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Requiem for the interest rate controls in China
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Requiem for the Interest-Rate Controls in China

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Keywords: interest-rate control, deregulation, China, financial repression, interest-rate corridor

JEL-Classification: E52, E58
1. Introduction

October 24th 2015 marked the official phase-out of the direct control on retail interest rates in China, with the lift-off of the interest-rate ceiling on deposits. This control could trace back to the planned-economy era. It limited the interest rate that banks could pay on their deposits as well as the interest rate that banks could charge on their loans. That is, banks set their deposit- and lending-rate according to the benchmark rates specified by the central bank (the People’s Bank of China, hereafter the PBC), subject to the limited adjustment bands. The deregulation started in 1993, featured with three periods. In the first period, 1993 through 2004, the PBC relaxed the lending-rate ceiling in several steps, with it finally abolished in October 2004 together with the deposit-rate floor. Between 2005 and 2011, no further deregulation actions took place. The last period, 2012 through 2015, saw deregulation acceleration, with intensive actions sequenced. In 2013, the lending rate was freed from the floor control. Then in 2015, the final control, i.e., the ceiling on the deposit rate, was abolished.

There is rich literature studying deposit-rate ceilings in the U.S., which is known as Regulation Q and was in effect from 1933 to 1986. For example, Gilbert (1986) overviews this history, documenting the legislative objectives of this regulation and its effect on the financial system. More studies focus on the impact of Regulation Q on transmission mechanisms as well as the possible changes in transmission mechanisms over time when encountering the abolishment of Regulation Q (see, among others, Boivin et al. 2010; Koch 2015). By contrast, there has been so far no study that formally documents this history in China. Only a few works study the link between the regulated retail rate and market interest rates (see, e.g., Fan & Johansson 2010; He & Wang 2012; Chen et al. 2013; Ma & Wang 2014).

The purpose of this paper is to fill this gap by providing a review of the retail interest-rate-control deregulation over the 1993-2015 period as well as some thoughts on the new replacement operating framework. I examine the objectives of these controls and their distortionary effects on the economy. Then, this paper ends with a preliminary assessment of the new interest-rate corridor system that the PBC is building and its role in guiding market interest rates.

I show that the interest-rate controls triggered the development of deposit substitutes, such as Wealth Management Products (WMPs) and Money Market Funds (MMFs), that are simple workarounds that banks use to circumvent the restrictions imposed by the controls. The rapid development in WMPs and MMFs drove deposits out of the regulated commercial banks, which resulted in deteriorating bank profits.

A rising shadow banking system in China has evoked the PBC’s concerns about financial instability.2 This led to the post-2012 deregulation acceleration. The retail interest-rate controls were distortionary: they gave rise to disintermediation; they caused financial repression on Chinese households. Despite the official

2 On the other hand, the shadow banking sector provides funding to private sector in China, which is usually more productive and credit constrained. In this regard, it improves the efficiency of credit allocation. The impact of the shadow banking on financial stability and the real economy deserves rigorous analysis, which is beyond the scope of this paper.
lift-off of the control, the retail interest rates are still subject to the PBC’s and banking industry’s “self-regulatory” guidance in mid-2019. The preliminary assessment of the new interest-rate corridor system is encouraging: Its bounds are effective most of the time. However, this system calls for more transparency and greater clearness about the PBC’s explicit target, which include to pin down the target rate as well as its intended numeric value and immediately announce changes in the target rate.

The paper is organized as follows. Section 2 reviews the deregulation of interest-rate controls since 1993. Section 3 introduces a supply-demand framework to assess whether these controls fulfill its objectives. Section 4 examines and quantifies the distortionary effects of these controls. Section 5 presents a preliminary assessment of the interest-rate corridor system. Section 6 concludes.

2. Interest-rate controls and deregulations

The current monetary policy in China is featured with a multiple-instrument and multiple-objective operating regime, with growth rates of M2 and the new total bank lending as its intermediate targets (see, e.g., Zhang & Ji 2012; Bell & Feng 2013; Sun 2015; Klingelhöfer & Sun 2018; Sun 2018b; Klingelhöfer & Sun 2019). The PBC’s policy objectives are threefold: price stability, economic growth, and financial stability, with the former two defined in Article 3 of the People’s Bank of China Act (amended in 2003) and the last defined in Article 2. To achieve various policy objectives, the PBC uses a mix of quantity- and price-based monetary and credit policy instruments, together with administrative tools. They include, for example, the open market operations, central bank lending, the interest rate, the required reserve ratio, and window guidance.

Gradualist deregulations: Direct controls on retail interest rates can be traced back to the planned economy era, when economic activities were centrally planned with various quantities and prices set by central planners, rather than market-determined. The economic reforms started in 1978, and gradually, the Chinese economy has been in transition to a market economy. The central bank reform followed in 1984, separating regular commercial banking activities from the PBC and passing them to commercial banks. However, until the mid-1990s, the PBC was still responsible for setting all kinds of interest rates and asset prices (China Monetary Policy Report 2003-1: 6). The market-based interest-rate reform has been evidenced, first, in the liberalization of China interbank money market rate (CHIBOR) and bond market rate (including the repo rate) in 1996 and 1997, as listed in Table 1, when these two markets started to operate. Ever since, these interest rates are market-determined, with market participants restricted to institutions (e.g., banks, other financial institutions, but not individual investors). This system with the

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3 In 2012, the PBC started to frame its intermediate targets as “money supply and new lending, (…) complemented by analysis of aggregate social financing” in the 12th Five-Year Plan for Financial Sector Development and Reform (China Monetary Policy Report 2012-3: 18).

4 It is “to maintain the stability of the value of the currency and thereby promote economic growth” (Article 3) and to “guard against and eliminate systemic financial risk and maintain financial stability” (Article 2).

5 For more details, see Sun (2013) and Klingelhöfer and Sun (2019).
The coexistence of regulated bank retail rates with market-determined money and bond rates is described as a dual-track interest-rate system in the literature (see, among others, He & Wang 2012; Chen et al. 2013; Yi 2015; El-Shagi & Jiang 2017). “Partial liberalization creates a dual-track price system and distorts the market. The price within the controlled track is usually lower, and that outside the track is higher,” as Yi Gang (2015) puts it. The market segmentation ensures the coexistence of two tracks and two prices.

**Table 1. Liberalization of the money and the bond market**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>On 3 Jan, the interbank borrowing market started to operate.</td>
</tr>
<tr>
<td></td>
<td>On 1 Jun, the interbank money market rate (CHIBOR) was liberalised and market-determined.</td>
</tr>
<tr>
<td>Jun 1997</td>
<td>The interbank bond market started to operate.</td>
</tr>
<tr>
<td></td>
<td>The repo rate and the bond market rate were market determined.</td>
</tr>
</tbody>
</table>

Source: *China Monetary Policy Report (2002Q4).*

In addition to these two principal movements as listed in Table 1, the reforms of the money and the bond market have been evidenced with the introduction of new financial products over time. For example, the (transfer) discount rate started to be determined by banks with reference to the PBC’s rediscount rate in 1998; the Shanghai Interbank Offered Rate (SHIBOR) was introduced as a prime interest rate in the money market in January 2007; interbank deposits were introduced in December 2013; the certificate of deposit (CD) was introduced in June 2015 (*China Monetary Policy Report 2002Q4 and 2003Q4; China Financial Stability Report 2016*).

The reform on the two most important retail interest rates, the interest rates on bank loans and deposits, lagged behind. The PBC used to set the benchmark deposit rates and lending rates (of various maturities) for banks to follow. The regulation on retail interest rates is clearly stated in *The Provisional Regulations of the People’s Republic of China on the Control of Banks* (promulgated by the State Council on 7 January 1986) and the later 1995 *Law on Commercial Banks* (amended twice, 2003 and 2015). More precisely, Article 31 and 38 of *Law* require all commercial banks to set their deposit as well as lending interest rates in accordance with the upper and lower limits for the interest rates prescribed by the PBC. Violation of these regulations is subject to fines and punishment (Article 74).

Table 2 lists the key policy actions to deregulate these two interest rates. Only in 1993, banks were allowed to adjust lending rates around the benchmark within a limited band, with the ceiling at 20% above and the

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6 Such a dual-track approach to marketization is not rare in China as it has been widely used to tackle the fundamental issues inherited from the central planning regimes in, inter alia, the price reform and agricultural market liberalization reform (see, e.g., Qian 2017; Song & Xiong 2018). Qian (2017) lists this approach as one of examples of Chinese “transitional institutions” arrangements that are not “best practice institutions” but “incentive-compatible institutions”. Such transitional institutions made reforms “efficiency improving and interest compatible” as “reform without losers”, but at the cost of its unneglectable distortions on the market. With reforms going deeper in the price reform and agricultural market liberalization reform, the state-protected pricing track has been eventually shut down.
floor at 10% below the benchmark rates (see also Ma 2017). The ceiling for lending rates was reduced to 10% above the benchmark rates in 1996. This floating band was widened in 1998-1999 and 2004. Meanwhile, the deposit rate was under strict regulation. In October 2004, the PBC abolished the lending-rate ceiling and the deposit-rate floor. Following a long quiet period, deregulation retook off in 2012, when the floating bands for both the lending rate and the deposit rate were extended. Since then, deregulation had been accelerating. In July 2013, the lending-rate floor was abolished. In November 2014 and March 2015, the deposit-rate upper band was extended to 1.2 and 1.3 above the benchmark, which was abolished on October 24th 2015.

Table 2. Deregulation of retail interest-rate controls over time (1993-2015)

<table>
<thead>
<tr>
<th>Date</th>
<th>Deregulation actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>Set the lending-rate floating band as $i^L = [0.9, 1.2]</td>
</tr>
<tr>
<td>1996</td>
<td>Reduce the lending-rate ceiling to $i^L = [0.9, 1.1]</td>
</tr>
<tr>
<td>1998</td>
<td>Raise the lending-rate ceiling to $i^L = [0.9, 1.2] for loans issued to small enterprises and to $i^L = [0.9, 1.5] for loans issued by Rural Credit Corporations.</td>
</tr>
<tr>
<td>1999</td>
<td>Raise the lending-rate ceiling to $i^L = [0.9, 1.3] for loans either issued by financial institutions at the county level or below, or loans issued to small and medium enterprises.</td>
</tr>
<tr>
<td>Jan 1, 2004</td>
<td>Raise the lending-rate ceiling to $i^L = [0.9, 1.7]</td>
</tr>
<tr>
<td>Oct 29, 2004</td>
<td>Abolish the lending-rate ceiling and the deposit-rate floor. $i^L = [0.9, \infty); \ i^D = (0, 1]$</td>
</tr>
<tr>
<td>Jun 8, 2012</td>
<td>Extend both floating bands: $i^L = [0.8, \infty); \ i^D = (0, 1.1]$</td>
</tr>
<tr>
<td>Jul 6, 2012</td>
<td>Reduce the lending-rate floor to $i^L = [0.7, \infty)$</td>
</tr>
<tr>
<td>Jul 20, 2013</td>
<td>Abolish the lending-rate floor (with the exception of mortgage loans).</td>
</tr>
<tr>
<td>Nov 20, 2014</td>
<td>Raise the deposit-rate ceiling to $i^D = (0, 1.2]$</td>
</tr>
<tr>
<td>Mar 1, 2015</td>
<td>Raise the deposit-rate ceiling to $i^D = (0, 1.3]$</td>
</tr>
<tr>
<td>May 11, 2015</td>
<td>Raise the deposit-rate ceiling to $i^D = (0, 1.5]$</td>
</tr>
<tr>
<td>Aug 26, 2015</td>
<td>Lift the deposit-rate ceiling for time deposits (of maturity &gt; 1 year).</td>
</tr>
<tr>
<td>Oct 24, 2015</td>
<td>Lift the deposit-rate ceiling.</td>
</tr>
</tbody>
</table>

Note: $i^L$ denotes the lending rate and $i^D$ for the deposit rate. The floating band, for example, $i^L = [0.9, 1.2]$ in 1993, means that banks were allowed to adjust lending rates around the benchmark, with the ceiling at 20% above and the floor at 10% below the benchmark.

The interest-rate controls were the legacy of economic planning. The deregulations processed slowly in China after the 1984 central bank reforms. No official document (from the PBC or other authority) has
ever stated the rationales on interest-rate controls in China. There are two conjectures in the extant literature. One argument is that through interest-rate controls, the Chinese government wanted to keep interest rates low to stimulate investment. As argued in Song and Xiong (2018: 5-7), “the Chinese government developed the financial system with a mission to finance China’s economic reform” and “the financial system served mainly to support the inefficient state sector rather than funding the booming private sector.”

The second possible explanation for the interest-rate controls is that the central bank uses these controls in an attempt to ensure banks’ profits by limiting the competition among banks for deposits. This view is widely used to explain U.S. Regulation Q. It was believed that “competition for deposits not only reduced bank profits by raising interest expenses but also might cause banks to acquire riskier assets with higher expected returns in attempts to limit the erosion of their profits” (Gilbert 1986: 23). Analogously, this argument applies to controls on bank loan rates as competition tends to reduce interest rates charged on loans and erodes bank profits. Again, to offset the shrinkage of bank profits, banks might take some extra risks somewhere else. Indeed, studies on the competition and stability nexus show that there is a trade-off: An intensification of competition reduces bank profits, encouraging banks to take more risks (see, e.g., Keeley 1990; Hellmann et al. 2000; Jiang et al. 2017).

It is plausible that out of financial stability considerations, the PBC guarantees banks’ profits through the regulations on retail interest rates and leaving a fixed interest-rate spread. Also, one of the Chinese characteristics is that banks in China, especially big state-owned banks, are required to stimulate investment and issue loans in support of the government industry development plan. They are not free to decide all their investment projects. In return, the government uses other distortions, for example, the interest-rate controls, to guarantee banks’ profits (see, e.g., Lardy 2008; Song & Xiong 2018).

In sum, two possible explanations for interest-rate controls are the PBC considerations to keep the capital cost low to stimulate investment on the one hand and on the other hand, to ensure banks’ profits. Indeed, interest-rate controls could tally with these two objectives over the pre-2012 period, when Chinese households did not have many other alternative investment choices, and hence it was not necessary for banks to pay high deposit interest rates to mobilize savings. In the post-2012 period when the rapid development in deposit substitutes (such as WMPs and MMFs) drove deposits out of the regulated commercial banks, which resulted in deteriorating bank profits (it will be elaborated in Section 3). Starting from 2012, the PBC accelerated deregulation with a series of actions. The final control was abolished in 2015.

**The bindingness of interest-rate control:** The next question is whether these interest-rate controls were binding. A binding lending-rate floor refers to the case when the regulated floor is above the market equilibrium rate, while a binding deposit-rate ceiling refers to the one that the ceiling is below the market
equilibrium rate. Only binding regulated prices would bring about distortions. This question is explored in two ways.

First, the regulated retail rates are compared with the market interest rate. Fig. 1 plots two retail rates as well as the money market interest rate (CHIBOR, a trade-weighted monthly average of interbank offering rate) over the 2000-2017 period, with the benchmark deposit rate and the CHIBOR both of three-month maturity and the benchmark lending rate of one-year maturity. The market interest rate was much more volatile. Throughout the period, the money market rate was constantly above the benchmark deposit rate, except five months in 2011 (2011M02-2011M06). With these two markets segmented (i.e., individual investors do not have access to the interbank money market), it is somehow not surprising to observe persistent divergence of these two interest rates. On the other hand, Chinese savers would have earned higher returns on deposits if the deposit rate were market-determined. It is the ceiling regulation that has kept the deposit rate low, suggesting a binding deposit-rate ceiling over time.

Figure 1. Two regulated retail interest rates and the money market rate, 2000-2017

Another regulated interest rate, the benchmark lending rate, remained above the CHIBOR in the pre-2017 period (except for three months around the 2013-2014 turning point). Then in 2017 after an upswing of the money market rate, the lending rate turned out lower than the CHIBOR, indicating relatively cheap bank lending over the year. This comparison is not sufficient to conclude whether the lending rate floor was binding as the money market was not strictly comparable to the bank lending.

Second, I check how banks lend and pay their depositors. Unfortunately, the data about the interest rate on each loan are not publicly available. However, from 2004Q2 onwards, the PBC publishes the data on
the shares of the total loans issued at / below / above the benchmark on a monthly basis, as presented in Fig. 2. The share of the total loans issued at the benchmark did not fluctuate much before 2012, lying around 25-30% from 2004-2012. Afterward, it declined steadily to below 20% by the end of 2014. Another two shares, measuring the total loans issued below / above the benchmark, were much more volatile. They comoved closely, while in the opposite directions, with the correlation coefficient of -0.91. Most of the time, the majority of the total loans were issued at the rates above the benchmark. At the highest, such loans accounted for more than 70% of the total in several months of 2012 and 2014. On the contrary, most of time the loans issued below the benchmark accounted for the smallest share, with a sample mean of 19%. At the lowest, this share was around 5% in early 2012 and remained below 10% in 2014. During the period of 2004-2010, about 25-30% of the total bank loans were issued at the floor lending rate (i.e., 90% of the benchmark). The existence of this share throughout the whole sample period suggests that to some extent, the lending-rate floor was binding (see also Xu et al. 2016).

**Figure 2. Shares of the total loans issued at /below /above the benchmark, 2004M04-2017M12**

The figure marks the dates when the actions were taken to deregulate the lending rate (with vertical black solid lines) and the deposit rate (with vertical violet dashed lines). There seems to be no pattern suggesting any structural break associated with these vertical lines. Rather, a rising share of the loans issued above the benchmark seems to be more likely at times when the economy shows high uncertainty, for example, in 2012 and 2014. Plausibly, the driving force of these share fluctuations is economic conditions and banks’ perceptions about the risk, rather than the deregulation timeline.
Neither are the data on the deposit rates publicly available. However, the discussions in the PBC’s *China Monetary Policy Report* shed some light on the question of whether the deposit-rate ceiling was binding. For example, it is pointed out that during the period of 2004-2008, “financial institutions often offered the ceiling deposit rate to depositors”; “since 2009, (...) some commercial banks have offered rates lower than the benchmark rate” (*China Monetary Policy Report* 2009Q2: 13). Moreover, banks’ initial reactions to the policy announcements of the changes in the deposit-ceiling shed some light on the bindingness of the control. For example, following the announcement on 8 June 2012, all the small-sized banks and some medium-sized banks immediately raised deposit-rates of all maturities to the new ceiling, while large banks increased various deposit rates, but not all of them to the new ceiling (*China Monetary Policy Report* 2012Q2: 10-11). Similarly, after the adjustment in November 2014 and March 2015, banks responded but differently (*China Monetary Policy Report* 2014Q4; 2015Q1). All these suggest that over the early period the deposit-rate ceiling was binding on various banks, while it continued to be binding over the later period, at least to the extent on certain deposit products or those less competitive small- and medium-sized banks (see also He & Wang 2012; Ma et al. 2013).7

3. Interest-rate controls and bank profits

*Graphic analysis:* As mentioned above, the arguments for the interest-rate controls are based on the belief that imposing controls could increase bank profits and hence financial stability. In this part, I show the effects of interest-rate controls on bank profits, as Gilbert (1986) does in assessing the U.S. Regulation Q. Then Gilbert’s framework is extended to show the effects of the interest-rate ceiling on financial stability, highlighting that the PBC has been forced to speed up the deregulation in 2015 due to the financial innovations, for example, WMPs and MMFs.

Fig. 3 is adapted from Gilbert (1986), showing the supply and demand for loans and deposits in the banking system. The total amount of loans available in the banking system (loan supply $S^l$) is assumed to equal the amount of deposits at each level of deposits. The solid dark red line, labeled as $D^l$, is the investors’ demand curve for loans. The downward-sloping dashed line, labeled as $D^d$, is the banks’ demand curve for deposits.8 The upward-sloping dashed line, labeled as $S^d$, is the depositors’ supply curve of deposits to banks; it indicates the interest rates that banks must pay to attract various amounts of deposits.

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7 Overall, the weighted average deposit rate of the whole banking system is within the upper limit. For example, it was 1.17 times of the benchmark (with the upper bound of 1.2 times) by the end of 2014 (*China Monetary Policy Report* 2014Q4:16); it remained below the upper limit of 1.3 times the benchmark in March 2015 (*China Monetary Policy Report* 2015Q1:24). The PBC interprets the divergent responses of banks to the adjustments of the benchmark deposit rate as the increase of the pricing capabilities (*China Monetary Policy Report* 2014Q4; 2015Q1).  
8 As argued in Gilbert (1986), this demand for deposits is based on the economy’s demand for loans. For each amount of loans demanded, the interest rate that banks are willing to pay on deposits is less than the interest rate they can receive on loans; the difference determines bank profits.
With no interest rate controls, banks will pay the interest rate OA on deposits and charge OE on loans. The level of deposits and loans will equal $Q_0$. The profits of the banking system equal to ABCE. Suppose the government considers these profits to be too small for a safe and sound banking system and sets a ceiling interest rate on the deposits of OF that is binding, below the rate OA that banks would pay with no ceiling rate in effect. With that ceiling rate, the quantity of deposits that banks can attract falls to $Q_1$. With a lower quantity level of deposits available to lend, the interest rate on loans rises to OK. So does the interest rate differential that banks earn from issuing loans rise to EF. The profits of the banking system shift from ABCE to FGHK.\(^9\)

The impact of imposing the ceiling deposit interest rate on bank profit is ambiguous as this control has both quantity (smaller) and price (larger) effects. The difference between profits with the ceiling rate in effect (FGHK) and profits with no ceiling rate (ABCE) depends on the shapes of the demand curve for loans ($D^d$) and the supply curve of deposits ($S^d$). With the slopes of these two curves sufficiently steep, the banking system’s profits would be higher with a binding ceiling rate on deposits in effect. This might be the case in China in the 1990s and 2000s when both the investors’ demand for loans and the depositors’ supply of deposits were less elastic with respect to the interest rate: Chinese investors and depositors did

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\(^9\) The same figure can be used to analyze the effects of a binding floor on the lending interest rate that are indeed parallel to those of a binding deposit interest-rate ceiling. Suppose the government sets a floor interest rate on the loans (OK) that is above the lending interest rate (OE) at which banks would be willing to make loans with no floor rate in effect. With this floor rate, the quantity of loans demanded in this economy is $Q_1$. With this lower level of loans demanded, the interest rate that banks pay to attract deposits falls to OF. Again, the bank profits shift from ABCE to FGHK, the same as what is obtained from introducing a binding deposit interest-rate ceiling.

Given the similar effects of both controls, I will focus on the analysis of a deposit rate ceiling in the paper.
not have many other alternatives rather than bank loans for financing their projects and bank deposits for investing their savings. I extend the above analysis to incorporate substitutes of bank loans, e.g., WMPs or MMFs, while assuming that a binding deposit interest-rate ceiling, OF, is in effect. In so doing, the depositors’ supply curve of deposits is modeled to depend on the growth of WMPs, labeled as $S^d (WMP)$. WMPs yield a higher return than the deposit interest rate and are regarded as close substitutes to bank deposits. WMPs have grown fast (it will be elaborated in Section 4), for example, from $WMP_0$ to $WMP_1$. Some, but not all, depositors will shift a part of their savings from deposits to WMPs. This is reflected in a shift of the deposits supply curve from $S^d (WMP_0)$, which is assumed to be the same as the original $S^d$, to the left to $S^d (WMP_1)$. With less supply of deposits, the quantity of deposits that banks can attract at the ceiling rate level of OF falls even further to $Q_2$. At this lower quantity level of deposits to lend, the interest rate on loans rises to OP.

The bank profits are measured with the area of FMNP. Compared to the bank profits obtained in two other scenarios (the case with no ceiling rate, measured with ABCE, and the case with the ceiling rate, measured with FGHK), it is very likely that the decline of deposits supply as a result of fast developments of substitutes for bank deposits (in the form of WMPs and MMFs that offer higher interest rates) will lead to a decrease in bank profits, as measured with FMNP.

**Reported bank profits:** Following this graphic analysis, I present the reported bank profits from the PBC’s *Almanac of China Finance and Banking*, which are available at the bank group level from 2007 onwards.\(^{10}\) Fig. 4 shows bank net profits (after tax) on an annual basis over the 2007-2017 period, scaled as the profit-to-total-asset ratio (known as return on assets, hereafter as ROA). Three groups of banks are considered: big commercial banks (BCCs), joint-stock commercial banks (JSCBs), and urban commercial banks (UCCs).\(^{11}\) The interest spread between the benchmark loan rate and the deposit rate (both of one-year maturity), presented in the figure as well, dropped monotonically over the period (from 3.46% to 2.85% with an average of about 3%).\(^ {12}\) Total bank net profits were substantial, about RMB 2.2 trillion in 2017 according to *2018 Almanac of China Finance and Banking*, which accounted for about 2.7% of the 2017 annual GDP. Three ROA curves, which measure the profit that each unit of asset creates, indicate that the ROA of big banks (BCCs) was clearly higher than that of medium- and small-sized commercial banks (JSCBs and UCCs). Despite this difference, all these three ROAs showed a similar cyclical pattern, especially over the early sample period. It implies that the interest-rate spread is not the only factor that explains bank profits. Plausibly, due to the 2007-2009 Global Financial Crisis, the ROA of Chinese banks

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\(^{10}\) The profit data for some large- and medium-sized banks are available since the mid-1990s. Yet, many of these banks have experienced structural reforms in the early and middle 2000s, which might result in a structural break in the data.

\(^{11}\) BCCs include 5 big state-owned commercial banks (Industrial & Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, and Bank of Communications), while JSCBs include 12 medium-sized joint-stock commercial banks and UCCs include more than 100 small-sized urban commercial banks.

\(^{12}\) The interest spread between the one-year lending rate and the demand deposit rate was even larger (with the mean of 5.1%, ranging from 6.75% in the early period to 4% in 2017).
was more volatile over this period. Then, ever since 2011 the ROA declined continuously as predicted by the interest-rate spread.

**Figure 4. Bank profits (ROAs) and the interest rate spread, 2007-2017**

![Graph showing bank profits (ROAs) and the interest rate spread, 2007-2017.](image)

**Note:** ROAs are calculated as the ratio of net profits over total assets. BCBs stands for big commercial banks, JSCBs for joint-stock commercial banks, and UCBs for urban commercial banks.

Source: The data on net profits and total assets are collected from the PBC’s *Almanac of China Finance and Banking* (2008-2018).

In short, bank profits in China were guaranteed by interest-rate regulation that imposed a floor for the loan rate and a ceiling for the deposit rate, which left a spread around 3-5 percentage points (see, e.g., Song & Xiong 2018). Yet, the unit profit (measured with the ROA) was continuously declining ever since 2011. This does not accord with the PBC’s intention of retaining interest-rate controls to guarantee bank profits, but consistent with what the simple supply-demand framework in Fig. 3 predicts. Of course, one explanation for the declining unit profit was that the loan-deposit interest spread was narrowed over time, as shown in Fig. 4. Another possible explanation might be that the deposits that banks have attracted decreased, as predicted in Fig. 3. Indeed, the share of bank deposits in the balance sheet dropped from 0.93 in 2000 to 0.85 in 2017. This implies a rising funding cost facing banks, given that deposits at lower-than-market regulated rates were a cheap funding source.

4. **Distortionary effects of interest-rate controls**

*Disintermediation and a rising shadow banking system:* As Fig. 1 shows, the deposit rate has constantly been lying below the market interest rate of the same maturity over time, indicating that bank deposits earn lower-than-market returns. One of possible consequences of the binding deposit-rate ceiling is that it might drive deposits out of the regulated commercial banks and into close substitutes like WMPs and
MMFs. This process of the loss of deposits from the banking system is so-called disintermediation. To explore this disintermediation process over time, I compare the evolutions of financial products, including cash, bank deposits, WMPs, and MMFs, and present them in Fig. 5, all scaled by nominal GDP.

Figure 5. Financial products: cash, bank deposits, WMPs and MMPs, 2000-2017

![Image of graph showing financial products]

Note: This figure shows the shares of cash, the outstanding value of wealth management products of the banking sector, the outstanding value of money market funds, deposits as well as the deposits of the household sector with respect to nominal GDP over the time. Source: The nominal GDP data are from the NBS; the data on cash and deposits are collected from the PBC’s Summary of Sources and Uses of Credit Funds of Financial Institution (2000-2017); the data on the outstanding value of WMPs of the banking sector are collected from China Banking Regulatory Commission Annual Reports (2007-2012) and China Assets Management Products Market Report of the Banking Sector (2013-2017); the data on the outstanding value of MMFs are collected from monthly statistic tables (2012-2017) of funds management companies of the Asset Management Association of China (AMAC).

The competition for funding among banks led to the rise of WMPs around 2007, which are saving instruments, offering fixed rates of return but above the deposit rate ceiling. They are typically actively managed by banks, with other firms commonly used as ‘channels,’ but few are recorded on banks’ balance sheets. This led to rich shadow banking activities (see, e.g., Perry & Weltewitz 2015; Hachem & Song 2016; Song & Xiong 2018). The solid blue line in Fig. 5 plots the outstanding value of WMPs issued by the banking sector as percentage of GDP. It increased from 1.1% in 2007 to a peak of 39% in 2016, though this strong growth slowed down in 2017 with the share dropping to 36%.

Also, MMFs have seen fast developments since 2013 in China. For example, Yu’e Bao was established as online platform for deposit accounts in June 2013 by Alibaba. It corporates with Tian Hong, a money market fund (MMF), and sell the MMF products to retail investors at a time-varying interest rate premium over bank deposits. Since then, Yu’e Bao has gained huge popularity and has grown fast to the largest money market fund in the world, with its total asset under management blooming to RMB1.56 trillion by

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13 The first RMB-dominated WMP was issued in July 2004 by Everbright Bank, Shanghai.
the end of 2017 (Yu’e Bao Annual Report 2017). The red dash line in Fig. 5 plots the outstanding value of MMFs as percentage of GDP, which increased from 1% in 2012 to 8% in 2017.

However, this diversification of investment alternatives seems not to bring down the deposit-GDP ratio, as shown with the green dotted line in Fig. 5, which rose from 1.2 in 2000 to about 2 in 2017 due to the rapid wealth accumulation as a result of the high saving rate in China. The ratio of bank deposits of the household sector to GDP, presented in the black squared line in the figure, did not increase at any similar fast speed. Rather, the rise of this ratio was modest, from 0.65 to 0.78.

Indeed, a closer look at the allocation of the household financial assets over the 2004-2014 period, where the data are available, shown in Fig. 6, indicates that the share of the bank deposits dropped from 0.72 in 2004 to below 0.5 in 2014. In 2010, the household sector started to hold more WMPs and other investment vehicles, which were not specified in the data. The share of cash in the financial assets shrank over time, in both Fig. 5 and 6.

Figure 6. Allocation of the household financial assets, 2004-2014

![Figure 6. Allocation of the household financial assets, 2004-2014](image)

Source: Author’s calculation based on the data from Table 8-1 in Li et al. (2015: 97-98).

Apparently, some other sectors must have contributed to the large increase in bank deposits. Fig. 7 shows the decomposition of the total bank deposits over the 2000-2017 period. Indeed, the share of deposits by the household sector dropped from 0.52 to 0.39. Corporate deposits have increased along with the total bank deposits such that its share remained around 0.33-0.35; and over the 2007-2010 period, corporate deposits grew at an even higher rate such that its share reached to about 0.42-0.45. Two possible sources might account for this increase. First, a part of raised funds from issuing WMPs was held as deposits by the companies that got these funds. For example, this share was about 21% by the end of 2012 (China Banking Regulatory Commission Annual Report 2012: 37). Second, it is due to the increased bank deposits from money market fund management companies. Indeed, many of these companies held a large share of
their raised funds in bank deposits. For example, according to Annual Reports of Yu’e Bao, this share was 69.5%, 70.3% and 56.7% by the end of 2015, 2016 and 2017 respectively. Overall, the deposits from the non-banking financial institutions accounted for about 8.5%-9.5% of the total deposits in the recent three years when the PBC started to publish the data, as shown in the figure.

**Figure 7. Composition of the total bank deposits, 2000-2017**

A part of deposits that are attracted away from the household sector flow back to the banks’ balance sheet as the deposits from other sectors, which partially neutralizes the disintermediation effects of WMPs and MMFs. However, these processes do have scattered quite an amount of bank deposits out into the shadow banking. The rising shadow banking has evoked the PBC’s concerns about accumulated financial instability, as pointed out by the PBC’s Governor, YI Gang, in April 2018 (Caixin 2018). 14

Meanwhile, the change in the deposit composition implies shrinking bank profits, which might encourage banks to take more risks and result in a build-up of financial instability. Indeed, large institution depositors, such as Yu’e Bao, are able to negotiate the deposit at a higher rate, very likely close to the ceiling, compared to those small household depositors. This leads to a rise in the costs for banks and further erodes the bank profits. To real economy, the prolonged fund chain will also lead to an increase in the capital cost, as YI Gang pointed out (Caixin 2018).

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14 For example, one concern with the WMPs is implicit repayment guarantee, known also as rigid repayment, as pointed out in the “Guidelines on Standardizing Asset Management Businesses of Financial Institutions” (issued on April 27 2018). That is, there has been no default case and banks pay the promised returns even in case of an investment loss of some WMP projects, but with the funds raised from other sources. The increased indebtedness will encourage banks to take more risks. At the aggregate level, this raising funds from other sources will result in higher interconnectedness of financial institutions, which will threaten the stability of the whole financial system.

It is worth noting that the overall size of the shadow banking remains modest in China and its rapid development started to slow down in 2016 and 2017 because of various tightening regulations, such as incorporating shadow banking activities into the PBC’s macroprudential policy framework and imposing required capital on banks for such activities (as specified in the new Guidelines) (see, e.g., Song & Xiong 2018).
**Financial repression in China:** Financial repression, defined as the low and even negative real return on deposits, is most clearly evident in China from the point of view of households (Lardy 2008). The real return on deposits is measured as the difference between the nominal interest rate that households receive on deposits and the rate of consumer price inflation. Fig. 8 presents the annualized rate of consumer price inflation on a monthly basis over the 2000-2017 period, together with two benchmark deposit rates and the benchmark one-year loan rate. Chinese households had received positive real return on savings deposits till the mid-2003 when inflation remained moderate or even negative. Since then, inflation has risen, but the rise of deposit rates has been modest, which led to negative real returns on deposits. The interest rate on demand deposits has been lying below inflation since mid-2003, except the 2009 deflation period. Meanwhile, the real interest returns on the short- and medium-term savings deposits (from example, from 3 months to 3 years) were negative for about half of the time since mid-2003, as highlighted in grey shaded areas in Fig. 8 where the referred 1-year benchmark deposit rate was lying below inflation.

**Figure 8. Inflation, the benchmark deposit and lending rates, 2000-2017**

Note: The grey shaded areas mark four periods when the interest rate on one-year savings deposits was lying below inflation: 2003M10-2004M12, 2007M01-2008M11, 2010M01-2012M02, and 2015M11-2017M02.
Source: Data from the NBS and the PBC.

I then follow Lardy (2008) to quantify the financial repression facing households by the decline in the real return on savings deposits over the post-2002 period by estimating how much higher household interest income would have been if households had received the same real returns on their net deposits as in 2002. The results of this exercise, on a yearly basis, are reported in Table 3. Chinese households are net savers with the net deposits larger than zero, defined as the difference between household deposits and

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15 The year-over-year CPI inflation rate from the NBS is used.
16 This estimate, far from precise but simple, sheds some light on the magnitudes of financial repression/financial benefits in China. Using this method, Lardy (2008) estimates and reports the financial repression in the first quarter of 2008.
bank loans (both as averages throughout the year, using the monthly data from the PBC’s *Summary of Sources and Uses of Credit Funds of Financial Institution*). The real return equals to the average of a nominal interest rate over the year minus the CPI inflation rate, which is then compared with the corresponding real return in 2002, denoted as $\Delta r$.

### Table 3. Household financial repression and corporate financial benefits, 2003-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Deposits (¥ billion)</th>
<th>Share of Demand Deposits</th>
<th>Share of Time Deposits</th>
<th>Financial Repression</th>
<th>Net Bank Loans (¥ billion)</th>
<th>Financial Benefits</th>
<th>% GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>7111.84</td>
<td>0.33</td>
<td>0.67</td>
<td>0.67</td>
<td>2.02</td>
<td>143.84</td>
<td>1.05</td>
</tr>
<tr>
<td>2004</td>
<td>8332.14</td>
<td>0.35</td>
<td>0.65</td>
<td>0.66</td>
<td>4.66</td>
<td>389.81</td>
<td>2.41</td>
</tr>
<tr>
<td>2005</td>
<td>9896.64</td>
<td>0.34</td>
<td>0.66</td>
<td>0.65</td>
<td>2.35</td>
<td>241.91</td>
<td>1.29</td>
</tr>
<tr>
<td>2006</td>
<td>11668.34</td>
<td>0.35</td>
<td>0.65</td>
<td>0.65</td>
<td>1.94</td>
<td>241.89</td>
<td>1.10</td>
</tr>
<tr>
<td>2007</td>
<td>12567.49</td>
<td>0.37</td>
<td>0.63</td>
<td>0.63</td>
<td>4.32</td>
<td>601.60</td>
<td>2.23</td>
</tr>
<tr>
<td>2008</td>
<td>14503.41</td>
<td>0.36</td>
<td>0.64</td>
<td>0.64</td>
<td>4.90</td>
<td>808.92</td>
<td>2.53</td>
</tr>
<tr>
<td>2009</td>
<td>18285.37</td>
<td>0.36</td>
<td>0.64</td>
<td>0.64</td>
<td>-0.15</td>
<td>14.33</td>
<td>0.04</td>
</tr>
<tr>
<td>2010</td>
<td>18950.32</td>
<td>0.38</td>
<td>0.62</td>
<td>0.62</td>
<td>3.77</td>
<td>766.19</td>
<td>1.86</td>
</tr>
<tr>
<td>2011</td>
<td>20207.85</td>
<td>0.39</td>
<td>0.61</td>
<td>0.61</td>
<td>4.91</td>
<td>1155.37</td>
<td>2.28</td>
</tr>
<tr>
<td>2012</td>
<td>23607.10</td>
<td>0.38</td>
<td>0.62</td>
<td>0.62</td>
<td>2.17</td>
<td>652.08</td>
<td>1.21</td>
</tr>
<tr>
<td>2013</td>
<td>25952.74</td>
<td>0.38</td>
<td>0.62</td>
<td>0.62</td>
<td>2.40</td>
<td>760.57</td>
<td>1.28</td>
</tr>
<tr>
<td>2014</td>
<td>27291.16</td>
<td>0.37</td>
<td>0.61</td>
<td>0.61</td>
<td>1.84</td>
<td>638.19</td>
<td>0.99</td>
</tr>
<tr>
<td>2015</td>
<td>28006.38</td>
<td>0.36</td>
<td>0.60</td>
<td>0.60</td>
<td>2.14</td>
<td>644.38</td>
<td>0.49</td>
</tr>
<tr>
<td>2016</td>
<td>27808.27</td>
<td>0.38</td>
<td>0.62</td>
<td>0.62</td>
<td>3.30</td>
<td>906.88</td>
<td>0.22</td>
</tr>
<tr>
<td>2017</td>
<td>25992.33</td>
<td>0.38</td>
<td>0.62</td>
<td>0.62</td>
<td>2.90</td>
<td>743.51</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Note: $\Delta r_{DD}^t = r_{t}^{DD} - r_{t-1}^{DD}$, $\Delta r_{1YD}^t = r_{t}^{1YD} - r_{t-1}^{1YD}$, $\Delta r_{1YL}^t = r_{t}^{1YL} - r_{t-1}^{1YL}$, where $t = 2003, 2004, ..., 2002 + 1.54, r_{2002} = 2.80$ and $r_{2002} = 6.16$.

Source: Author’s calculation with the data from the NBS and the PBC.

The calculated financial repression is positive, suggesting for the existence of financial repression throughout the post-2002 period if the real returns in 2002 are taken as the benchmark. In general (except the deflation year 2009), this financial repression was significant, accounting for more than one percent of China’s GDP. It turned out enormous in the years of negative real rates on short- and medium-term time deposits, amounting to more than two percent of the total GDP, which was, for example, 2.3% (equivalent RMB 1 trillion) in 2011 and 2.5% (equivalent RMB 808 billion) in 2008.

The next question is who benefited from this large implicit tax on household? Chinese corporations might be the major beneficiary of financial repression given that the real interest rate on loans has fallen with a rising CPI inflation rate since 2002 (except the 2009 deflation year). For example, the 1-year benchmark

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17 Household deposits are composed of demand and time deposits. The term of time deposits runs from three months to five years. This calculation follows Lardy (2008), by assuming that all time deposits were one-year deposits, which Lardy argues is a good proxy given the term structure of interest rates on time deposits and the mix of these deposits.
nominal lending rate, presented in Fig. 8, was not significantly different from inflation around the 2004 and 2011 inflation hikes; also, this lending rate was below inflation over the 2008 high-inflation months. In China, most of the bank loans go to corporations: corporate bank loans accounted for more than 80% in the 2000s; this share started to fall in 2010 and dropped to 69% and 66% in 2016 and 2017, respectively. Corporations are net borrowers. The net benefits to corporations are quantified as how much higher corporate interest costs would have been if they had paid the same real lending rates on their net borrowing as in 2002.

The calculated corporate net benefits over the post-2002 period are listed in Table 3. In most cases, they accounted for about 0.65% to 1% of China’s GDP. It suggests that about half of household financial repression went to corporations, with the rest to banks and the government. Repressing the household sector has resulted in a tilted economic growth model with low consumption. After all, this distorted interest rate structure in China is a significant obstacle to China’s sustainable economic growth. Despite various problems, Chinese financial markets have been maintained stable so far, mainly due to the Chinese government’s guarantee to be the savior of last resort (see, e.g., Song & Xiong 2018). Interest rates on both deposits and bank loans were under strict controls to guarantee low-lending rates to support industry policies as well as guarantee a large interest spread to ensure bank profits. The distortionary effects of these controls are threefold. First, binding interest-rate controls feedbacked as they triggered the development of deposit substitutes that banks use to circumvent the restrictions imposed by the controls and compete for funding. Second, these substitutes do not show up in bank balance sheet. A rising shadow banking system has evoked the PBC’s concerns about financial stability. Third, Chinese households are financially repressed, which undermines consumption and dampens the long-run economic growth path.

5. A new interest-rate corridor

Though the last control on the interest rate was lifted off in 2015, it is widely believed that the interest rate in China, on both deposits and loans, is not market-determined. Rather, they are still subject to the PBC’s window guidance and other pricing mechanism guidance (see, e.g., Chen et al. 2017; Song & Xiong 2018). For example, upon the abandonment of the deposit ceiling in 2015, the PBC announced that out of the consideration of path dependence, it would continue publishing the benchmark interest rates (both on deposits and loans) over a period of time for banks and the market to refer to (China Monetary Policy Report 2015Q3: 17; Yi 2015). Banks are believed to follow them closely. Meanwhile, a financial institution self-regulatory pricing mechanism for market interest rates and a loan prime rate (LPR) centralized quote and release mechanism was established in 2013 (China Monetary Policy Report 2013Q3: 18). For example, to ensure the functioning of state-owned banks, a large amount of nonperforming loans on their balance sheet were either written off or moved to asset management companies around 2003-2004.
As a further step towards interest-rate liberalization, the PBC announced a new LPR formation mechanism in August 2019 and stipulated Chinese banks to use the LPR as the pricing reference for bank lending. The LPR is based on 18 commercial banks’ quotations, updated every month, which in turn are based on the one-year MLF rate.  

International experience has shown that interest-rate liberalization usually progresses in tandem with the gradual transformation of the monetary policy framework. In the 1970s and 1980s, along with the rapid progress in interest-rate liberalization in the major economies, their monetary policy frameworks gradually moved from quantity-based to price-based. The Chinese government has also expressed its resolution in the 12th Five-Year Plan for Financial Sector Development and Reform as well as the 13th Five-Year Plan for Economic and Social Development to shift its monetary operation framework from quantity-oriented management to price-oriented management. In particular, the 12th Plan emphasizes to “strengthen the role of open market operations in guiding money-market interest rates” (China Monetary Policy Report 2012-3: 18), and the 13th Plan emphasizes to build a target interest rate and interest-rate corridor system (China Monetary Policy Report 2018-1: 23).

The PBC is building its interest-rate corridor system. In 2015, the PBC started to state that it would “explore an interest-rate corridor mechanism, enhance the interest-rate adjustment capability, and improve the mechanism for the transmission of central-bank policy rates to the financial market and the real economy” (China Monetary Policy Report 2015Q4: 65). At the ceiling of the corridor is the interest rate of the standing lending facility (SLF) that was introduced in early 2013, at the floor is the interest rate that the PBC pays on banks’ excess reserves (IOER), and, most important, there would be a market-determined interest rate above the floor and below the ceiling. The SLF rate works as the ceiling as it allows banks to obtain overnight liquidity at this rate such that banks will stop borrowing in the money market if the money market rate exceeds the SLF rate. The rate on the excess reserves works as the floor as it allows banks to make overnight deposits with the PBC such that no bank will lend in the money market at a rate below that paid on excess reserves. The PBC’s open market operations would have impact on the supply of reserves and would be transmitted to the money market interest rate that is market-determined but lies within the upper and lower bounds. However, the PBC has never clearly announced which money market interest rate that it is targeting. Neither has it ever announced the explicit numeric value of the target rate.

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20 The 12th (13th) five-year plan covers the 2010-2015 (2016-2020) period.

21 In addition to the SLF, the central bank has other liquidity injection tools with longer tenors of 3-month, 6-month and 1-year, namely the Medium-term Lending Facility (MLF) that was introduced in September 2014. However, a preliminary assessment done in Sun (2018a) indicates that the immediate effects of changes in these two central bank lending rates on market interest rates are limited.

In the meantime, the PBC conducts open market operations (OMO), mainly including repo and reverse repo transactions, to influence liquidity. In 2016, the PBC increased the frequency of OMO to a daily-basis from two days per week previously.
There are some guesses about the PBC’s candidates of the money market target rate, among which the interbank pledged repo rate is on the top of the list. This pledged repo rate is available as transaction-weighted averages on a daily basis. The argument in favor of it is that it applies to bank-to-bank transactions only while other repo rates apply to the transactions between banks and non-banking financial institutions in the money market. It is desirable for the PBC to target a policy rate purely for bank-to-bank transactions (see BBVA 2016, 2017).

Fig. 9 presents this interbank pledged repo rate, the CHIBOR and the SLF rate (all of the 1-day maturity), together with the interest rate on excess reserves on a daily basis, for the 2015M11-2018M10 period. The CHIBOR, also transaction-based, differs from the repo in that it is not collateralized. It is another important interbank interest rate that the PBC refers to. The interest rate corridor was 203 basis points in November 2015. Accompanying two rises in the ceiling SLF rate in March 2017, the corridor has been widened to 238 and eventually 258 basis points. This corridor was maintained until March 2018, when the PBC raised the SLF rate again, which widened the corridor to its present width of 268 basis points. The corridor appeared to be uneven, with the floor IOER remained constant at 0.72%, far below the overnight rates, and the ceiling SLF rate quite often lying close to the overnight rates. These two overnight rates were volatile, but most of the time they have been effectively confined to the corridor, with several occasional exceptions when they, in particular, the pledged repo rate, have spiked above the SLF rate.

This preliminary assessment of the corridor bounds is encouraging. However, when the PBC moves formally towards the corridor operating system, it needs to announce which interest rate it is explicitly targeting and its intended numeric value in order to effectively guide markets. For example, the Fed abolished the deposit ceiling (Regulation Q) in 1984, but has adopted procedural changes and become more open and transparent only in the 1990s, when it began to announce its intention to change the funds rate target on the day of its decision in 1994 and started to include a numeric value of the intended funds rate in each directive in 1997. Studies suggest that such greater transparency of monetary policy has contributed to the improved policy predictability and hence enforced monetary policy transmission to financial markets (see, e.g., Guthrie & Wright 2000; Kuttner 2001; Poole et al. 2002; Bernanke & Kuttner 2005). On the other hand, the international experience, e.g., of the ECB and the Risksbank, has shown that

22 Under an (outright) repo transaction the ownership of collateral is transferred to the cash lender for the length of the transaction. By contrast, under a pledged repo agreement, ownership of the collateral remains with the cash borrower but is pledged to the lender such that it cannot be used by the borrower for any other purpose until the cash principal and interest is returned. Source: http://www.rba.gov.au/publications/bulletin/2017/jun/pdf/bu-0617-9-the-chinese-interbank-repo-market.pdf.
23 It differs from the SHIBOR, which is quote-based, analogous to the LIBOR, and was introduced in January 2007 in China.
24 These occasional spikes include five cases for the pledged repo rate (Jan 18-19 2017, Oct 31 2017, Dec 29 2017, Mar 30 2018 as well as Apr 23-24 2018) and one case for the CHIBOR (Sep 30 2017).

The explanation for such a porous ceiling in the literature is stigma concerns that borrowing from the central bank could signal that the borrowing institution is financially distressed (see, e.g., Kahn 2010). Meanwhile, these stigma concerns could be moderated if the central bank takes actions to guide banks to view such a lending facility as the one without stigma and provided for sound institutions.
the effective interest rate corridor system, supported by a target interest rate, can well moderate deviations of the money market rate from the target (Bowman et al. 2010; Kahn 2010).

**Figure 9. The SLF rate and the money market interest rates, 2015M11-2018M10**

Source: Data from the PBC and China Foreign Exchange Trade System (CFETS).

6. **Conclusions**

This paper presents a detailed review of the retail interest-rate-control deregulation in China over the 1993-2015 period. Three distortionary effects of these controls are examined and quantified, including disintermediation, a rising shadow banking system, and financial repression. The paper ends with a preliminary assessment of the PBC’s new replacement operating framework and finds that this new interest-rate corridor system is encouraging with its bounds being effective most of the time. However, this system calls for more transparency and greater clearness about the PBC’s explicit target.
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Reply to the referee report

Thanks for the referee’s suggestions. Following them, I revised the paper. Besides that, I shortened the graphic analysis about the bank profits (based on Gilbert 1986), by presenting only one graph (Fig. 3 on Page 10). Also, I updated the discussion about the LPR (Loan Prime Rate) in the paper (on Page 19) according to the latest LPR reform in this August.

The detailed replies to each comment (highlighted in light grey) are as follows.

1. My main concern is that that paper makes a marginal contribution to the existing literature. The various rationales on China’s interest rate controls discussed in this paper are not new. The author could design some empirical framework to differentiate these rationales on interest rate controls, and perhaps identify the main rationale for different periods. That could be more interesting.

Reply: Thanks. Indeed, it would be great if one could identify the main rationale for different periods. However, these rationales are what the extant literature (including this paper) conjectures what the Chinese government wanted to achieve through the interest-rate controls, such as to stimulate investment and to ensure banks’ profits. As far as I know, there is no official document (from the PBC or other Chinese government authority) that has ever stated the reasons for interest-rate controls. Due to this reason, this paper only reviews and summarizes these possible rationales.

In practice, it is difficult to empirically differentiate these two objectives as argued on Page 6:

“One of the characteristics is that banks in China, especially big state-owned banks, are required to stimulate investment and issue loans in support of the government industry development plan. They are not free to decide all their investment projects. In return, the government uses other distortions, for example, the interest-rate controls, to guarantee banks’ profits (see, e.g., Lardy 2008; Song & Xiong 2018).”

I have tried to revise the discussions to make it clearer that these rationales are conjectures in the extant literature and they explain the pre-2012 period only (on Page 6). For example, “The interest-rate controls were the legacy of economic planning. The deregulations processed slowly in China after the 1984 central bank reforms. No official document (from the PBC or other authority) has ever stated the rationales on interest-rate controls in China. There are two conjectures in the extant literature. One argument is that through interest-rate controls, the Chinese government wanted to keep interest rates low to stimulate investment. …

“In sum, two possible explanations for interest-rate controls are the PBC considerations to keep
the capital cost low to stimulate investment on the one hand and on the other hand, to ensure banks’ profits. Indeed, interest-rate controls could tally with these two objectives over the pre-2012 period, when Chinese households did not have many other alternative investment choices, and hence it was not necessary for banks to pay high deposit interest rates to mobilize savings. In the post-2012 period when the rapid development in deposit substitutes (such as WMPs and MMFs) drove deposits out of the regulated commercial banks, which resulted in deteriorating bank profits (it will be elaborated in Section 3). Starting from 2012, the PBC accelerated deregulation with a series of actions. The final control was abolished in 2015.”

In addition to the review of rationales on interest-rate controls, this paper tries to contribute the existing literature with a clear deregulation time table and qualified assessments of the distortionary effects resultant from interest-rate controls.

2. The author argues that bank profits were guaranteed by interest rate regulations. I think this is plausible and perhaps reflects the reality, but the author only provides a very rough quantification to support this argument. It should not be difficult to give a more precise estimation on the impact of interest rate controls on bank profits, using bank-level dataset. I would suggest more elaborated quantification in this direction.

Reply: Thanks for the suggestion. I revised that part by deleting the estimate. I collected the reported bank profits from the PBC’s *Almanac of China Finance and Banking*, which are available at the bank group level from 2007 onwards. Figure 4 presents the bank profits (ROAs) of three different bank groups. The main conclusion is given on Page 12 as follows:

“Plausibly, due to the 2007-2009 Global Financial Crisis, the ROA of Chinese banks was more volatile over this period. Then, the ROA declined continuously ever since 2011 as predicted by the interest-rate spread.”

3. The author argues the rising share of shadow banking sector brings financial instability. This is plausible, but it should be noted that shadow banking sector also provides necessary funding to private sector, which is usually more productive and credit constrained. In this regard, shadow banking sector improves the efficiency of credit allocation, and therefore, whether this sector is detrimental to financial stability is ultimately an empirical question and deserves some rigorous empirical analysis.

Reply: Sorry for the confusion. Indeed, whether the shadow banking sector is detrimental to financial stability deserves rigorous empirical analysis, which is beyond the scope of this paper.
What I wanted to point out in this paper is that a rising shadow banking sector has evoked the PBC’s concerns about financial instability. I revised the discussion to make it clearer on Page 2 and wherever it is relevant.

“The rapid development in WMPs and MMFs drove deposits out of the regulated commercial banks, which resulted in deteriorating bank profits. A rising shadow banking system in China has evoked the PBC’s concerns about financial instability.”

Also in Footnote 2 on Page 2, I borrowed the above argument from the referee and pointed out that the shadow banking sector may improve the efficiency of credit allocation in China.

4. I would suggest the discussion on the interest rate corridor system to be reallocated to a separate section instead of nesting in the Conclusions and discussion section.

Reply: Thanks. I followed the suggestion and reallocated the discussion on the interest-rate corridor system in an extra Section (Section 5).

5. Finally, the Conclusions and discussion section should be more streamlined to focus on the contribution of the paper.

Reply: Thanks. I followed the suggestion and revised the Conclusion.