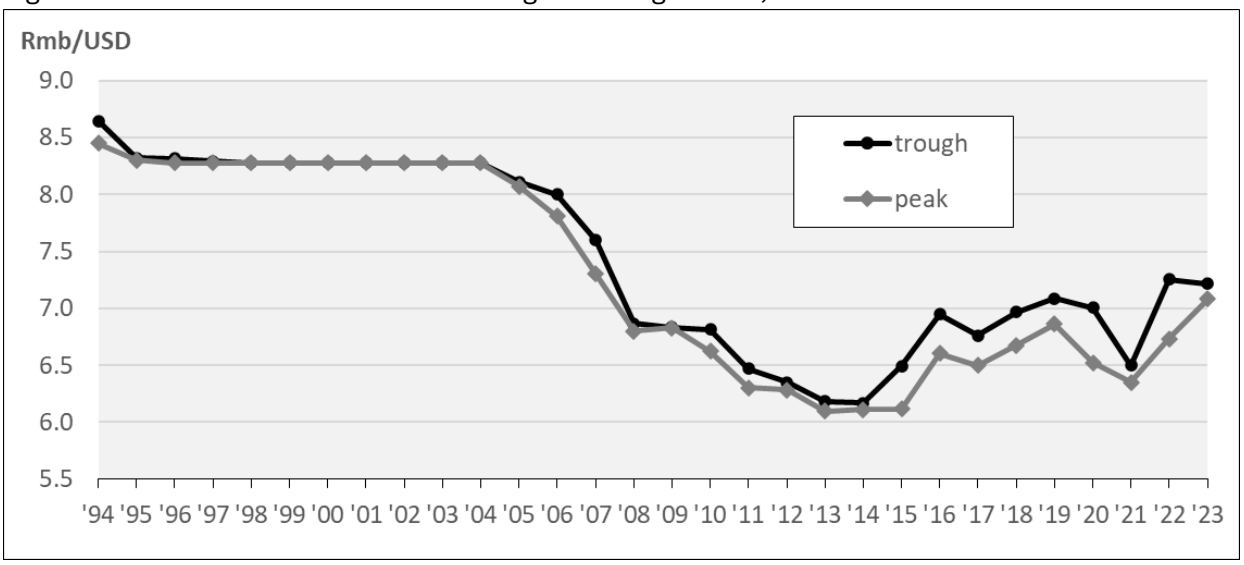
The first year of operation saw the Rmb appreciate from 8.70 to 8.45 Rmb/USD and by the end of 1996 it had reached 8.30 Rmb/USD, after which it stabilized versus the US dollar. Meanwhile, the dollar was appreciating relative to other currencies and inflation was higher in China than in the US such that by the end of 1998, the Rmb had appreciated by 21 percent in nominal effective terms and 39.0 percent in real effective terms, as shown in Figure 1. A tightening fix to the USD applied to day-to-day variation as well as trend. A standard deviation of 8.0 in 1994 shrunk to less than less than 0.1 by 1998 carrying through to 2004. Annual peak and trough values became indistinguishable, as shown in Figure 2.

Figure 1. Rmb Nominal and Real Effective Exchange Rates and USD Rate, 1994-2023



Data source: IMF International Financial Statistics.

Figure 2. Rmb/USD Annual Peak and Trough Exchange Rates, 1994-2023



Data source: State Administration of Foreign Exchange.

A number of factors contributed to the demise of China's nascent exchange rate flexibility. To strengthen its hand in negotiating entry into the World Trade Organization (WTO), China pushed through current account convertibility in 1996, three years ahead of schedule (Lin and Schramm, 2003: 259), and then acceded to the WTO in 2001. A stable exchange range reduced uncertainty for enterprises entering the global fray. Then in 1997 the Asian Financial Crisis hit. As currency values plummeted around the region, China took a stand to be "a responsible country in the world" by vowing to resist competitive devaluation (PBoC, n.d.). While this no doubt served the region, it also served China by deterring capital flight. Finally, China's financial system lacked the sophistication to support competitive foreign exchange trading and to provide the hedging instruments needed to cope with exchange rate volatility. Time was needed to implement banking reform.

By 2005, the Bank of Communications, the Bank of China, and Construction Bank had taken on foreign investors and completed joint-stock reorganization, and the groundwork was being laid for the Industrial and Commercial Bank and Agriculture Bank to follow suit (Hu, 2010). Foundations were in place for market-oriented banking services to take off. Meanwhile, pressure had been building to break with the peg. China's WTO entry had unleashed an export boom. Rising current account surpluses and reserve accumulation impinged on monetary policy domestically and provoked outcries against currency manipulation from abroad. Speculative capital was flowing in betting on appreciation. The time had come.

2005-2015: Dealing with Imbalances

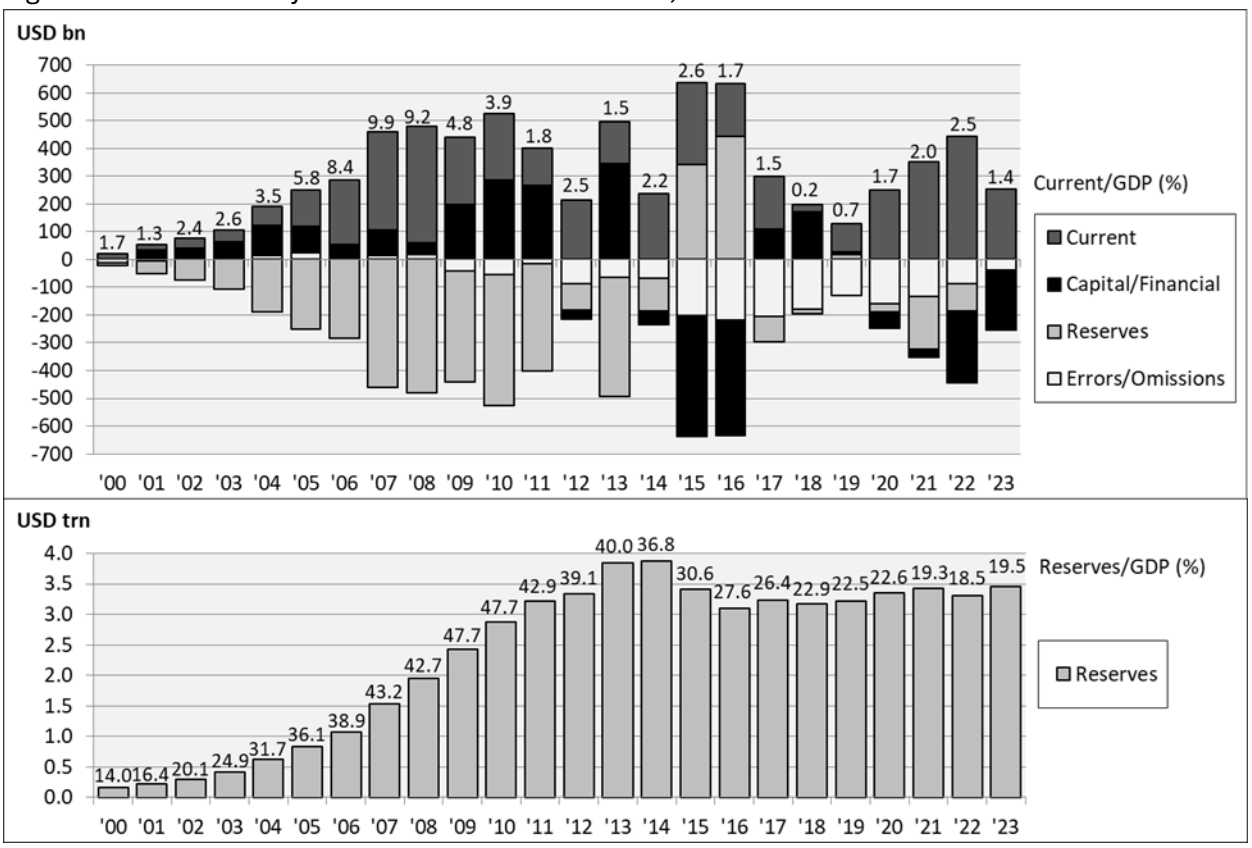
China broke with its peg on 21 July 2005 with a 2.1 percent revaluation of the Rmb against the USD. This move was in keeping with a strategy of incremental steps and in defiance of the argument that a gingerly advance would only leave the market expecting more and thus aggravate capital inflows. In the event, expectations for Rmb appreciation eased and the transition was well absorbed by businesses and households according to the PBoC (Monetary Policy Report, Quarter Three, 2005: 2). Forward rates on the domestic market and the offshore nondeliverable market

converged to levels consistent with reduced Rmb appreciation expectations and related dissipation of offshore speculative pressure (PBoC Monetary Policy Report, Quarter Three, 2005: 29). The revaluation was accompanied by the announcement of "a managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies." Additional language figuring routinely in PBoC Monetary Policy Reports had the Rmb exchange rate "at an adaptive and equilibrium level." This messaging set the tone for greater flexibility of the Rmb versus the USD. Commensurately, the PBoC launched currency and foreign exchange swaps and an interbank market in forwards in support of hedging.

Within the maintained framework of an administered central parity surrounded by a trading band, the PBoC maneuvered over the next decade to increase exchange rate flexibility and expand access to foreign exchange trading. The trading band was widened from +/-0.3 percent to +/-0.5 percent in April 2007, then to +/-1 percent in April 2012, and to +/-2 percent in March 2014. In 2007, the annual foreign exchange purchasing quota for individuals was raised from $20,000 to $50,000, where it remains (as of 2024). An outlet for overseas portfolio investment was established in 2006 with the Qualified Domestic Institutional Investor program, the counterpart to the Qualified Foreign Institutional Investor program created for portfolio investment inflows in 2002.

Relative to the peg value of 2005, by the end of 2013 the Rmb had appreciated by 35.8 percent versus the USD (Figure 1). Most within-year variation came from trend movement rather than short-term volatility, as can be discerned in peak and trough values converging during years of diminished trend movement (Figure 2). Despite a permitted daily trading band of +/-1 percent versus the USD in 2013, the largest intra-day appreciation for the year was 0.20 percent, the largest depreciation 0.15 percent (PBoC, Monetary Policy Report 2013, Quarter Four: 18). The PBoC thus kept a tight hold on volatility even as it responded over time to sustained balance of payments pressure. And balance of payments pressure was heavy. China's current account surplus reached 9.9 percent of GDP in 2007 and was above or near 5 percent from 2005 to 2009, as shown in Figure 3. While diminishing somewhat after that, the surplus on the capital and financial account shot up to force continued strong reserve accumulation to hold the line against Rmb appreciation. By 2013, foreign reserves had risen to $3.85 trillion from less than $1 trillion in 2005, as shown in Figure 3.

Figure 3. Balance of Payments and Reserve Positions, 2000-2023



Data source: IMF International Financial Statistics.

Reserve accumulation at this pace transmits a powerful impetus to base money that must be countered to avert inflation. The PBoC succeeded in containing growth in the broad money supply by increasing the reserve requirement ratio and sterilizing its foreign exchange purchases through the sale of central bank bills to commercial banks. The reserve requirement ratio for the largest banks was raised from 6 percent in 2003 to as high as 21.5 percent in 2011 (Ma et al., 2011: 3). Central bank bills outstanding at the end of 2011 reached Rmb 1.9 trillion to neutralize nearly $300 billion in forex holdings (PBoC, Monetary Policy Report 2011, Quarter Four: 14). China's state capitalism made such control possible. In a market economy the cost to the central bank of paying interest on central bank bills and the cost to commercial banks of tying up funds in low-return reserves and central bank bills would have been untenable. In China, however, the PBoC could repress interest rates on retail deposits allowing it to in turn pay low interest on central bank bills and commercial bank reserves while still keeping the banking system profitable.

In 2014 the tide began to turn. The dollar was appreciating sharply and the Rmb tracked with it to appreciate in effective terms (Figure 1). Market perception swung to a view that the Rmb was overvalued (Das, 2019: 8). On fear of Rmb depreciation, the capital and financial account shifted to a net outflow position that burst large in 2015 and 2016 (Figure 3). Much of the basis for net capital outflows involved export earnings not immediately being converted to Rmb and short-term foreign debt being repaid with new borrowing not keeping pace (Long, 2019: 2), as as incentivized by expectations of currency depreciation. Against the resulting downward pressure on

the Rmb, the PBoC provided support at a cost of $787 billion in reserves (Figure 3). This disturbing episode motivated the next phase in foreign exchange market development.

2015-2023: Loosening the Dollar Tie

The dramatic capital outflows and reserve drawdowns of 2015 and 2016 drove home a couple of lessons. First, a close tie to the US dollar creates vulnerability to broader currency misalignments. Second, herding behavior in response to changing market perceptions can trigger capital flows that in the moment lurch far out of line with fundamentals. Evolution in China's exchange rate management since 2015 has drawn from these lessons.

Changes in the central parity formation mechanism have taken aim on both fronts. Although the 2005 reform had specified "reference to a basket of currencies", practice did not follow to this principle. From 2011 to 2014, the Rmb clung to the dollar as the dollar itself appreciated mightily, taking the Rmb along with it relative to a basket (Figure 1). The PBoC responded belatedly to market pressure with a 1.9 percent devaluation versus the USD on 11 August 2015 which it followed with further devaluations over the next two days for a cumulative 3.5 percent move. That panic ensued is not surprising in hindsight. The PBoC did not explain its departure from past practice or its intentions for the future until after a state of alarm had erupted (Prasad, 2017: 90). That the maneuver came hard on the heels of government bumbling of a stock market bubble (Salidjanova, 2015) meant investors were already on edge. To pre-empt such sudden, psychologically jarring adjustments in the future, the PBoC in December 2015 created a CFETS basket index to support timely basket tracking (Dai, 2016). Since then, within-year fluctuations in the Rmb/USD rate have been noticeably greater (Figure 2).

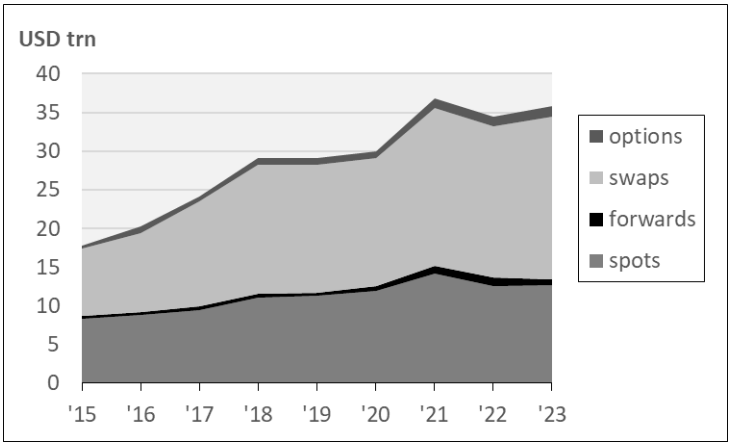
A second innovation in the central parity mechanism has addressed herding behavior. Announced in May 2017, the reform incorporates a "counter-cyclical factor" into the fixing based on daily reporting of market-making banks as to their sense of "economic fundamentals and market conditions" (PBoC, Monetary Policy Report 2017, Quarter Two: 30). The counter-cyclical factor is intended to weigh against the procyclical tendencies of the market that impart a bias toward overshooting. When excess demand for the dollar is driving an upswing for example, more buyers may be drawn into the market to take advantage of expected further gains thus amplifying the movement. To counter such herding behavior, the counter-cyclical factor increases the weight of the basket versus the previous USD closing rate in setting the central parity. In an empirical study of the counter-cyclical factor, Jermann et al. (2021) found that when activated it reduces the weight of the market pillar in the fixing versus the basket pillar from 50 percent to 30 percent.

Further to the aim of containing procyclical risk in the foreign exchange market, the PBoC has since 2015 developed macroprudential policy tools (PBoC, Monetary Policy Report 2015, Quarter Four: 24-25). Specifically, it has introduced: (i) a risk reserve requirement on forward sale contracts (including futures and swaps) and higher commissions on activity exceeding normal levels; (ii) limitations on cross-border financing by financial institutions and enterprises related to their capital strength; and (iii) a reserve ratio on deposits of overseas financial institutions in domestic financial institutions. Within this macroprudential regulatory framework, parameters can be adjusted in response to changing conditions. Not only do the adjustments bear directly on behavior, announcement of them influences expectations to counter speculative sentiment (PBoC,

Monetary Policy Report 2020, Quarter Four: 28). The importance more generally of communication to guide expectations under a market-based exchange rate regime has become a recurring theme in PBoC reports (e.g., PBoC, Monetary Policy Report 2022, Quarter Four: 12).

Ultimately, greater space for relaxation of currency management will come from greater Rmb internationalization. China aspires to this with a vision to "improve its ability to allocate resources globally" (Central Committee of the Chinese Communist Party: 145, 16). Achieving inclusion of the Rmb in the IMF's Special Drawing Rights basket effective 1 October 2016 was seen as a promising step for the international sale of Rmb bonds, with an eye to foreign central banks as buyers (CFETS, 2016). Yet as of 2023, only 2.1 percent of the world's official reserve assets were held in Rmb (IMF COFER database) with Russia accounting for one-third of that (Arslanalp, 2022). The Rmb share in international trade settlement is of similar magnitude at 2.5 percent as of 2023, and this has been achieved with much effort on the part of the Chinese government (von Beschwitz, 2024). Though small, this presence in world trade and finance has materialized from virtually nothing in less than a decade. Rmb trading volume roughly doubled between 2015 and 2023, as shown in Figure 4, with most of the growth in swaps to enable hedging. In 2022, the Rmb share in global currency trading was 3.5 percent placing it fifth behind the US dollar, the euro, the yen, and the pound (Bank for International Settlements, 2022). That compares with a 2013 share of 2.2 percent with a ranking of ninth. Thus, while China has been gaining ground, as the world's second largest economy and largest exporter it still hits below its weight with respect to its currency.

Figure 4. Foreign Exchange Market Trading Volumes, 2015-2023



Data source: State Administration of Foreign Exchange.

Assessment

Since the start of reform and opening, foreign observers have envisioned a faster and more transformative trajectory than has in fact materialized. In 1996, IMF analysts foretold that "full convertibility of the renminbi may well come soon after current account convertibility." (Mehran et al., 1996) In 2003, Lin and Schramm judged that "China has moved to the last frontier of its foreign exchange reform." Yet as of 2024, the exchange rate remains well stabilized and capital controls remain broadly in place. Meanwhile, the IMF continues to push for more exchange rate flexibility

and less capital flow management (e.g., Article IV, 2023: 31). On that note, we turn attention to the criticism that has been heaped on Chinese policy.

II. Dissension in the Gallery

China's enduring trade surpluses have provoked charges of "currency manipulation", rendered in quotes because under the IMF Articles of Agreement the term takes on specific meaning beyond generic foreign exchange market intervention. To wit, Article IV states that members shall "avoid manipulating exchange rates or the international monetary system in order to prevent effective balance of payments adjustment or to gain an unfair competitive advantage over other members" (International Monetary Fund, 2020: 6). Thus, intent matters. Despite much pressure, the IMF has never accused China or any other country of currency manipulation. The US Treasury has, nonetheless, levied the charge against China in five years – 1992-1994, 2019, and 2020. Incongruously, these were years of relatively small Chinese trade surpluses.

We begin with a review of the charges of currency manipulation during the period up to 2014. We then consider arguments in favor of China pegging its currency. Finally, we report on contemporary concerns about China's lack of transparency and use of unconventional channels of exchange market intervention off the central bank balance sheet.

"Currency Manipulation"

How big a deal was China's currency peg? In the summer of 2003, it was "the number one economic and financial issue in the United States" based on the Nexus-Lexus database of business newspapers and magazines (Eichengreen, 2004). In that year, China's trade surplus amounted to 2.6 percent of GDP and its official reserves stood at $412 billion (Figure 3), so things were just warming up.

Estimates of the magnitude of undervaluation have varied greatly. On the high side, researchers from the Peterson Institute for International Economics, in testimony before the US Congress, put undervaluation versus the US dollar at 15 to 25 percent in 2003 (Goldstein, 2003), raised the figure to to 40 percent in 2007 (Goldstein, 2007), and kept it there in March 2010 (Bergsten, 2010a), although in later testimony dated September 2010 (Bergsten, 2010b) brought it down to 25 percent in light of updated IMF trade projections. That the Rmb had actually appreciated versus the dollar by 17.5 percent between the pre-2005 peg and the end of 2009 suggests the elusiveness of the target. And that updated IMF trade projections could shift the estimate of undervaluation from 40 percent to 25 percent hints at the sensitivity of the exercise. The estimates are derived from an "underlying balance" approach where the benchmark is taken as a current account surplus that accords with a "normal" level of net capital inflows set at 1.5 percent of GDP (Goldstein and Lardy, 2006). Within a global trade model, elasticities of import demand and export supply then determine how much Rmb appreciation is needed to close the gap between the projected current account balance and the benchmark.

At the opposite extreme, some have taken a position that little if any undervaluation ever existed. Cheung et al. (2007) estimated an equilibrium exchange rate using a model that relates the real exchange rate to per capita income with application to a panel dataset of 160 countries for the

period 1975-2004. They found that although the Rmb was undervalued relative to the benchmark in terms of point estimates, the gap was not statistically significant under any model specification. Similarly, the IMF in 2003 went on record stating "there is no clear evidence that the renminbi is substantially undervalued", although no Article IV Staff Report was released that year, only a Public Notice, and the assessment was qualified with the preface "Most Directors noted …". By 2010, according to the Washington Post, the IMF put undervaluation at "as much as 25 percent" although this assessment was ultimately deleted from the Article IV Staff Report of record (Schneider, 2010). Eichengreen (2003) characterized the issue as "largely political" and went with an undervaluation of 5 percent. When in 2005 China revalued by 2 percent, he reacted that the decision was "broadly correct", conditional on greater market-based variability going forward (Eichengreen, 2006).

The fundamental problem in identifying Rmb undervaluation is that there is no definitive reference against which to judge valuation. Believers in Rmb undervaluation have pointed to China's sustained, large current account surpluses coupled with PBoC reserve accumulation as evidence. Central bank intervention is, of course, inherent in the legitimate maintenance of a pegged exchange rate. The transgression comes when the central bank sterilizes its intervention to block the adjustment mechanism that would bring about rebalancing through domestic prices and incomes.

Much of the case against currency manipulation has been couched in terms of "China's own good" (Goldstein and Lardy, 2007). By freeing up the exchange rate – or at least not sterilizing PBoC intervention and allowing rising prices to bring about appreciation in real terms – the PBoC would gain space to conduct an independent monetary policy. Banks would be freed to pursue market driven lending and offer higher returns on household savings to fuel consumption. Rising consumption relative to income would shrink the saving-investment gap and with it the export-income gap as expenditure switching drove domestic demand to replace external demand. Finally, as the financial system matured, capital controls could be relaxed. With all this, China would refashion itself in the West's image.

Despite vociferous urgings, through the height of China's trade surpluses the US Treasury, much less the IMF, never did label China a "currency manipulator". Even so, by 2013 the Rmb was given to appreciate by nearly 40 percent relative to its pre-2005 USD peg, and with that the current account surplus narrowed to 1.5 percent of GDP. By 2014, a Peterson Institute post pronounced the Rmb "fairly valued" (Kessler and Subramanian, 2014), and the IMF came to a similar conclusion (IMF, 2015: 13). Yet any story that Rmb appreciation resolved the imbalances is on closer inspection not very convincing. Most of the appreciation took place by 2008 during which time the current account surplus surged from $69 billion in 2004, the year before the break with the peg, to $421 billion. On slower appreciation after 2008 the surplus did come down off its peak, but this does not make for a pattern. Other factors are due for consideration.

In Support of Pegging

While the outcry against currency manipulation dominated discourse in the US, voices in support of a currency peg did exist. We consider the arguments of Robert Mundell and Ronald McKinnon.

As the critics took their case to the US Congress and the American news media, Mundell, the holder of a Chinese green card, was in China advising the government, participating in conferences, and lecturing at universities. The "father of the euro", Mundell visualized an Rmb peg to the dollar as an element in a grander scheme to achieve a world currency (Mundell, 2003). The route would involve dollarizing Hong and fixing both the Rmb and the yen to the dollar, which would then set the stage for an ASEAN+3 currency union.

Short of that, pegging to the dollar was still in China's best interest according to Mundell (Xinhua News Agency, 2005). To float or revalue the Rmb would delay convertibility, inhibit foreign direct investment, slow economic growth, and destabilize Southeast Asia. Moreover, it would not result in the narrowing of the US trade deficit that American opponents of a peg were seeking.

Though he favored a peg, Mundell did not agree with China's large-scale sterilization effort (Restall, 2007). Not only would ceasing this sterilization not result in inflation, in his view, it would lead to reduction of China's external and internal imbalances thus diminishing the need for continued forex market intervention. His reasoning is that the money supply increase from the PBoC's unsterilized forex purchases would go toward satisfying household demand for money balances. Further, once this demand was met, households would increase consumption spending thereby narrowing the saving-invesment gap and hence the export-import gap. Over time, China could then relax controls on capital outflows to further ease any upward pressure on the Rmb, although proceeding too quickly in allowing capital outflows could cause the Rmb to depreciate, so the process should be gradual.

Like Mundell, McKinnon stood in support of a peg. His position was informed by Japan's experience (McKinnon, 2006). With the yen fixed to the dollar through the 1950s and '60s, rapid labor productivity growth in tradable manufactures was transmitted into wage increases against output prices set by global markets. The spread of rising wages to nontradables, where productivity growth was lower, pushed output prices up in that sector in accordance with the Balassa-Samuelson effect. With macroeconomic adjustment to productivity shocks taking place through domestic wages and prices, purchasing power parity was preserved at the given exchange rate while the peg provided a monetary anchor to keep inflation low. China followed this model from 1994 to 2004, benefiting as inflation dropped from 24 percent to the low single digits. Note that for this strategy to work, it is imperative that employers not face uncertainty surrounding currency appreciation because if they do, they will refrain from increasing wages under doubt about export prospects, and without wage increases consumption will not rise to maintain internal and external balance.

Moving into the 1980s, Japan's bilateral trade surpluses with the US provoked American pressure for yen appreciation, to which Japan acquiesced (McKinnon and Schnabl, 2014). This indeed crimped Japan's exports but also slowed its GDP growth which consequently reduced imports relative to exports to result in an actual widening of the trade surplus. To stimulate the economy, Japan adopted expansionary monetary and fiscal policies, and although this did reduce the trade surplus somewhat, it also gave rise to bubbles in the stock and real estate markets. The bubbles eventually burst and the economy then became mired in a deep malaise. All the while, the trade surplus persisted. The lesson is that not only does currency appreciation not eliminate a

trade surplus rooted in an underlying saving-investment imbalance, it tends to generate macroeconomic instability.

In China's case, the saving surplus found its way to capital outflows mainly through central bank reserve accumulation. Were the PBoC to stop its intervention, according to McKinnon and Schnabl (2014: 15), "the RMB would float upward indefinitely with no well-defined equilibrium for the yuan/dollar exchange rate." This is because as an immature creditor nation, China cannot lend in its own currency. Financial institutions and business enterprises are deterred from acquiring foreign currency assets due to the risks of currency mismatch given their liabilities are denominated in Rmb. This leaves the central bank obliged to bear the risk of holding foreign assets. Further, with the Rmb appreciating and the US pursuing a low interest rate policy in the wake of the 2008 financial crisis, China was compelled to prolong its financial repression in order to deter capital inflows. Low interest paid on bank deposits slowed the growth of household income and consumption. Uncertainty surrounding Rmb appreciation inihibited employers from raising wages to similar effect. Thus, repegging the exchange rate would have facilitated financial liberalization as well as a rebalancing of the economy under McKinnon's reasoning.

The controversy over Rmb valuation was effectively resolved by 2014 when China's current account balance dropped to around 2 percent of GDP and net capital flows turned outward in anticipation of depreciation. But antagonisms over exchange rate stabilization have nevertheless continued, taking on a new twist over the malleability and nontransparency of China's methods.

Unconventional Forex Management

China's official reserves have long more than met standard adequacy criteria. To further build up reserves on the back of balance of payments surpluses would come at low returns in the conservative assets appropriate for a central bank. Alternatively, the funds could be mobilized through government channels to greater advantage, financially or geopolitically, and that is what has been done. The result is an opaque system of foreign exchange management through the state financial apparatus.

The offloading of foreign reserves from the SAFE balance sheet began with the formation in 2007 of China Investment Corporation (CIC) as a sovereign wealth fund (Liu, 2023). A precursor in the strategic mobilization of foreign reserves involved the establishment in 2003 of Central Huijin as a subsidiary of SAFE for the purpose of bailing out the big state banks. SAFE transferred foreign reserves to Huijin which then used the funds to take equity positions in the banks providing them with foreign currency assets to strengthen their balance sheets. CIC differed from Huijin in being constituted as an independent entity, and as such it then acquired Huijin from the PBoC. To provide the seed capital, the Ministry of Finance issued bonds in Rmb which were bought by the PBoC (via Agriculture Bank), then used the Rmb proceeds to purchase $200 billion in foreign exchange from the PBoC for injection into CIC. Purchase of Huijin gave CIC a domestic arm through which it has exercised controlling shareholder rights over the financial system. Its international reach has evolved over time in support of China's interests in such areas as securing natural resources, supporting the Belt and Road Initiative, and facilitating the global expansion of state enterprises.

Beyond this, SAFE has channeled reserves into the policy banks (China Development Bank and Export-Import Bank of China), a number of specialized sovereign wealth funds, and the big state commercial banks. Initially SAFE involvement with the policy banks took the form of entrusted loans whereby the policy banks acted as intermediaries between SAFE and foreign borrowers. Later on, the loans were to some extent converted into equity shares (Setser, 2023). Sovereign wealth funds that SAFE has taken a majority stake in include the globally oriented Silk Road Fund and regionally focused funds for Africa and Latin America (SAFE, 2020: 65). According to Caixin Global reporting (Peng, et al., 2019), these funds are aimed at implementing government strategy and serving Chinese companies operating abroad. Finally, SAFE has shifted forex to commercial banks through swaps, selling USD for Rmb with an agreement to repurchase in the future.

Foreign exchange diverted by SAFE to other entities no longer serves as reserves or plays any further role in exchange rate management. By diversifying into such investments, SAFE has extended its scope beyond the core mission of a central bank to maintain safe and liquid foreign currency reserves for purposes of stabilizing the exchange rate.

More unconventionally still, SAFE has seemingly shifted much of the responsibility for exchange rate stabilization to commercial banks and state-owned enterprises. News organizations have reported on this entry of commercial banks into exchange rate management (The Economist, 2020; Reuters, 2024). More formally, Setser (2023) has documented the empirical evidence: (i) both central bank reserves and the exchange rate have remained implausibly stable over a period of years; (ii) net foreign assets of commercial banks have risen dramatically since 2015 with the increase particularly steep during 2020-21 when the Rmb was under pressure to appreciate, but have also declined at intervals when the Rmb was under pressure to depreciate, mimicking the conventional behavior of a central bank; (iii) these net foreign assets have been funded by domestic foreign currency deposits (presumably of state-owned enterprises) that move contrary to financial incentives – rising when USD interest rates are lower than Rmb interest rates putting pressure on the Rmb to appreciate and falling when USD interest rates are higher than Rmb interest rates putting pressure on the Rmb to depreciate. Thus, enterprises and the commercial banks that hold their deposits have been acting in concert to lean against exchange rate movement in either direction.

All told, “hidden reserves” held by China’s state institutions are by Setser’s estimation on par with the country’s official reserves, which puts them in the neighborhood of $3 trillion. This renders meaningless official data on reserves and foreign exchange market intervention as inferred from the balance of payments. This is a problem, in Setser’s view, because it obscures the risks to global finance, especially given China’s exposure to, and leverage in, precarious parts of the world. Prasad (2024) has similarly argued that the opacity of PBoC policy is a problem for the world at large, as well as for China itself. Lack of transparency and cryptic communication undermine confidence in the PBoC and in the prospects of the Rmb as a global currency.

III. Making Sense of It

China was undervaluing its currency, or it was not. China should free up its exchange rate, or it should adopt a hard peg. China has been engaging in currency manipulation, yet the IMF has never declared it a currency manipulator. China is hiding its reserves and forex market intervention and is not being transparent about its policies, so on the outside it's anybody's guess what's happening within. How to make sense of it all? Let us try.

First we pull back to reflect on how the conceptual framework that economists use to interpret exchange rate policy has evolved over time and how East Asia has forged a policy model of its own. We then view China's behavior within the context of that model. While China is broadly a fit for the East Asian model, its size and economic system distinguish it from the rest of the region and we go on to contemplate the ramifications.

Conceptualizing Exchange Rate Policy

A pair of papers published in the early 2000s (Calvo and Reinhart, 2002; Reinhart and Rogoff, 2004) upended the way economists think about exchange rate policy. The conventional wisdom at the time had it that exchange rate arrangements tended toward the corner solutions of free float or hard peg. The work by Reinhart and co-authors showed that instead countries were often claiming to have freely floating exchange rates when in fact they did not and more generally, that IMF classification of exchange rate arrangements by country was little better than random in representing what was actually going on.

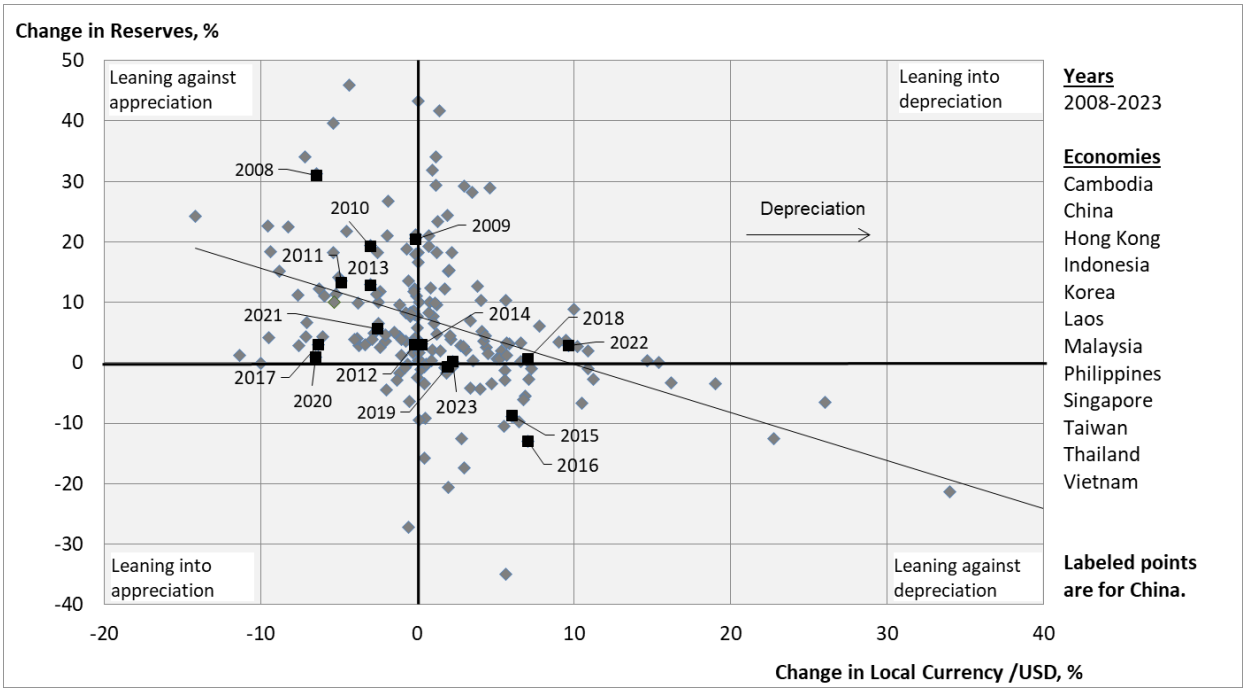
Taking stock, the IMF set about to improve its methods. In 1999 it stopped taking countries' self-proclaimed exchange rate arrangements at face value and began making its own assessments of de facto policy. In 2009, it arrived at a classification system, retained to the present, that replaced a 1998 revision which followed a series of previous revisions dating back to the demise of Bretton Woods in 1971 (Habermeier et al., 2009). The 2009 system was intended to capture more nuance in differentiating managed exchange rate regimes.

For China, the 1999 shift in IMF methodology from self-reporting to de facto assessment brought a reclassification from "other managed floating" to "conventional peg". This classification held until August 2006 when China's July 2005 break with its peg was reflected in a reclassification to "crawling peg". Then with the new classification system of 2009, China was placed under "crawl-like arrangement", retroactive to April 2008. From there, reclassification continued apace: June 2008, stabilized; June 2010, crawl-like; December 2014, other managed; November 2015, crawl-like; August 2016, stabilized; November 2016, crawl-like; ?, stabilized; June 2017, crawl-like; June 2018, other managed; July 2020, crawl-like; March 2022, other managed (International Monetary Fund, 2024; International Monetary Fund, various years A).

Twelve reclassifications in 16 years gives the appearance of rather erratic policymaking on China's part. A more careful analysis, however, suggests an overarching policy framework that involves responsiveness to circumstances, trading off flexibility and stability as called for. China fits a pattern in this regard that is broadly typical of the Emerging East Asia region. The analytical apparatus is developed in my textbook, *Macroeconomics for Emerging East Asia* (Wiemer, 2022). The essence of the East Asian approach to exchange rate management is "to lean against the

wind", as captured in Figure 5. Depreciation against the USD is measured rightward along the horizontal axis and reserve accumulation (as reflected in the balance of payments) relative to the stock of reserves on the vertical axis. The upper quadrants capture reserve acquisition, leaning into depreciation on the right and against appreciation on the left. Conversely, the lower quadrants capture reserve drawdown, leaning against depreciation on the right and into appreciation on the left.

Figure 5. Leaning against the Wind: Forex Market Intervention vs Exchange Rate Movement in Emerging East Asia



Data source: Reserve changes based on balance of payments flows, reserve stocks, and exchange rates from IMF International Financial Statistics.

The scatterplot represents the forex market intervention of 12 economies for the years 2008-2023. The relationship between forex market intervention and local currency depreciation is broadly negative meaning that central banks tend to lean against both appreciation and depreciation. To a moderate extent, they lean into depreciation as well, but rarely and only minusculely do they ever lean into appreciation. Most of the sample points lie above the horizontal axis implying that reserve building is the norm. This represents a precautionary stance taken when a currency is appreciating or only slightly depreciating so as to be prepared to defend the currency by selling reserves should it come under heavy downward pressure. It is further precautionary in guarding against overvaluation that might induce capital flight were expectations of depreciation to arise.

East Asia has honed this model well. A comparison with Latin America finds data points for that region dispersed randomly across the graphical space with no discernible association between foreign exchange market intervention and exchange rate movement (Wiemer and Meurer,

2021). East Asia's superior performance with respect to macroeconomic stability and sustained growth arguably rests on a foundation of sound exchange rate management.

China's Policy in Regional Context

China's exchange rate policy fits well within the scatterplot of Figure 5, as depicted by black squares with yearly labels. For the most part between 2008 and 2023, the PBoC acquired reserves, the more so when the Rmb was under pressure of appreciation. In 2015 and 2016, the PBoC defended the Rmb against downward pressure by selling off reserves to a cumulative degree of more than 20 percent. Since 2017, Figure 5 shows the Rmb fluctuating with little to no central bank intervention. Then-governor of the PBoC Yi Gang, in a presentation at the Peterson Institute in 2023, explained that, indeed, the "PBoC has by and large exited from regular intervention." (Yi, 2023: 18) True though that may be, other state institutions may have taken up the mantle if Setser (2023) and news reports are to be believed. Setser's investigation suggests that through tentacles reaching into the broader financial system, the authorities are still leaning against the wind in exchange rate management, though not transparently so. Nevertheless, annual fluctuations have become notably greater since 2017 as the PBoC has receded from visible intervention.

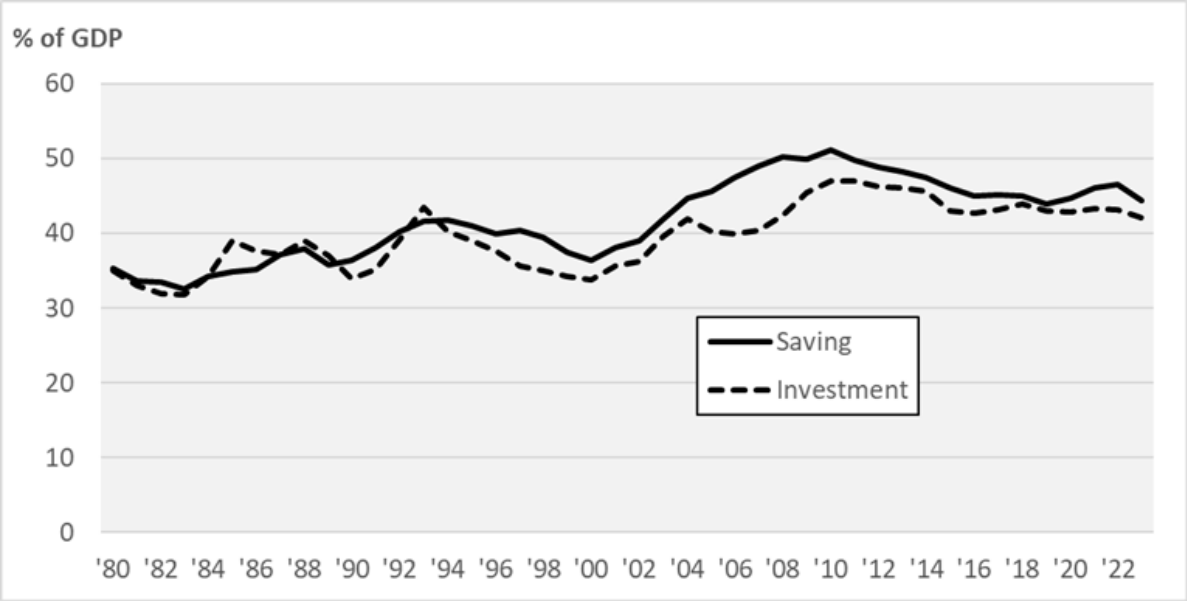
As China was not an outlier in the rate at which it accumulated reserves against currency appreciation, so it was not an outlier in the cumulative magnitude of reserve accumulation (Wiemer, 2022). Figure 3 shows China's reserve-to-GDP ratio peaking at 40 percent, which falls short of some of its regional neighbors (Singapore, Taiwan, Cambodia, Thailand at their 2022 levels). China's ratio by the 2020s of around 20 percent is low by the standards of the region (exceeded additionally by the Philippines, Korea, Vietnam, Malaysia). The expending of three-quarters of a trillion dollars to push back against capital flight in 2015-2016 makes a $3-4 trillion trove seem merely adequate to ensure a credible defense of a currency under duress.

The textbook framing of Figure 5 treats the exchange rate as an instrument of monetary policy to be managed in pursuit of internal and external balance (Wiemer, 2022). Imbalances come about from a constant barrage of exogenous shocks and cyclical forces, where the resulting internal and external consequences must at times be weighed against each other. The China case can be interpreted on these terms: insufficient aggregate demand domestically was met with the PBoC leaning against currency appreciation to maintain growth at potential by favoring net exports to take up the slack.

For all of their opposing exchange rate advice, none of the commentators referenced in Part II saw cause and effect running in this way from the saving-investment imbalance to an exchange rate policy response. Rather, all argued that causality ran from exchange rate policy to the saving-investment imbalance. Goldstein and Lardy (2007) maintained that Rmb undervaluation and sterilization of PBoC forex purchases necessitated financial repression that deprived households of interest income that would have favored consumption versus saving. Mundell also faulted sterilization, but his reasoning lay in the unmet demand for money balances inhibiting household consumption. For McKinnon (2006) the problem lay with PBoC failure to commit to a peg and the resulting employer uncertainty about export potential preventing wage increases that would have supported consumption. In all cases then, altering exchange rate policy – either by floating or fixing or just ceasing to sterilize – would ostensibly have made China's macro imbalances go away.

One might be skeptical in that none of these theories is rooted in an examination of the historical emergence of the imbalances. Figure 6 presents China's national saving and domestic investment rates from 1980 to 2023. The saving rate is seen to have risen sharply during the 2000-aughts from 36.4 percent in 2000 to 51.1 percent in 2010. Initially the investment rate tracked with it, but then stabilized to resume rising only later. To understand the explosive growth in China's trade surplus then, the run-up in the saving rate merits attention. In fact, China again fits a regional pattern. Taiwan, Singapore, Korea, Thailand, Malaysia, Vietnam – all experienced similar increases in saving rates during their periods of rapid economic growth and demographic transition (Wiemer, 2020). For the China case, Bonham and Wiemer (2012) estimated a relationship for saving as a function of GDP growth and the dependent share in population, and found that these factors explain very well the movement in the saving rate.

Figure 6. Saving and Investment Rates, 1980-2023



Data source: World Bank, World Development Indicators.

China differs from other countries in that its saving rate was much higher at the start of its growth takeoff under the legacy of Maoist economic planning. Sustaining productive investment at a rate approaching 50 percent of GDP would be challenging under any circumstances. For the saving-investment gap to be mitigated then, the saving rate would need to come down. A theory of saving based on GDP growth and the dependent share in population portended such a decline in the projections of Bonham and Wiemer, and this indeed is what actually transpired. From the peak of 51.1 percent of GDP in 2010, the saving rate edged downward to 44.0 percent in 2019, converging toward an investment rate of 43.3 percent for a trade surplus of just 0.7 percent.

This felicitous trend was disrupted in 2020 by the Covid shock and the bursting of China's property bubble. Initially China fared well under Covid, containing disease transmission and exploiting opportunities in manufactured exports to offset a falloff in domestic consumption due to lockdowns. The Rmb appreciated in 2020 and 2021 under export demand pressure, then dropped back in 2022. More enduringly, the blow to the property sector has taken a toll on confidence to the

detriment of consumer spending. The saving rate has ticked up again, but this is presumably cyclical in nature with structural factors pulling it down again longer term.

While a declining saving rate will tend to ease imbalances on trend, disruption from cyclical forces and exogenous shocks is ongoing. For Emerging East Asia, forex market intervention has proven a valuable instrument of stabilization against such forces. China is no exception in this regard.

On Exceptionalism

Critics of China's exchange rate policy have objected to the use of forex market intervention for economic stimulus purposes. From Mussa (2008: 293) of the Peterson Institute: "The assertion by Chinese officials that China is using its exchange rate and related policies for the purpose of stimulating employment is a confession of guilt to violation of Article IV Section 1(iii)." The text of the IMF article referenced is stated at the beginning of Part II of this paper and prohibits exchange rate manipulation aimed at preventing balance of payments adjustment or gaining an unfair competitive advantage. The article does not prohibit use of the exchange rate as an instrument of stabilization policy, which characteristically takes employment as a key indicator. Indeed, use of the exchange rate for stabilization is the norm in Emerging East Asia as there is little space for independent manipulation of interest rates.

The power over interest rates lies with the US. That the US may manipulate interest rates "for the purpose of stimulating employment" is not "a confession of guilt" or at all subject to challenge despite the impact it has on the USD exchange rate vis-à-vis currencies the world over. The US is the exceptional nation in this regard. It acts on interest rates and the rest of the world must react. For emerging market economies reaction includes leaning against exchange rate movement as the US generates waves in global trade and capital flows. More generally, the exchange rate becomes an instrument of stabilization policy for emerging market economies against cyclical forces and shocks of all sorts as the US maintains sway over interest rates.

China is not exceptional in its reliance on exchange rate management for macroeconomic policy. It is, however, exceptional for its size and for the institutional context in which its policy is shaped, and that is why its behavior attracts so much attention. In recent years the criticism has shifted from the magnitude of trade imbalances to the clandestine nature of forex market intervention and reserve redirection. During this time China's economic system under Party Secretary Xi Jinping has evolved in ways that empower the country's global reach. Naughton and Boland (2023) have adopted the term "CCP Inc" to capture the way the Chinese Communist Party has extended its tentacles through government and the economy to marshall efforts toward achieving Xi's goal of national greatness. The goal itself need not be threatening to the US-led coalition, but the institutional constructs the endeavor rests on are certainly concerning.

At stake are both the principles that support economic efficiency and the values that undergird world order. Foundational to the efficient functioning of a global market economy are the principles of competition and profitability. China's engagement in world markets is not constrained by these principles. As Naughton and Boland (2023: 2) explain, CCP Inc. is "an intentionally designed hierarchical structure that facilitates coordinated action." Within this structure "the fundamental nature of firm-authority relations has transformed." (p. 9) Chinese entities collude up,

down, and across the value chain while its financial apparatus steers resources in support of the state's industrial and geopolitical objectives. That enterprises and commercial banks work with the PBoC to implement exchange rate policy within this system is integral to its very fabric.

The economic system is embedded within a legal system that has also been transformed under Xi Jinping. The new "Party-State Socialist Rule of Law", in Peerenboom's (2024) terminology, elevates the role of the Party and concentrates power at the top. The relevance of "Party-state" and "socialism" may be understood under a "thick" conception of the rule of law that subsumes norms, institutions, and moral principles that bear on how a legal system is realized. Under a liberal democratic system, the rule of law in its thick conception embodies principles of human rights, government transparency, and limitations on state power. By contrast, Party-state socialism internalizes principles of social order and nation building into the rule of law. Within the Party-state socialist system there is no presumption that the central bank or any government authority be open about its actions or held to public accountability, and indeed openness and the subjecting of authority to question are at odds with how the system works and the objectives it has been designed to serve.

Both the US and China are exceptional nations. Principles that govern the conduct of macroeconomic policy in the US or lessons learned from US experience do not transmit well to other environments, least of all to China's. In particular, admonitions that the PBoC be more transparent in articulating its actions and intentions are not likely to land if the vision is of the governor holding press conferences and engaging in back and forth with journalists. That does not mean communication about exchange rate policy is not seen as important by the PBoC, and indeed since the precipitous Rmb depreciation of 2015-16 attention to the need for communication has become a staple of PBoC Monetary Policy Reports. That foreign observers are not privy to such communication does not mean the PBoC is failing to adhere to its own prescriptions. Rather, it just differs in its channels and methods.

IV. Conclusion

China has borne criticism of its exchange rate policy for decades, most stridently for purported "currency manipulation", but also, and from eminent economists, for the opposite of breaking with a hard peg to the US dollar. Against all the noise, China charted a course from its command economy origins to a model that is the norm for the Emerging East Asia region. This model involves leaning against excessive exchange rate movement in either direction to track a market-oriented path over the medium term. In China's case, pressure for Rmb appreciation derived from a fast rising saving rate that resulted from phenomenol GDP growth and a pronounced demographic window. The excess of saving over investment diverted output to exports that exceeded imports with the twin gaps, and the GDP growth rate, sustained by the central bank leaning against Rmb appreciation. In the unfolding of time as growth slows and the population ages, the saving rate has been tracking downward to take the pressure off the currency. Disruptive forces of other sorts remain ever at play, however, and for China along with most of the world's economies the exchange rate serves as a vital instrument for countering them.

More recently, the criticism has shifted to forex market intervention taking place off the central bank balance sheet and the central bank not being transparent about its actions. This reflects a tendency for American economists to proselytize about a US macro policy model despite the US being unique in printing the world's reserve currency and holding sway over global interest rates. Other countries are put in a position of having to respond and must find their own ways of doing so. China is exceptional in its own right, and has in fact seen a strengthening in that direction in terms of Communist Party economic power and international reach. That the PBoC intermediates the flow of foreign exchange and holds assets beyond official reserves under this system is in the nature of the beast. So, too, is the co-opting of commercial banks to aid in stabilizing exchange rate fluctuations. When this becomes troubling is when capital is mobilized globally in ways that increase risk and aggravate geopolitical tensions. But this problem lies beyond the realm of exchange rate policy. So while there are things to be concerned about with respect to China's activity in the global arena, its exchange rate policy does not rank among them.

References

Arslanalp, S., B. Eichengreen, and C. Simpson-Bell, 2022. Dollar Dominance and the Rise of Nontraditional Reserve Currencies, IMF Blog. https://www.imf.org/en/Blogs/Articles/2022/06/01/blog-dollar-dominance-and-the-rise-of-nontraditional-reserve-currencies (accessed 2 September 2024).

Bank for International Settlements, 2022. Triennial Central Bank Survey, BIS. https://www.bis.org/statistics/rpfx22_fx.pdf (accessed 2 September 2024).

Bank of China, n.d. Establishment of State Administration of Foreign Exchange as System Reform of Bank of China (1979-1980). https://www.boc.cn/en/aboutboc/ab7/200809/t20080926_1601851.html (accessed 15 August 2024).

Bergsten, C.F., 2010a (24 March). Correcting the Chinese Exchange Rate: An Action Plan, Testimony before the Committee on Ways and Means, US House of Representatives. https://democrats-waysandmeans.house.gov/sites/evo-subsites/democrats-waysandmeans.house.gov/files/media/pdf/111/10-03-24_Bergsten_Testimony.pdf (accessed 6 September 2024).

Bergsten, C.F., 2010b (15 September). Correcting the Chinese Exchange Rate, Testimony before the Committee on Ways and Means, US House of Representatives. https://www.piie.com/commentary/testimonies/correcting-chinese-exchange-rate (accessed 6 September 2024).

Bonham, C. and C. Wiemer, 2012. Chinese Saving Dynamics: The Impact of GDP Growth and the Dependent Share, Oxford Economic Papers, 65(1): 173-196.

Calvo, G.A. and C.M. Reinhart, 2002. Fear of Floating, *Quarterly Journal of Economics*, CXVII(2): 379-408.

Cheung, Y.-W., M. Chinn, and E. Fujii, 2007. The Overvaluation of Renminbi Undervaluation, Working Paper 12850, National Bureau of Economic Research. https://www.nber.org/system/files/working_papers/w12850/w12850.pdf (accessed 8 September 2024).

CFETS Guest Commentator, 2016. The RMB Officially Joining the SDR Currency Basket Contributes to RMB Exchange Rate Stability, People's Bank of China. http://www.pbc.gov.cn/english/130721/3152748/index.html (accessed 2 September 2024).

China Investment Corporation, 2022. Annual Report 2022. https://www.china-inv.cn/chinainven/xhtml/Media/2022EN.pdf (accessed 20 September, 2024).

Chodosh, H.E., 1991. Swap Centers in the People's Republic of China: A Step Toward Partial Convertibility of Local Currency, International Lawyer, 25(1):415-442.

Clarke, C.M., 1984. China's Reform Program, *Current History*, 83(494):254-256,273.

Dai, D., 2016. The Interaction between CFETS RMB Index and USDCNY, Economic Review, Bank of China (Hong Kong) Limited. https://www.bochk.com/dam/investment/bocecon/SY2016007(en).pdf (accessed 30 August 2024).

Das, S., 2019. China's Evolving Exchange Rate Regime, IMF Working Papers. https://www.imf.org/en/Publications/WP/Issues/2019/03/07/Chinas-Evolving-Exchange-Rate-Regime-46649 (accessed 28 June 2024).

Eichengreen, B., 2004. Chinese Currency Controversies, Centre for Economic Policy Research. https://repec.cepr.org/repec/cpr/ceprdp/DP4375.pdf (accessed 4 September 2024).

Goldstein, M., 2003. China's Exchange Rate Regime, Peterson Institute for International Economics (Testimony before the Subcommittee on Domestic and International Monetary Policy , Trade, and Technology Committee on Financial Services, US House of Representatives). https://www.piie.com/commentary/testimonies/chinas-exchange-rate-regime (accessed 5 September 2024).

Goldstein, M., 2007. Assessing Progress on China's Exchange Rate Policies, Testimony before the Committee on Finance, US Senate, Peterson Institute. https://www.piie.com/commentary/testimonies/assessing-progress-chinas-exchange-rate-policies (accessed 6 September 2024).

Goldstein, M. and N. Lardy, 2006. China's Exchange Rate Policy Dilemma, *American Economic Review*, 96(2):422-426.

Goldstein, M. and N. Lardy, 2007. China's Exchange Rate Policy: An Overview of Some Key Issues, Peterson Institute for International Economics. https://www.piie.com/commentary/speeches-papers/chinas-exchange-rate-policy-overview-some-key-issues (accessed 30 September 2024).

Habermeier, K., A. Kokenyne, R. Veyrune, and H. Anderson, 2009. Revised System for the Classification of Exchange Rate Arrangements, International Monetary Fund. https://www.imf.org/external/pubs/ft/wp/2009/wp09211.pdf (accessed 25 September 2024).

Hu, Xiaolian, 2010. A Managed Floating Exchange Rate Regime Is an Established Policy, People's Bank of China. http://www.pbc.gov.cn/english/130724/2881712/index.html (accessed 21 August 2024).

International Monetary Fund, various years A. Annual Report on Exchange Arrangements and Exchange Restrictions. https://www.elibrary.imf.org/subject/012?pageSize=10&sort=datedescending&type_0=book&type_1=pubgen_post&type_2=journalissue (accessed 25 September 2024).

International Monetary Fund, various years B. Article IV Consultation Staff Report.

International Monetary Fund, 2024. AREAER Online. https://www.elibrary-areaer.imf.org/Pages/ChapterQuery.aspx (accessed 24 September 2024).

International Monetary Fund, 2024. International Financial Statistics database. https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b&sid=1390030341854 (accessed 30 September 2024).

International Monetary Fund, 2003. Public Information Notice: IMF Concludes 2003 Article IV Consultation with the People's Republic of China. https://www.imf.org/en/News/Articles/2015/09/28/04/53/pn03136 (accessed 4 September 2024).

International Monetary Fund, 2015. 2015 External Sector Report – Individual Economy Assessments. https://www.imf.org/external/np/pp/eng/2015/062615.pdf (accessed 10 September 2024).

International Monetary Fund, 2024. Currency Composition of Official Foreign Exchange Reserves (COFER), IMF. https://data.imf.org/?sk=e6a5f467-c14b-4aa8-9f6d-5a09ec4e62a4 (accessed 2 September 2024).

International Monetary Fund, 2024. International Financial Statistics database. http://data.imf.org/?sk=5DABAFF2-C5AD-4D27-A175-1253419C02D1&sId=1390030341854&ss=1390030341854 (accessed 20 August 2024.

Jermann, U.J., B. Wei, and V.Z. Yue, 2021. The Two-Pillar Policy for the RMB, Wharton Finance. https://finance.wharton.upenn.edu/~jermann/JF_text.pdf (accessed 30 August 2024).

Kessler, M. and A. Subramanian, 2014. Is the Renminbi Still Undervalued? Not According to New PPP Estimates, Peterson Institute for International Economics. https://www.piie.com/blogs/realtime-economic-issues-watch/renminbi-still-undervalued-not-according-new-ppp-estimates (accessed 10 September 2024).

Lin, G. & R.M. Schramm, 2003. China's Foreign Exchange Policies Since 1979: A Review of Developments and an Assessment, *China Economic Review*, 14(3): 246-280.

Liu, Z.Z., 2023. *Sovereign Funds: How the Communist Party of China Finances Its Global Ambitions* (Cambridge, MA: The Belknap Press of Harvard University Press).

Long, C., 2017. Containing Capital Outflows, GavekalDragonomics.

Ma, G., X. Yan, and X. Liu, 2011. China's Evolving Reserve Requirements, BIS Working Papers No. 360. https://www.bis.org/publ/work360.pdf (accessed 26 August 2024).

McKinnon, R., 2006. China's Exchange Rate Trap: Japan Redux? *American Economic Review*, 96(2): 427-431.

McKinnon, R. and G. Schnabl, 2014. China's Exchange Rate and Financial Repression: The Conflicted Emergence of the RMB As an International Currency, *China & the World Economy*, 22(3): 1-35.

Mehran, H., M. Quintyn, T. Nordman, & B. Laurens, 1996. Monetary and Exchange System Reforms in China: An Experiment in Gradualism, IMF eLibrary. https://www.elibrary.imf.org/display/book/9781557755629/9781557755629.xml

Mundell, R., 2003. Prospects for an Asian Currency Area, *Journal of Asian Economics*, 14: 1-10.

Pan, G., 2019. China's Foreign Exchange Administration Reform over the Past Seven Decades, SAFE News, State Administration of Foreign Exchange. https://www.safe.gov.cn/en/2019/0930/1574.html (accessed 8 July 2024).

Mussa, M., 2008. IMF Surveillance over China's Exchange Rate Policy, in M. Goldstein and N.R. Lardy (eds.), *Debating China's Exchange Rate Policy* (Washington DC: Peterson Institute for International Economics). https://www.piie.com/publications/chapters_preview/4150/08iie4150.pdf (accessed 6 October 2024).

Naughton, B. and B. Boland, 2023. CCP Inc.: The Reshaping of China's State Capitalist System, Center for Strategic & International Studies. https://www.csis.org/analysis/ccp-inc-reshaping-chinas-state-capitalist-system (accessed 6 October 2024).

Peerenboom, R., 2024. The Transformation of State Socialist Rule of Law into Party-State Socialist Rule of Law in the Xi Jinping Era of Comprehensive Rules-Based Governance, *Hague Journal on the Rule of Law*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4736955 (accessed 10 October 2024).

Peng, Q., F. Wang, and G. Wu, 2019. Exclusive: China to Combine Africa, Latin America Investment Funds, Caixin Global, 19 February. https://www.caixinglobal.com/2019-02-19/exclusive-china-to-combine-africa-latin-america-investment-funds-101381418.html (accessed 21 September 2024).

People's Bank of China, various years, 2022-2024. *China Monetary Policy Report* (quarterly). http://www.pbc.gov.cn/en/3688229/3688353/3688356/index.html

People's Bank of China, n.d. China: The Evolution of Foreign Exchange Controls and the Consequences of Capital Flows, BIS website. https://www.bis.org/publ/bppdf/bispap44h.pdf (accessed August 21, 2024).

Perez-Saiz, H. and L. Zhang, 2023. Renminbi Usage in Cross-Border Payments: Regional Patterns and the Role of Swaps Lines and Offshore Clearing Banks, IMF Working Papers. https://www.imf.org/en/Publications/WP/Issues/2023/03/31/Renminbi-Usage-in-Cross-Border-Payments-Regional-Patterns-and-the-Role-of-Swaps-Lines-and-531684

Peterson Institute for International Economics, 2024. Testimony, China. https://www.piie.com/search?search_api_fulltext=testimony&f%5B0%5D=topics_and_regions%3A181&page=0 (accessed 5 September 2024).

Prasad, E., 2017. *Gaining Currency: The Rise of the Renminbi*, Oxford University Press (Kindle version).

Prasad, E., 2024. The People's Bank of China Has a Transparency Problem, *Financial Times*, 26 August. https://www.ft.com/content/33abc69f-61de-4cae-8da2-3a4646d08bfb (accessed 7 September 2024).

Reinhart, C.M. and K.S. Rogoff, 2004. The Modern History of Exchange Rate Arrangements: A Reinterpretation, *Quarterly Journal of Economics*, CXIX(1): 1-48.

Restall, H., 2007. Robert Mundell and the Yuan Riddle, Wall Street Journal. https://www.wsj.com/articles/SB118134724082429687 (accessed 12 September 2024).

Reuters, 2024. How China Talked Markets Out of a Run on the Yuan, Reuters, 1 January. https://www.reuters.com/markets/currencies/how-china-talked-markets-out-run-yuan-2023-12-30/ (accessed 7 September 2024).

Salidjanova, N., 2015. China's Stock Market Collapse and Government's Response, Issue Brief, U.S.-China Economic and Security Review Commission. https://www.uscc.gov/sites/default/files/Research/China%E2%80%99s%20Stock%20Market%20Collapse%20and%20Government%E2%80%99s%20Response.pdf (accessed 8 August 2024).

Schneider, H., 2010. China Allows IMF to Share Results of Economic Report, Washington Post, 30 July. https://www.washingtonpost.com/wp-dyn/content/article/2010/07/29/AR2010072906007.html (accessed 6 September 2024).

Setser, B., 2023. How to Hide Your Foreign Exchange Reserves – A User's Guide, Council on Foreign Relations. https://www.cfr.org/blog/how-hide-your-foreign-exchange-reserves-users-guide (accessed 21 September 2024).

State Administration of Foreign Exchange, 2020. Annual Report 2020. https://www.safe.gov.cn/en/file/file/20211217/1bdd3ed85dba4d269655b5ce7159893b.pdf?n=Annual%20Report%20of%20the%20State%20Administration%20of%20Foreign%20Exchange%20(2020) (accessed 21 September 2024).

State Administration of Foreign Exchange, n.d. Renminbi Exchange Rate Central Parity database. [In Chinese.] https://www.safe.gov.cn/safe/rmbhlzjj/index.html

The Economist, 2020. If China's Economy Is So Strong, Why Isn't Its Currency Stronger, 31 October 2020. https://www.economist.com/finance-and-economics/2020/10/31/if-chinas-economy-is-so-strong-why-isnt-its-currency-stronger? (accessed 22 September 2024).

von Beschwitz, B., 2024. Internationalization of the Chinese Renminbi: Progress and Outlook, Board of Governors of the Federal Reserve System. https://www.federalreserve.gov/econres/notes/feds-notes/internationalization-of-the-chinese-renminbi-progress-and-outlook-20240830.html (accessed 2 September 2024).

Wang, G. and N. Lin, 2020. 70 Years of China's Foreign Exchange Market Development: History and Experience, *China Political Economy*, 3(1): 3-17. https://www.emerald.com/insight/content/doi/10.1108/CPE-05-2020-0007/full/html

Wiemer, C., 2020. The Real Reason for China's Unbalanced Growth (Orlik Review Addendum), Asia Economics Blog. https://acaes.us/asia-economics-blog/reason-for-china-s-unbalanced-growth (accessed 27 September 2024).

Wiemer, C., 2022. *Macroeconomics for Emerging East Asia* (Cambridge, UK: Cambridge University Press).

Wiemer, C., and R. Meurer, 2021. The Exchange Rate in East Asia's Macro Stabilization Policy: Contrast with Latin America, Asia Economics Blog, https://acaes.us/asia-economics-blog/exchange-rate-contrast-with-latin-america (accessed 26 September 2024).

World Bank, 2024. World Development Indicators database. https://databank.worldbank.org/source/world-development-indicators (accessed 11 October 2024).

Xinhua News Agency, 2005. Nobel Laureate Urges Keeping Yuan Stable. China.org.cn. http://www.china.org.cn/english/BAT/130603.htm (accessed 12 September 2024).

Yi, G., 2023. China's Monetary Policy: Practice and Rationale, Peterson Institute for International Economics. https://www.youtube.com/watch?v=VrkZP2niZ18 (accessed 27 September 2024).