

Journal of Financial Crises

Volume 4 | Issue 4

2022

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Recommended Citation

Mott, Carey K. (2022) "China: Reserve Requirements, 2015–2016," *Journal of Financial Crises*: Vol. 4 : Iss. 4, 393-428.

Available at: <https://elischolar.library.yale.edu/journal-of-financial-crises/vol4/iss4/19>

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China: Reserve Requirements, 2015–2016¹

Carey K. Mott²

Yale Program on Financial Stability Case Study
December 22, 2022

Abstract

After China devalued the renminbi against the US dollar in August 2015, Chinese equity markets experienced a significant drop that spilled into international markets. The People's Bank of China (PBOC) adjusted the reserve requirement ratio (RRR) five times between February 2015 and October 2015: three times before the market turmoil, to allocate credit to preferred sectors, and twice in response to the crisis to release liquidity into the financial system. Throughout this cycle, the central bank applied lower RRRs to rural credit institutions, agricultural lenders, leasing and financing companies, and other sectors in which government policy promoted lending. Although the central bank once favored the RRR as a cost-effective monetary policy tool, its use had declined in recent years as its purpose changed. The RRR cuts injected a substantial amount of liquidity into the financial system. For illustration, the deposits of financial corporations with the PBOC declined by 2.1 trillion yuan (USD 330 billion) between the end of March and the end of December 2015, from 22.7 trillion to 20.6 trillion yuan; other government policies would have also affected bank reserves during this period. Since 2013, the PBOC had a suite of lending facilities designed to provide market-based liquidity, reducing the need for RRR cuts as a liquidity provisioning tool in 2015. Following the China Scare, the PBOC continued to adjust the RRR to allocate credit to preferred sectors of the economy and, increasingly, to implement macroprudential policy.

Keywords: China, China Scare, liquidity rules, PBOC, reserve requirements, reserve requirement ratio

¹ This case study is part of the Yale Program on Financial Stability (YPFS) selection of New Bagehot Project modules considering the adjustment of reserve requirements. Cases are available from the *Journal of Financial Crises* at <https://elischolar.library.yale.edu/journal-of-financial-crises/>.

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Overview

Between 2015 and 2016, the “China Scare” saw volatility in Chinese equity markets spill over into global financial markets. On three separate occasions, beginning on August 11, 2015, China discretely devalued the renminbi³ against the US dollar by 3.6% (Ahmed et al. 2019; PBOC 2015g; PBOC 2015h). This surprise devaluation became public two weeks later, and on August 24, on the heels of weak economic data, the Shanghai stock index declined by 8.5% in an event dubbed “China’s Black Monday”⁴ (Ahmed et al. 2019). The China Scare resulted in a shock to the real economy that spilled over into other economies.

The PBOC had already adjusted the headline RRR for large financial institutions in February, April, and June 2015. It targeted these cuts to encourage banks to lend to sectors that the government wanted to support, particularly agriculture, leasing, and auto finance.

When the equity market turbulence began that August, the PBOC cut the RRR in August and October to ease liquidity in the financial system. In August, the PBOC cut the RRR by 50 basis points (bps) for all financial institutions (PBOC 2015d). In October, the PBOC cut the RRR by 50 bps for all financial institutions and a further 50 bps for firms with significant agricultural lending (PBOC 2015e).

In the prior decade, the PBOC had relied on reserve requirement policy because of its efficacy in the face of large foreign reserves accumulation, its practical benefits to the PBOC, and its integration into a monetary policy framework that targeted quantities amid sometimes conflicting policy objectives (Ma,

Key Terms

Purpose of Adjusting Reserve Requirement (RR): For credit allocation to preferred sectors in early 2015 and “to maintain adequate liquidity in the banking system” later in 2015 (PBOC 2015d)

Range of RR Ratio (RRR) Range	20%–17.5% (headline rate for large financial institutions)
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RRR Increase Period	Not applicable
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RRR Decrease Period	February 4, 2015–October 24, 2015
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Legal Authority	Law of the People’s Republic of China on the People’s Bank of China
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Interest/Remuneration on Reserves	Required Reserves (local currency): 1.62%
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	Required Reserves (foreign currency): 1.62%
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	Excess Reserves: 0.72%
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Notable Features	To promote liquidity, the PBOC reduced the RRR more for smaller banks and specific sectors
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Outcomes	Bank reserves declined by USD 330 billion over March–December 2015
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³ The PBOC intervened in international currency markets to maintain the value of China’s currency—the renminbi (RMB), which as of 2010 was denominated in units of yuan (CNY for mainland China use or CNH for offshore use)—against a basket of major currencies, which mainly comprised US dollars (Morrison 2009).

⁴ Equity markets declined again by 7% on both January 4 and January 7, 2016 (Ahmed et al. 2019).

Xiandong, and Xi 2013). Yet after substantial use during the Global Financial Crisis (GFC), required reserves fell out of favor among PBOC officials as a tool to manage liquidity in the banking sector.⁵

Since the crisis, the PBOC used RRR adjustments to tighten monetary conditions as a countercyclical measure, often in combination with other policy tools, and has frequently eased the RRR to ease liquidity in the banking system and to fill the liquidity gap caused by the decrease in net purchases of foreign exchange (Ma, Xiandong, and Xi 2013; PBOC 2015m).

As the PBOC implemented various liquidity facilities between 2013 and 2015, and holdings of foreign exchange reserves peaked in 2014, the RRR became less of a liquidity management tool (Jones and Bowman 2019). The PBOC continued to use RRR to allocate credit to preferred sectors, even amid an overall tightening of credit following the 2009–10 stimulus-driven credit boom, which would ultimately lead to the PBOC using RRR as primarily a macroprudential tool to control the nonbank lending that emerged during this era.

As the PBOC tightened traditional forms of bank credit following the GFC, financing shifted to nonbank credit. Between the GFC and 2019, nonfinancial private credit doubled to more than 200% of GDP⁶ (Ahmed et al. 2019; Zheng et al. 2017).⁷ By 2016, credit extended to the real economy that was intermediated by nonbanks stood around 70% of GDP (Dieppe et al. 2018).

Meanwhile, risks were building in China's financial system. While the PBOC reported banks' nonperforming loans (NPL) were only 1.7% of total lending, the figure was likely much higher due to the delayed accounting recognition of NPLs. Economists at the European Central Bank and International Monetary Fund estimated nonperforming loans were closer to 8% or 9% of on-balance sheet lending (Dieppe et al. 2018).

To address the growing risks, the PBOC used RRR policy for macroprudential goals. For example, it imposed higher RRRs on banks that had extended relatively risky loans. Higher RRRs were costly for banks, because the PBOC set remuneration of reserves at 1.62%, well below market rates. As a result, the policy was successful at curtailing lending. At the same time, the PBOC imposed lower RRRs on banks that made agricultural loans, to avoid impoverishing rural areas.

⁵ A brief history of RRR use in China after the GFC and during the Taper Tantrum of 2013 is provided in Appendix C.

⁶ Between 2005 and 2018, China accounted for half of newly created credit globally (Dawson et al., 2017).

⁷ Ahmed et al. (2019) observed that, of the 11 countries that sustained this level of debt as of 2019, almost half experienced a financial crisis within five years of crossing that threshold (Ahmed et al. 2019). China's nonfinancial private credit to GDP level at that time was second only to the United States.

Summary Evaluation

According to the PBOC's 2015 Annual Report, the deposits of financial corporations with the PBOC declined by 2.1 trillion yuan (USD 330 billion)⁸ between the end of March and the end of December 2015, from 22.7 trillion to 20.6 trillion yuan (PBOC 2015i). That would provide a strong indication of the amount of liquidity that the cuts in RRR injected into the financial system during that period, although other government policies would have also affected bank reserves. The PBOC's third-quarter 2015 Monetary Policy Report noted that outstanding base money, which is about three-fourths reserves and one-fourth currency, had dropped 1.4 trillion yuan since the beginning of the year, "mainly due to hefty liquidity released by cuts in the reserve requirement ratio from the start of 2015" (PBOC 2015l, 1).

Ma, Xiandong, and Xi (2013) note that the PBOC applied different reserve requirements to individual firms for many reasons. They say that the PBOC often tweaked RRRs in combination with adjustments to price-based policy tools, such as interest rates, and quantity-based tools, such as "window guidance" policy (see Figure 6 in Appendix A for a summary of the PBOC's policy tools). Thus, it is difficult to isolate the effects of RRR adjustments from other policy actions. For example, a RRR hike did not necessarily imply the PBOC was taking a tighter monetary policy stance; that stance depended also on the magnitude of sterilization and other policy actions by the PBOC and central government. Any contractionary effects of RRR hikes were shaped by interactions among these policy tools. Moreover, Ma et al. find that the channels for RRR adjustments to influence China's monetary conditions were not well understood and remain controversial, which is reflected in the varying results of empirical research on China's required reserves policy (Ma, Xiandong, and Xi 2013).

Analysis of China's RRR policy became more difficult in 2013–15 due to the exchange rate and interest rate reforms underway, as well as the addition of several liquidity provisioning tools. Use of the medium-term lending facility (MLF) between 2013–15, for example, increased as banks tapped the facility to channel credit to the PBOC's preferred sectors in the economy—a task that might previously have been accomplished through a combination of open market operations and RRR cuts (Jones and Bowman 2019).

In evaluating its transition from the computation of RRR from a "time-point" framework to an averaging method, the PBOC noted that the level of bank reserves and money market rates remained stable (PBOC 2015l).

⁸ Per Yahoo Finance, 1 USD = 6.3215 CNY (onshore) as of August 12, 2015.

Context: China 2015–2016		
GDP (SAAR, nominal GDP in LCU converted to USD)	\$11.1 trillion in 2015	
	\$11.2 trillion in 2016	
GDP per capita (SAAR, nominal GDP in LCU converted to USD)	\$8,016 in 2015	
	\$8,094 in 2016	
Sovereign credit rating (five-year senior debt)	2015	Moody's: Aa3
		S&P: AA-
		Fitch: A+u
	2016	Moody's: Aa3
		S&P: AA-
		Fitch: A+u
Size of banking system	\$18.6 trillion in 2015	
	\$20.1 trillion in 2016	
Size of banking system as a % of GDP	168.6% in 2015	
	179.3% in 2016	
Size of banking system as a % of financial system	Data not available in 2015	
	Data not available in 2016	
Five-bank concentration of banking system	57.6% in 2015	
	55.8% in 2016	
Foreign involvement in banking system	Data not available in 2015	
	Data not available in 2016	
Existence of deposit insurance	Data not available in 2015	
	Data not available in 2016	
<i>Sources: Bloomberg; World Bank Global Financial Development Database; World Bank Deposit Insurance Dataset.</i>		

Key Design Decisions

1. Purpose: The PBOC's RRR cuts allocated credit throughout China's economy and, in the midst of the 2015–2016 crisis, managed liquidity in the banking sector.

In its second-quarter 2006 Monetary Policy Report, the PBOC explained that it initially used reserve requirements to ensure commercial banks had sufficient liquidity to cover unexpected payments, but that over time it had become a tool for the PBOC to manage banking sector liquidity (PBOC 2006). The PBOC began using required reserves as a policy tool regularly in 2007 (Ma, Xiandong, and Xi 2013).

The PBOC's crisis-relief RRR cuts were preceded by three cuts in February, April, and June for credit allocation. With the equity market disruptions in August, however, the PBOC cut the RRR by 50 bps for all financial institutions, as it sought to maintain liquidity in the banking system amid the large equity markets disruption (PBOC 2015d). In October, the PBOC cut the RRR once more for liquidity management, providing a 50-bps cut for all financial institutions and a further 50-bps cut for firms with significant agricultural lending (PBOC 2015e). In each case, the PBOC also stated an objective to continue credit flow to preferred sectors.

2. Part of a Package: The PBOC accompanied RRR adjustments with changes to its benchmark interest rates, while also introducing and expanding additional facilities to support banking sector liquidity.

The PBOC adjusted the benchmark interest rates at the same time as its June, August, and October RRR cuts (PBOC 2015d; PBOC 2015e; PBOC 2015m).

Besides the RRR, the PBOC managed liquidity through open market operations, including transactions with government deposits, repurchase agreements (repos), and the issuance of new, longer-dated central bank bills (CBBs),⁹ a typically short-term debt instrument designed to absorb liquidity (Wang and Hu 2011).

In 2015, the PBOC complemented, or structured, its open market operations with several new lending facilities, catering to different market participants focused on both real economy lending and banking sector liquidity:

- The medium-term lending facility (MLF), introduced in 2014, supplied banks with three- to 12-month funding, conditional on their use of the funds to channel credit to the PBOC's preferred sectors, including, among others, small, private enterprises. Participants borrowed at a rate slightly above the PBOC's repo rate (Jones and Bowman 2019).¹⁰ In 2015, the PBOC conducted a total of 219.48 billion yuan in MLF

⁹ The PBOC initially used treasury bonds or securities as sterilization tools, but, in September 2002, it replaced all outstanding securities with CBBs for use in open market operations (Ouyang, Rajan, and Willett 2010).

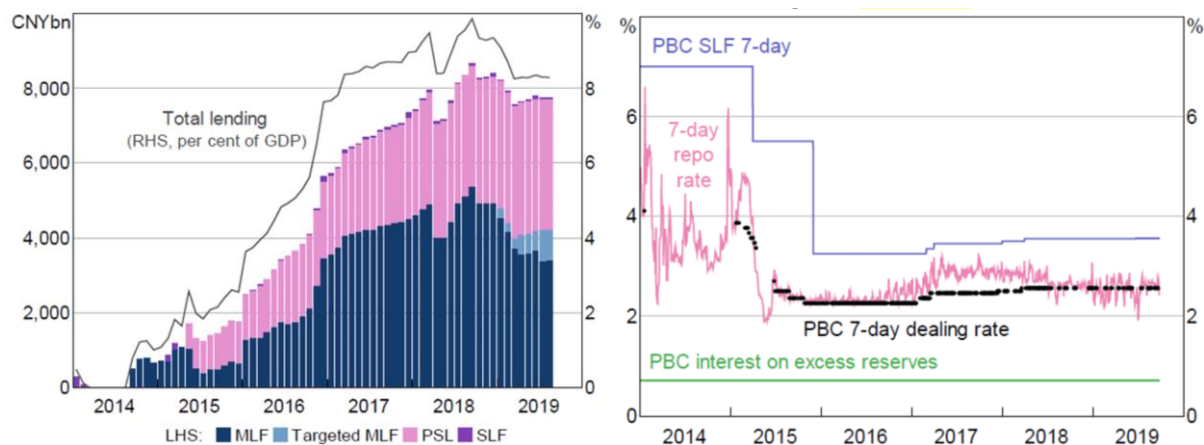
¹⁰ In 2018, the PBOC introduced a variation of the MLF with a lower interest rate and a longer duration of up to three years, called the targeted medium term-lending facility (Jones and Bowman 2019; PBOC 2018; Yiping Huang, Ge, and Wang 2020, 50).

operations—including 101.45 billion yuan, 51.45 billion yuan, 36 billion yuan, and 30.58 billion yuan in each quarter—with an outstanding balance of 66.58 billion yuan by the end of 2015. In the first half of 2015, the maturity on all MLF operations was three months, but in the second half of the year, the PBOC extended the maturity to six months and cut the interest rate charged by 15 bps in response to market demands for liquidity (PBOC 2015m).

- The pledged supplementary lending facility (PSL), also introduced in 2014, provided three- to five-year funding to policy banks—initially, the China Development Bank and, in 2015, the Agricultural Development Bank of China and the China Export-Import Bank—in direct support of the central government's housing redevelopment projects and other initiatives (Jones and Bowman 2019). In 2015, the PBOC provided a total of 698.1 billion yuan to these three policy banks through the PSL, with an outstanding balance of 1.08 trillion yuan by the end of the year.
- The standing-lending facility (SLF), introduced in 2013, helped market participants meet unexpected short-term liquidity shortfalls, but its use was minimal and often stigmatized (Jones and Bowman 2019). In 2015, the PBOC conducted a total of 334.84 billion yuan in SLF operations, nearly all of which took place in the first quarter of the year. By the end of 2015, the SLF had an outstanding balance of 40 million yuan (PBOC 2015m).

Also in 2013, the PBOC established short-term liquidity operations (SLOs). This monetary policy framework effectively established a corridor to the overnight bank rate, with the seven-day interest rate at the SLF providing the ceiling, and the remuneration rate on excess reserves providing the floor (see Figure 1) (Huang, Ge, and Wang 2020; Ma, Xiandong, and Xi 2013; McMahon et al. 2018).

Figure 1: The PBOC's Lending Facilities (left) and Their Influence on Interest Rates (right)



Note: Seven-day repo rate reflects volume-weighted, daily-average repo transactions between depository and non-depository institutions.

Source: Jones and Bowman 2019.

3. Legal Authority: The PBOC's enabling law empowers the central bank to require financial institutions to hold reserves at specific ratios, and to manage the rules governing those reserves.

The Law of the People's Republic of China on the PBOC (PBOC's enabling law) permits the central bank to require financial institutions to place deposits with the central bank at a prescribed ratio (Tenth NPC 2003b, ch. 4, article 23(1)).

Article 32 of the PBOC law empowers the PBOC to govern the rules and regulations on reserves (Tenth NPC 2003b, article 32(1)). The PBOC needed State Council approval before adjusting bank deposit and lending rates, but the PBOC may have had greater control over changes in the RRR (Fungáčová, Nuutilaine, and Weill 2015; Ma, Xiandong, and Xi 2013).

The PBOC may redefine the reservable deposit base to include different types of deposits in order to adjust the effective reserve requirements without altering headline RRR (Ma, Xiandong, and Xi 2013).

Commercial banks are bound by the Chinese Commercial Bank Law, which stipulates that banks must place deposits with the PBOC and maintain sufficient provision for payment in accordance with the PBOC's regulations¹¹ (Tenth NPC 2003a, ch. III, article 32).

The PBOC Law states that the goal of China's monetary policy is to maintain currency stability and facilitate economic growth (Gang 2019; Tenth NPC 2003b, ch. 1, article 3). In

¹¹ Chapter VIII, article 77(3) of the Commercial Bank Law identifies the penalties for noncompliant commercial banks.

practice, this meant that PBOC policy was also directed toward other policy goals, such as providing affordable financing to economic sectors or geographical areas (Fungáčová, Nuutilaine, and Weill 2015).

4. Administration: The PBOC administered reserve requirement policy under the guidance of the central government.

The PBOC administered all changes to the RRR.

5. Governance: The PBOC had relative independence in adjusting the reserve requirement ratio, unlike most monetary policy matters that required State Council approval.

Article 7 of the PBOC Law states that the PBOC forms monetary policy under the leadership of the State Council, the highest government body in China,¹² and independent from the influence of other government offices or individuals (Tenth NPC 2003b, 2). The State Council determined the functions, responsibilities, composition, and procedures of the PBOC's Monetary Policy Committee (Tenth NPC 2003b, ch. 2, article 12).

According to Article 5 of the PBOC Law, the PBOC submitted all decisions related to China's money supply, interest rates, and exchange rates, among other issues, to the State Council (Tenth NPC 2003b). In practice, many regulatory and financial sector agencies were involved in setting the exchange rate and interest rate limits, but the State Council had the ultimate decision (Elliott and Yan 2013; Wang and Hu 2011).

The PBOC Law required the central bank to submit work reports to the Standing Committee of the National People's Congress (NPC) on the conduct of monetary policy and the operations of the financial sector and to record its monetary policy decisions and procedures for the State Council (Tenth NPC 2003b, ch. 1, articles 5-6; ch. 2, article 12).

6. Communication: The PBOC communicated changes to the RRR through press releases and characterized required reserves both as a credit allocation tool and a way to manage liquidity.

The PBOC announced RRR adjustments in press releases, and they typically became effective one week after announcement. In its 2009 Annual Report, the PBOC cited a requirement by the State Council to increase publicity and education around its crisis response and measures to grow the Chinese economy (PBOC 2010).

In its 2015 Annual Report, the PBOC characterized all of its RRR cuts that year as a response to downward economic pressures and as a means "to compensate for the long-term liquidity

¹² However, the highest decision-making body in the country is the Standing Committee of the Politburo (Elliott and Yan 2013). See Figure 5 for a hierarchy of the Chinese financial system.

gap,” alongside open market operations (including reverse repos and SLOs) and lending through the MLF and PSL (PBOC 2015i).

However, the PBOC described its first three RRR cuts of 2015 differently when it announced them. In July, the PBOC characterized its “targeted” February, April, and June cuts as “strengthening the capacity of financial institutions to support the developments of agricultural sector, rural areas and farmers and micro and small enterprises, . . . supporting the key areas and weak sectors in national economy, and providing financial support to popular entrepreneurship and innovation” (PBOC 2015f).

In August and October, the PBOC noted both the credit allocation goal and the liquidity goal in announcing RRR cuts (PBOC 2015d; PBOC 2015e).

In its Monetary Policy Report for the fourth quarter of 2015, the PBOC noted that cutting the RRR sent a strong easing signal, and that such a policy adjustment “may enhance easing expectations, which then will lead to heightened depreciation pressures on the local currency, accelerated capital outflows, and declines in the foreign exchange reserves” (PBOC 2015m, 57).

7. Assets Qualifying as Reserves: The PBOC required banks to hold all required reserves at the PBOC.

The PBOC required banks to hold all required reserves as deposits at the PBOC; they could use those reserves for intraday settlements (Ma, Xiandong, and Xi 2013).

Since August 2007, the PBOC required commercial banks to deposit reserves in the form of foreign exchange, which were considered external assets on the PBOC’s balance sheet because they were managed by the State Administration of Foreign Exchange (SAFE), which is part of, but distinct from, the PBOC (Setser and Pandey n.d.).

8. Reservable Liabilities: The PBOC’s public statements did not include lists of reservable liabilities.

Shortly after its introduction in 1984, the PBOC’s RRR regime differentiated by deposit type, including corporate deposits, savings deposits, or demand deposits. During the GFC, the PBOC’s reserve requirement covered most deposits, but the PBOC did not specify these deposit types and likely differentiated the RRR based on financial institution type only (Ma, Xiandong, and Xi 2013).¹³

In January 2015, the PBOC redefined the coverage for reserve requirements to include deposits for securities transactions and settlements, deposits by banks for non-financing purposes, deposits by SPVs, deposits by other financial institutions, and deposits by overseas

¹³ Ma, Xiandong, and Xi (2013) note that the reservable deposit base was expanded in September 2011 to include some margin deposits; this expansion effectively hiked the RRR by 125 bps.

financial institutions.¹⁴ However, the PBOC applied a reserve requirement of zero to these deposit types (PBOC 2014f). The PBOC's public statements in 2015 did not address whether the RRR cuts applied to these deposit types.

9. Computation: In 2015, the PBOC replaced a “time-point” computation with an averaging method, which allowed banks’ reserves to fall as much as 1% below the required level on any given day.

Since the PBOC began adjusting the RRR more regularly in 2007, the PBOC used a “time-point” assessment. Chinese banks generally relied on deposit funding. Thus, given the low remuneration rate on required reserves, a high RRR imposed a large opportunity cost¹⁵ on banks. Under the time-point framework, banks had to meet the RRR on a daily basis (based on a 10-day rolling average of the stock of deposits) and therefore tended to hold excess reserves as a buffer, averaging 1.5% of deposits in 2011 (Ma, Xiandong, and Xi 2013; Turner, Tan, and Sadeghian 2012).

In September 2015, the PBOC revised the RRR assessment from a time-point framework to an averaging method. Under this method, the PBOC applied the RRR to the average end-of-day reserve balances between the fifth day of a 10-day period and the fourth day of the next 10-day period, divided by the deposit balance at the end of the previous 10-day period (PBOC 2015l).

The PBOC also said that the reserves on any given day could be up to 100 bps lower than the RRR. The PBOC said this feature would provide “an important buffer mechanism. During the assessment period, the reserves of a financial institution may be less than the requirement at some points, as long as the overall average reaches the reserve requirement.” The PBOC noted that the level of bank reserves and money market rates were “stable with a slight decrease” throughout the transition to the averaging method. It said that a small number of banks had slightly overdrawn on their reserves as “an effective response to meet short-term fluctuations. Such behavior has promoted market stability at the macro level” (PBOC 2015l, 11–12).

In 2011, the PBOC formally introduced dynamically differentiated reserve requirements. Once the requirements were implemented, the PBOC frequently recalibrated the “parameters” of the adjustment mechanism to take new factors into account, and generally computed a firm’s applicable RRR based on its capital adequacy, presence in agricultural lending and rural provinces, and internal and risk controls. In 2015, the PBOC considered five factors: 1) the recipients of “agro-supporting” and small-business loans, 2) the capital

¹⁴ Previously, these deposits had been recorded under the interbank account item in the PBOC’s statistical coverage.

¹⁵ Because a policy-rate hike, intended to be contractionary, might have attracted foreign capital inflows and offset the monetary tightening, an increase in unremunerated (or partially remunerated) reserves effectively “taxed” banks by raising the lender’s cost of capital and the cost of credit in the economy, and may have widened the loan-deposit rate spread (within the state-mandated deposit rate cap) (Ma, Xiandong, and Xi 2013).

adequacy ratio, 3) internal and risk controls, 4) the launch of new branch offices, and 5) regional development (PBOC 2015l).

10. Eligible Institutions: The PBOC cut the RRR for all deposit-taking institutions, although it sometimes set different RRRs for different types of institutions.

Required reserves generally applied to all Chinese-domiciled financial institutions. The PBOC Law defines “financial institutions” as Chinese-domiciled policy banks, commercial banks, urban credit cooperative, rural credit cooperatives, and other deposit-taking institutions (Tenth NPC 2003b, ch. 8, article 52). Four of the five RRR cuts that the PBOC made in 2015 were targeted at specific institutions, largely involved in lending to rural areas and the agricultural sector, or for the purposes of financing leases or car purchases. Institutions had to meet certain criteria on solvency, which the PBOC did not make public; the PBOC noted that the four targeted RRR cuts applied to more than 98% of all financial institutions (PBOC 2015m).

11. Timing: The PBOC eased reserve requirements beginning on February 5, 2015, and maintained a lower RRR throughout 2016.

On February 5, the PBOC’s Monetary Policy Committee met and, under the orders of the central government, cut benchmark interest rates and the RRR for small and medium-size institutions by 50 bps (PBOC 2015a).

The MPC met four more times in 2015, and cut the RRR for institutions on each occasion: April 20, June 28, August 25, and October 24 (PBOC 2015b; PBOC 2015c; PBOC 2015d; PBOC 2015e).

RRR adjustments took effect roughly one week after they were announced. The PBOC said this gave financial institutions a sufficient amount of time to adjust their reserves (PBOC 2006).

12. Changes in Reserve Requirements: The PBOC cut the RRR five times in 2015, and frequently adjusted the parameters for its differentiated reserve requirements, offering larger RRR cuts for rural institutions, agricultural lenders, and auto finance companies.

The PBOC held the RRR steady through 2013 and 2014, with a headline RRR for large institutions of 20%. In 2015, the PBOC adjusted the RRR on five occasions, including four “universal cuts,” applying to all depository institutions (for a cumulative 250 bps), and five “targeted” cuts, which reduced the RRR another 50-650 bps from the headline level (PBOC 2015m). The PBOC maintained these RRR levels through 2016.

In February 2015, the PBOC announced two differentiated cuts to the headline RRR. First, the PBOC announced a 50-bps cut for all financial institutions to 19.5%, without stating a purpose. Second, it announced an additional 50 bps cut for city commercial banks and noncounty-level rural commercial banks, to 19.5%, in order to “support structural adjustments” and to increase lending to small and micro enterprises, the agricultural sector,

rural areas, and major water conservancy projects. The PBOC also cut the RRR for the Agricultural Development Bank of China by an additional 400 bps (PBOC 2015a).

In April 2015, the PBOC cut the RRR for the same reasons and further differentiated by institution type. The PBOC cut the headline for all institutions by 100 bps. Based on the results of “dynamic evaluations of financial institutions,” the PBOC offered an additional 100-bps cut for rural institutions, banks, credit cooperatives, financial leasing companies, and auto financing companies, to 11.5%; an additional 50-bps cut for state-owned enterprises with significant lending to the agricultural sector, to around 18.5%; and an additional 200 bps for the Agricultural Development Bank of China, to around 10.5% (PBOC 2015b; PBOC 2015k). The preferential cuts to the Agricultural Development Bank of China, on top of the headline cuts totaling 150 bps, brought its applicable RRR down from 18% in early 2015 to 10.5% in April (PBOC 2015k).

After the April 2015 cuts, the level of reserves in the banking system reached a record high, and the PBOC forecasted excess reserves of USD 475 billion by June. At the time, the PBOC said liquidity in the banking system remained adequate, and that it was unnecessary to provide extra liquidity by cutting the RRR for all financial institutions. It said its June 2015 RRR cuts were targeted toward support for “the development of the real economy” and “to promote structural adjustment” (PBOC 2015f).

By August, however, the PBOC announced another 50-bps RRR cut for all financial institutions following the large equity markets disruption (see Figures 3 and 4). The PBOC also announced a further 50-bps reduction for rural institutions, banks, and credit cooperatives, to 10.5%; and an additional 300-bps cut for financial-leasing and auto-financing companies, to around 13.5% (PBOC 2015d). In October, the PBOC cut the RRR once more for the purpose of liquidity management, implementing a 50-bps cut for all financial institutions and a further 50-bps cut for firms with significant agricultural lending (PBOC 2015e).

Figure 2: Differentiated Reserve Requirement Ratio (RRR) Adjustments in China, 2015

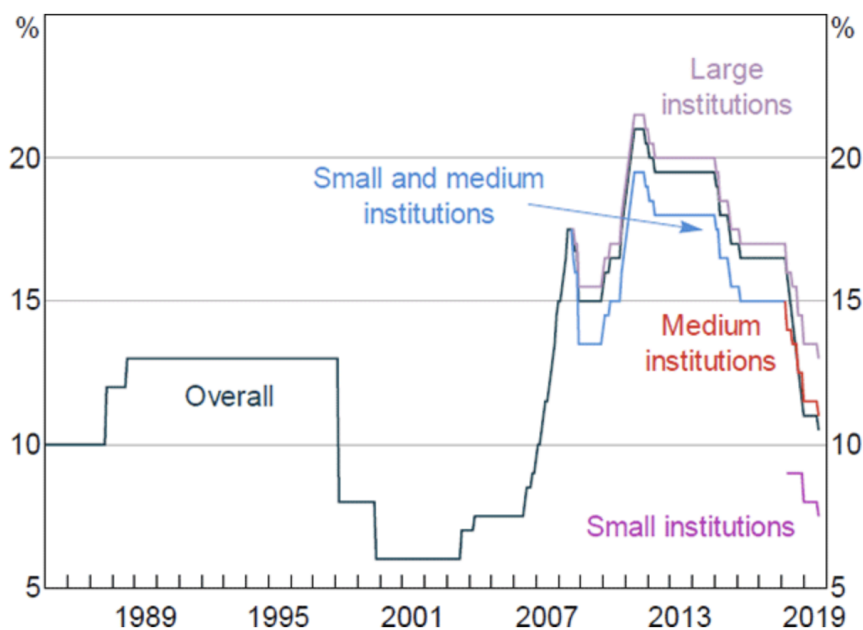
ADDITIONAL RRR CUTS DIFFERENTIATED BY:

Effective Date	All Financial Institutions	INSTITUTION TYPE		SPECIFIC INSTITUTIONS	BUSINESS ACTIVITY		
		Rural	City	Agricultural Development Bank of China	Auto financing	Unspecified Finance	Agricultural lending
February	- 50 bps	- 50 bps	-	- 400 bps	-	-	-
April	- 100 bps	- 100 bps	-	- 200 bps	- 50 bps	-	- 50 bps ^A
June	-	- 50 bps	- 50 bps	-	-	- 300 bps	- 50 bps ^A
August	- 50 bps	-	-	-	-	-	-
October	- 50 bps	-	-	-	-	-	- 50 bps

^A Applied to state-owned enterprises with agricultural loan portfolios only.

Sources: PBOC 2015a; PBOC 2015b; PBOC 2015c; PBOC 2015d; PBOC 2015e.

Figure 3: China's Differentiated Reserve Requirement Ratios



Source: Jones and Bowman 2019.

Deposit/Savings/Term Rates

The PBOC was able to redefine the reservable deposit base to alter effective reserve requirements without changing the headline RRR; however, it does not appear the PBOC did

so during this period. In September 2011, the PBOC had expanded the reserve deposit base to include some margin deposits, such as those used to collateralize banker acceptance or letters of credit, in order to curtail off-balance sheet lending while maintaining tight monetary policy (Ma, Xiandong, and Xi 2013; PBOC 2011c). Financial institutions were required to comply with this change in reservable deposits within three to six months (PBOC 2011c).

Local/Foreign Currency Rates

The PBOC's headline RRR changes applied to local currency deposits; the rate on foreign currency deposits remained 5% from 2007 to 2021 (Ma, Xiandong, and Xi 2013).¹⁶

On January 18, 2016, the PBOC announced that the renminbi deposits of foreign banks in domestic banks would be subject to the same RRR as other renminbi deposits (PBOC 2016a).

13. Changes in Interest/Remuneration: The PBOC remunerated only local currency deposits and cut this remuneration rate once, in 2008.

Since it was established in February 2002, the PBOC's remuneration rate on required local currency deposit reserves remained fixed at 1.89% (Ma, Xiandong, and Xi 2013; Lardy 2008). In late 2008, the PBOC cut the remuneration rate on required reserves of local currency deposits to 1.62% (Ma, Xiandong, and Xi 2013). Excess reserves were remunerated at 0.72% (BOC 2015). The PBOC generally remunerated reserves at a below-market rate—lower than the rate paid on central bank bills or government bonds (Ma, Xiandong, and Xi 2013; Wang and Hu 2011).

Foreign currency deposits were not remunerated (Ma, Xiandong, and Xi 2013).

14. Other Restrictions: The PBOC did not attach restrictions to RRR adjustments.

The PBOC did not attach additional conditions or restrictions to its RRR adjustments.

15. Impact on Monetary Policy Transmission: The PBOC used its reserve requirements policy in combination with open market operations to manage liquidity and implement monetary policy.

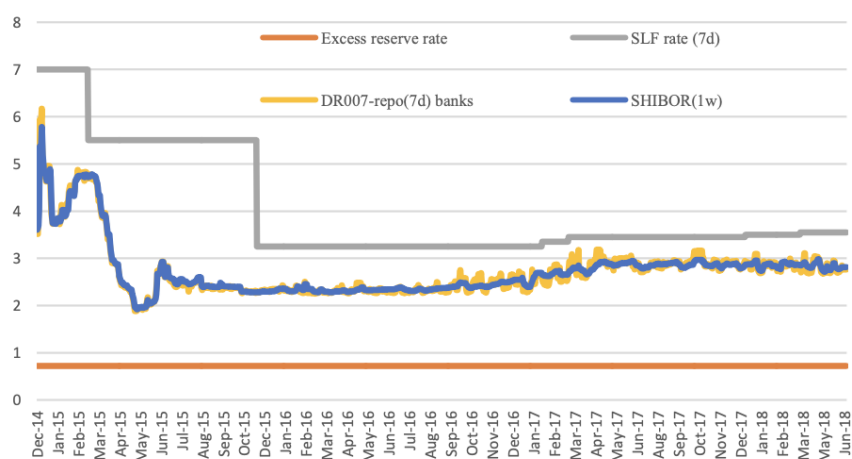
China's monetary policy consisted of quantity-based tools—including required reserves, as well as “window guidance,” credit quotas, and other administrative measures—and price-based tools, such as benchmark rates (and other policy interest rates) and open market operations (Fungáčová, Nuutilaine, and Weill 2015). PBOC Governor Yi Gang stated that the central bank managed liquidity with open market operations and required reserves and adjusted the money supply with central bank lending (Gang 2019). Given China's exchange rate regime and interest rate policy, the PBOC's monetary-policy framework relied more on RRR adjustments than open market operations (Ma, Xiandong, and Xi 2013). Often, the PBOC

¹⁶ The rate on foreign currency deposits was 3% in 2005, 4% in 2006, and 5% beginning May 2007, where it remained through the end of the next decade (ChinaDaily 2021; China Knowledge 2021).

coordinated benchmark interest rate cuts and decreased CBB issuance with RRR cuts (PBOC 2008).

Historically, deposit rates operated in a corridor with the baseline lending rate acting as the floor and the baseline deposit rate constituting a ceiling (Prasad and Zhang 2014, 195). Since 2015, the PBOC targeted the seven-day repo rate (“DR007”), between an interest rate corridor with a ceiling defined by the SLF (or MLF) interest rate and the floor by the remuneration rate on excess reserves (see Figure 4) (Huang, Ge, and Wang 2020). Throughout 2015, the PBOC continued efforts to formally liberalize interest rates, a process started in 2003 (see Figure 7 in Appendix A) (McMahon et al. 2018; Prasad and Zhang 2014).¹⁷

Figure 4: The PBOC’s Interest Rate Corridor



Source: McMahon et al. 2018.

16. Duration: The PBOC did not preannounce a schedule for its RRR cuts, which ended on October 24, 2015.

The PBOC eased the RRR beginning on February 5, 2015, and made its last cut on October 24, 2015. The PBOC did not preannounce an end date to the easing, nor state publicly the criteria under which it would discontinue its easing.

¹⁷ In May 2015, the PBOC expanded the upper limit of the floating range for the deposit rate from 1.3 to 1.5 times the benchmark rate. In August 2015, the upper limit of deposit rates was fully liberalized for fixed terms longer than one year. In October, the PBOC eliminated the upper limit of the deposit interest rate for commercial banks and rural credit cooperatives and began focusing on short-term interest rates, such as the Shanghai Interbank Offered Rate (SHIBOR) (McMahon et al. 2018; Yiping Huang, Ge, and Wang 2020).

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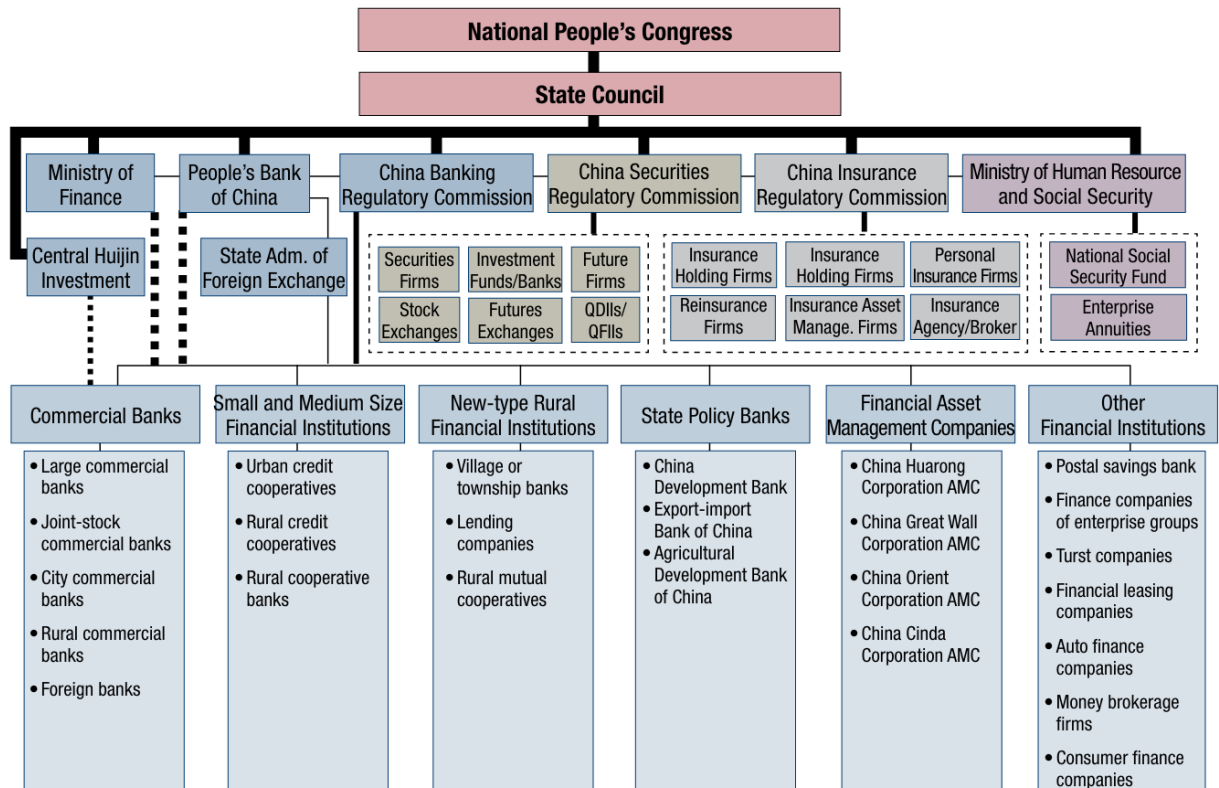
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Appendixes

Appendix A

Figure 5: Overview of the Chinese Financial System



Notes: The thickest connecting lines correspond to the highest levels of authority in financial policy making. The NPC promulgates all financial sector laws and the State Council executes financial regulation and issues mandatory policy directives to all the financial regulatory and supervisory agencies. The dotted connecting lines indicate the three primary functions of PBC—formulating monetary policy, maintaining financial stability, and providing financial services—and the triple role of the MOF as tax administrator, treasurer, and owner of several commercial banks. The thinner connecting lines emerging from CBRC, CSRC, CIRC, and MHRSS reflect that these entities are mostly responsible for regulating and conducting supervision and oversight of their respective financial sectors. *Additional notes:* The SAFE is responsible for foreign exchange operations of securities and insurance companies. The China Development Bank and the Postal Savings Bank are in the process of reforming into commercial banks. Central Huijin exercise rights and obligations as an investor in major state-owned financial enterprises on behalf of the State. The National Social Security Fund has also a dual role as an institutional investor and a stakeholder in some of the largest commercial banks.

Source: Elliott and Yan 2013.

Figure 6: The PBOC's Monetary Policy Tools

Monetary policy instruments	
Open market operations	Quantity-based indirect tool, including repurchases transactions, outright transactions ^a and the issuance of central bank bills ^b .
Required reserve ratio	Discretionary and more direct tool.
Interest rates	Price-based tool, including various central bank base interest rates ^c . The deposit rate and lending rate of commercial banks are highly regulated.
Specific credit policy instruments	
Specific central bank lending schemes	Discretionary tool. Under certain specific eligibility requirements, the PBC provides special funds at a lower cost for a particular group of industries or regions.
Window guidance ^d	Administrative tool in a form of "moral suasion" or "indirect pressure" through regular meetings with commercial banks so as to influence the quantity and the structure of bank lending.

Notes: a. Outright transactions include outright purchase and outright sale, by which the PBC buys/sells securities directly from/to the secondary market to increase/decrease base money. b. Central bank bills are short-term securities issued by the PBC, which were introduced in 2002 to deal with the inadequate supply problem of government bonds. Through issuing central bank bills, the PBC can effectively reduce the money supply. The PBC has used them extensively to offset rises in liquidity in the banking system as a result of the PBC's foreign exchange purchases. Therefore, central bank bills are often referred as sterilization bonds. c. They include the central bank lending rate, the rediscount rate, the interest rates paid on the required and excess reserves. d. The Bank of Japan exercised this practice as well in the post-War era until the early 1990s.

Source: Sun 2013.

Figure 7: Liberalization of Chinese Banks' Deposit and Lending Rates

Year	Key reform steps
1983	Granted right to PBOC to adjust benchmark lending rate
1998-2004	Gradually increased the upper limit on lending rates
1999	Liberalized interest rate in deposit wholesale market
2000	Liberalized foreign currency lending rates
2000	Liberalized foreign currency deposit rates for deposits over \$3 million
2003	Removed floor on foreign currency deposit rates
2004	Removed ceiling on lending rates
2004	Removed floor on deposit rates
2012	Increased the lower limit on lending rates
2012-2015	Gradually increased the upper limit on deposit rates
2013	Removed floor on lending rates
2015	Adopted the deposit insurance scheme; Removed ceiling on deposit rates

Source: Huang, Ge, and Wang 2020.

Appendix B: China's Macroprudential Assessment (MPA)

Under the direction of CCP's 12th Five-Year Plan, the PBOC drew lessons from the Group of 20's response to the Global Financial Crisis and the Financial Stability Board to study macroprudential management (PBOC 2015m). In 2011, it formally introduced a differentiated reserves and dynamic adjustment mechanism, with a core content whereby appropriate credit growth of financial institutions depends on the reasonable needs of economic growth and their own capital levels. In the five years since its implementation, the mechanism has played an important role in strengthening macroprudential management, promoting steady credit growth, and maintaining stability in the financial system.

At the beginning of 2016, the PBC introduced the MPA to help address macroprudential risks in the financial system. The assessment uses a scoring system (0–100) for 16 indicators across seven categories to assess the soundness of banking institutions and their compliance with national directives. These categories were (1) capital and leverage, (2) balance sheet, (3) liquidity, (4) pricing behavior, (5) asset quality, (6) crossborder financing risks, and (7) credit policy implementation (PBOC 2015i, 28).

Appendix C: Reserve Requirements Policy 2010–2013, after the Global Financial Crisis and during the Taper Tantrum

China's response to the Global Financial Crisis (GFC) combined the world's largest fiscal stimulus package by dollar value with a broad easing of monetary policy. Yet the crisis response measures announced in 2008 and implemented in 2009–10, successful as these were in suppressing a financial crisis and maintaining target economic growth, inadvertently introduced vulnerabilities to China's financial system, which were nearly exposed in the Taper Tantrum of 2013 (Ahmed et al. 2019; IMF 2013; Zheng et al. 2017).¹⁸

Of the CNY 4 trillion (USD 586 billion¹⁹) stimulus, the Central Committee of the Communist Party of China and the State Council (collectively, the central government) directed USD 443 billion to local governments to spend on infrastructure (Wong 2011). Local governments supplemented the stimulus by borrowing from policy banks²⁰ and commercial banks and, much later, from trust companies and by issuing debt. The central government forbade local governments from borrowing directly, so they borrowed indirectly through special-purpose vehicles (LGFVs) that borrowed against municipal land and enjoyed implicit debt repayment support from the local government²¹ (Ahmed et al. 2019; Bai, Hsieh, and Song 2016; IMF 2013; Wong 2011; Zheng et al. 2017). LGFV investment—combined with the central government's orders for banks to increase lending to, among other things, local government infrastructure projects—fueled an explosive period of credit growth: Between 2008 and 2010, local government debt rose from USD 146 billion to USD 1.7 trillion (Dieppe et al. 2018; Sum 2013).

This infrastructure investment, financed by the banking sector, was one way to counter falling productivity growth and secular trends, including a diminishing workforce and an aging population (IMF 2013). Yet aggregate demand, stimulated by fiscal largesse, soon exceeded the supply of goods and services, and inflation hit 6.6% in 2011 (OECD 2013). In

¹⁸ The so-called Taper Tantrum refers to the emerging-market turmoil that followed the Federal Reserve's announcements in May–June of 2013 that it would end its third cycle of quantitative easing and begin tapering its purchases of securities, thereby lowering bond prices and causing yields on US bonds to rise.

¹⁹ Per Yahoo Finance, 1 USD = 6.365 CNY (onshore) as of November 30, 2011.

²⁰ The “policy banks,” which were formerly state owned, included the Industrial and Commercial Bank of China, the Agricultural Bank of China, the Bank of China, the China Construction Bank, and the Bank of Communications (PBOC 2009). In 2005, all five banks were converted to joint-stock companies. Together, they accounted for 52% of total banking assets in 2008 (Fungáčová, Nuutilaine, and Weill 2015).

²¹ LGFVs, alternatively known as “local government investment corporations,” were introduced in the 1980s to solve an inherent contradiction in China's fiscal system: Local governments were tasked with public services and infrastructure yet were not allocated sufficient funds from the national budget and were forbidden from borrowing directly. A typical LGFV contributes some minimum equity stake, then raises funds from, for example, bond issuance, commercial bank loans, rental incomes from locally owned property, fees on public utilities, and allocation from the national budget (Lu and Sun n.d.; Wong 2011). Investment projects—water utilities, railways, bridges, etc.—would be backed by municipal land ownings (allocated by the central government) and implicitly guaranteed by the local government, which itself enjoyed the implicit guarantee of the central government (Dieppe et al. 2018; Yiping Huang 2014). Thus, large commercial banks were eager to lend to LGFVs at the direction of the central government. For a detailed history of LGFVs and their role in the credit boom following the GFC, see Wong (2011).

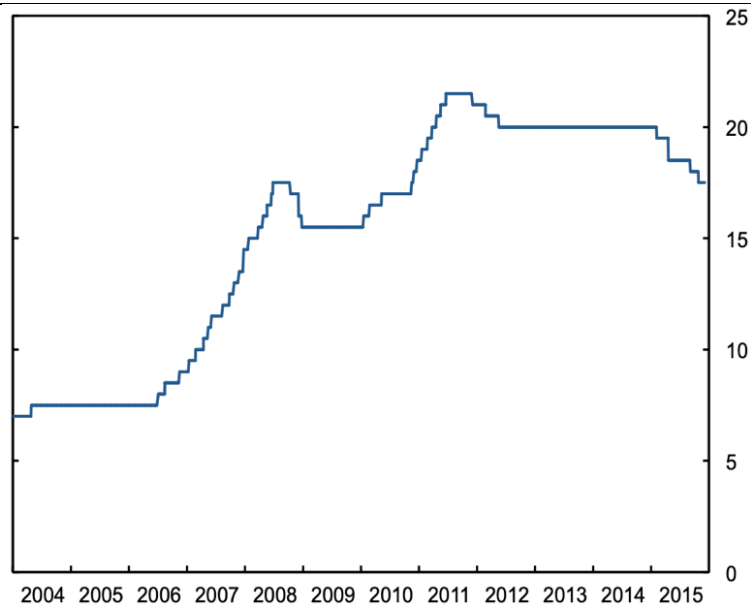
response to this inflationary environment, and concerned about the amount of leverage in the system, the PBOC tightened monetary conditions by capping deposit and lending rates and increasing supervision over risky lending, including audits of records and a freeze on LGFV lending (Dieppe et al. 2018; OECD 2013; Wong 2011). The PBOC also hiked the required reserve ratio (RRR) for large financial institutions from 15.5% in the beginning of 2010 to a high of 21.5% in June 2011, a level it maintained until late 2011 (Wong 2011).

Meanwhile, a sovereign-debt crisis was unfolding in Europe, triggered by Greece's potential default and emerging risks in Spain and Italy. Amid the uncertainty that such a crisis could spill over into the broader Euro area, and then internationally, global financial markets experienced disruption; in China and other emerging markets, short-term capital flows became volatile. Nevertheless, China reported a net capital inflow in 2011. Yet, over the same period, the PBOC issued less currency to sterilize foreign exchange intervention relative to prior years, which decreased liquidity in the financial sector (PBOC 2011c).²²

By 2012, GDP growth fell to 7.8% as China experienced both demand- and supply-side constraints: Low growth in its trading partners, still recovering from the GFC, affected supply in China's export-driven economy, while depressed wages and rising unemployment within China—coupled with rising property and land prices and household indebtedness, driven by the GFC-era fiscal stimulus—reduced international demand from Chinese consumers (OECD 2013).

In light of these developments, the PBOC, with little explanation at the time, cut the RRR by 50 bps for all institutions on November 30, 2011 (PBOC 2011a). Two 50 bp cuts followed on February 18 and May 12 (see Figure 8). Later, the PBOC would explain that the first cut was a preemptive measure in response to slow domestic growth and global uncertainty over the eurozone crisis, and the following two cuts were made to adjust liquidity in the financial system.

²² The PBOC heavily intervened in international-currency markets to maintain targeted exchange rates of China's currency—the renminbi (RMB), which is denominated in units of yuan (CNY for mainland China use, or CNH for offshore use)—against a basket of major currencies, which mainly comprised USD (Morrison 2009).

Figure 8: China's Reserve Requirement Ratio for Large Financial Institutions (%)

Note: Between July 2006 and June 2011, the PBOC hiked the RRR 33 times for a net increase from 8.5% to 21.5% for large banks (Ma, Xiandong, and Xi 2013). The PBOC cut the RRR another three times going into 2012 and maintained a headline ratio of 20.0% for large banks throughout the Taper Tantrum, before easing the ratio again in 2015.

Source: Zheng et al. 2017.

During this period, the PBOC still used RRR adjustments to manage liquidity and sterilize foreign exchange intervention. But the PBOC's RRR policy evolved on two fronts: First, it transformed its two-tier RRR regime into a regime that further differentiated reserve requirements by institution size, lending activity, and other criteria in order to conform to the central government's preferences for credit allocation; second, it included new macroprudential criteria for RRR differentiation, such as capital adequacy and nonperforming loan ratios, and frequently adjusted these coefficients to improve the resilience of financial institutions (see Appendix B for more details).

In 2011, China formally introduced this "dynamic differentiated reserve requirements" policy, tailoring RRRs to individual banks on a quarterly and sometimes monthly basis according to their holdings of capital and their rate of credit growth (Ma, Xiandong, and Xi 2013; Turner, Tan, and Sadeghian 2012). The PBOC was concerned with the deviation of bank credit from economic growth and the price index, as well as individual institutions' impact on overall trends, a firm's systemic importance, and its soundness (PBOC 2011b). In determining the appropriate RRR, the central bank also evaluated prudential indicators, such as loan-loss provisioning, leverage ratios, and capital adequacy, defined as the sum of a basic capital requirement plus additional charges based on the bank's systemic importance and countercyclical buffers (Ma, Xiandong, and Xi 2013). By differentiating required reserves on these factors, the PBOC sought to "optimize credit structure" by "[guiding] rational, prudent, and steady credit extension of financial institutions" (PBOC 2011b).

Although the PBOC had experimented with RRR adjustments as a macroprudential management tool in 2006 and 2007, the PBOC adopted the recommendations of the 2010 Central Economic Work Conference to formally integrate reserve requirements into its macroprudential framework in 2011 (Yi 2018). In 2014, these policies were incorporated into a more robustly defined Macro Prudential Assessment (MPA) system, with the effect that the PBOC could manage every bank's credit quota during specific periods (the MPA system is briefly described in Appendix B). This, the PBOC determined, was superior to quantity control measures, such as "window guidance," or central government directives on where to allocate credit (CIGI 2018).

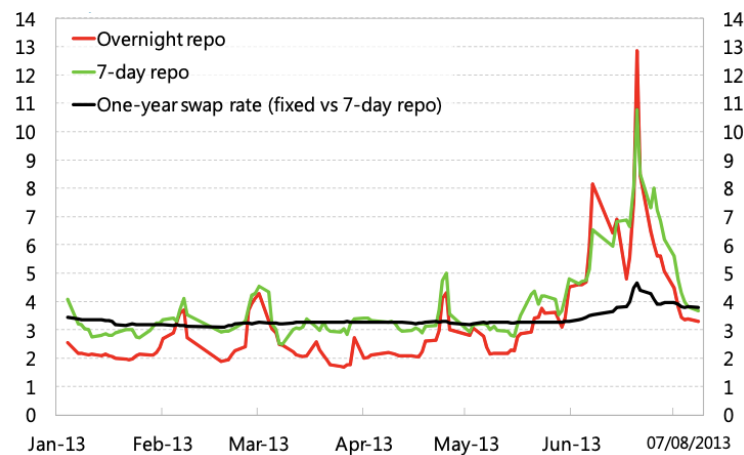
The Taper Tantrum

Neither of the developments in the PBOC's required reserve policy—the evolution of differentiated reserves for credit allocation or for macroprudential policy—played a role in preventing, or addressing, acute market stress that resulted from the 2013 Taper Tantrum.

On May 22, 2013, Federal Reserve Chairman Ben Bernanke announced that the US central bank would begin tapering the bond purchases under its third quantitative-easing campaign (QE3). On June 19, the Federal Reserve released further details of its tapering plans, which caused declining exchange rates, increasing interest rates, and tighter capital controls among large emerging-market economies, including Turkey, Brazil, India, South Africa, and Indonesia (Tooze 2018).

In China, the reaction was less severe overall but coincided with other events that constrained liquidity and combined to disrupt money markets. On June 20, 2013, China's commercial banks experienced a sudden credit crunch as the Shanghai interbank overnight lending rate (SHIBOR) spiked to 30% from its normal level of less than 3% (see Figure 9) (Ahmed et al. 2019). Tao Zhang, who was then International Monetary Fund executive director for China, attributed the interbank volatility to predictable "seasonal and sentimental factors"—June 10–12 was a holiday, and also a payment date for corporate taxes and required reserves—while a PBOC official cited the many recent regulatory announcements and the potential for spillover from the Federal Reserve's tapering (PBOC 2013a; PBOC 2013d). Both officials considered the liquidity available in the banking system to be more than adequate, as evidenced by USD 236 billion in excess reserves (a ratio of 2.1%) (IMF 2013; PBOC 2013b; PBOC 2013d). Beyond its open market operations, its normal central bank lending and discount, and ad hoc short-term liquidity operations, the PBOC had, beginning in early 2013, introduced a suite of supplementary lending facilities, including the standing lending facility, to adjust liquidity and contain volatility (PBOC 2013b; Jones and Bowman 2019).²³ Yet, liquidity conditions remained tight for several days as even liquid banks refrained from lending (IMF 2013).

²³ Money market rates had spiked at the same time the year prior due to the cash demands around the holiday (PBOC 2012). The PBOC subsequently introduced the medium-term lending facility and pledged supplementary lending facility in 2014. The MLF offered three- to 12-month borrowing at a slight premium to the repo rate to support priority sectors, such as small- and medium-size enterprises. The PSL provided three-

Figure 9: Chinese Interbank Interest Rates (%)

Note: The one-year swap rate signals the market's future expectations about the seven-day interbank repo rate, plus a term-premium.

Source: IMF 2013.

The IMF determined that the PBOC deliberately refrained from providing liquidity with the intent of signaling an overall tightening of the vast expansion in credit, especially among the nonbank financial sector that sourced funding from the interbank market (IMF 2013). Moreover, the PBOC claimed that in an environment of adequate liquidity and low short-term interest rates, commercial banks, which it said were driven by profit maximization and regulatory arbitrage, had taken advantage of the interbank market to tap wholesale funding to finance long-term loans, but this exposed them to liquidity mismatches that became apparent in the money market disruptions that June (PBOC 2013d; PBOC 2014g).²⁴ The PBOC subsequently instructed commercial banks to, among other things, maintain a reasonable level of excess reserves (PBOC 2013d).

Although the PBOC did not adjust the RRR in response to this acute shock, it provided liquidity to stressed financial institutions in other ways. In early 2013, the PBOC introduced two additional "discretionary" methods for temporarily adjusting liquidity in the banking sector: short-term liquidity operations (SLOs) and the standing lending facility (PBOC 2013c). SLOs were one- to seven-day repos, whose maturity the PBOC extended when necessary, conducted with systemically important primary dealers (PBOC 2013c). The SLF lent to financial institutions that complied with the PBOC's macroprudential regulations, against high-quality credit or based on credit rating, for up to three months, to meet unexpected liquidity shortfalls with short-term loans (Jones and Bowman 2019; PBOC 2013c; PBOC 2013d; PBOC 2014g). The SLF ultimately saw USD 65 billion outstanding against investment-grade bonds and high-quality credit assets (Jones and Bowman 2019;

to five-year funding, mainly to the four policy banks in support of housing redevelopment and other public infrastructure projects; associated costs are not publicly disclosed (Jones and Bowman 2019).

²⁴ In addition to the seasonal factors mentioned, the PBOC also attributed the complexity of managing liquidity during this period to changes in fiscal revenue and expenditure, as well as treasury funds (PBOC 2014g).

PBOC 2013d). Although central bank bills (CBBs), a typically short-term debt instrument issued by the PBOC, were largely replaced by RRR policy for means of liquidity adjustment, the PBOC began rolling over maturing three-month CBBs at market interest rates and allowed these rolled-over CBBs to be traded on secondary markets and pledged as collateral for open market operations, which also increased (PBOC 2013d).

Citing global economic conditions, the soundness of financial institutions, and its desires to shape credit policy, the PBOC sought to strengthen macroprudential regulation by adjusting the parameters for the differentiated RRR, but these were not publicized.

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