

Risks in China's Financial System

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Abstract

Motivated by growing concerns about the risks and instability of China's financial system, this article reviews several commonly perceived financial risks and discusses their roots in China's politico-economic institutions. We emphasize the need to evaluate these risks within China's unique economic and financial systems, in which the state and nonstate sectors coexist and the financial system serves as a key tool of the government to fund its economic policies. Overall, we argue that (a) a financial crisis is unlikely to happen in the near future and (b) the ultimate risk lies with China's economic growth, as a vicious circle of distortions in the financial system lowers the efficiency of capital allocation and economic growth and will eventually exacerbate financial risks in the long run.

1. INTRODUCTION

High leverage and soaring housing prices have caused wide concern about the risks and instability of China's financial system. **Figure 1** plots the ratio of the total outstanding debt (excluding central government debt) to GDP. By the end of 2015, the total debt stood above 20 trillion USD, with an annual growth rate of 20% since 2008. The debt-to-GDP ratio, which was slightly above 1.2 in 2008, skyrocketed to 2.1 in 2015. The high leverage is associated with enormous appreciation in housing prices. In 2003–2013, housing prices in real terms grew at an annual real rate of 13.1% in first-tier cities, 10.5% in second-tier cities, and 7.9% in third-tier cities (Fang et al. 2015). Despite recent strict measures to cool down the housing market, including a requirement of a 50–70% down payment on second homes and tight restrictions on third homes in big cities, housing prices continue to grow at a disturbingly fast pace. [Recent statistics from the National Bureau of Statistics of China (NBS) show that housing prices outgrew the Consumer Price Index by 12 percentage points in the 20 months from January 2016 to August 2017.]

There are also concerns about other sectors in the financial system. The 2015 stock market crash wiped out 3 trillion USD in share value. Despite the government's rescue plan to buy more than one trillion RMB worth of shares, the market has shown lackluster performance ever since. China had accumulated almost 4 trillion USD in foreign reserves by 2014. Capital flight has become a serious issue since then. Foreign reserves of 1 trillion USD were lost in 2015 and 2016. The net capital outflow amounted to 1.5 trillion USD in these two years. A mild but sudden depreciation of the Chinese yuan occurred in August 2015. In 2016, the Chinese yuan depreciated by 10% against the USD and by 15% against a basket of currencies weighted by trade. Although the exchange rate has been stabilized recently, this came at the cost of much tighter capital controls.

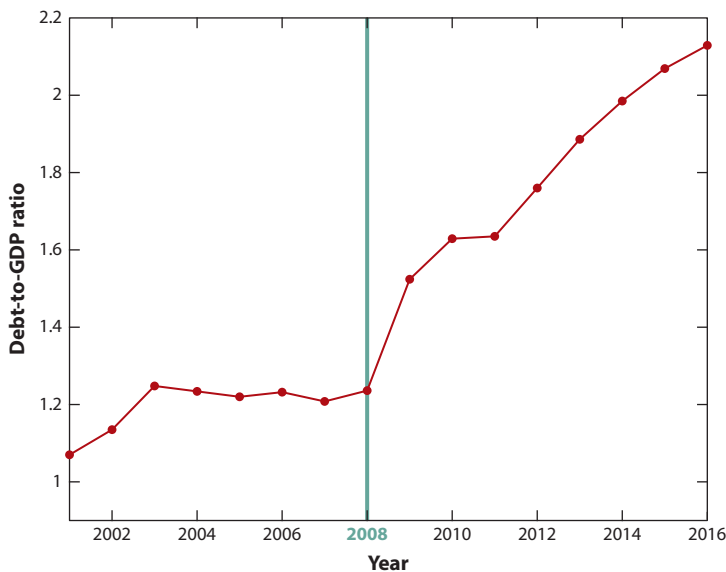


Figure 1

Debt-to-GDP ratio of China between 2000 and 2016. The outstanding debt is backed out from social financing statistics provided by the National Bureau of Statistics of China (NBS), which measures lending from the financial sector to the nonfinancial sector (including bank loans, corporate bonds, and trust and entrusted loans but excluding equity finance). Data from <http://data.stats.gov.cn/english/easyquery.htm?cn=C01>.

To systematically assess these financial risks, it is necessary to anchor the assessment on China’s unique economic structure that led to the current financial system. China started its economic transition in the late 1970s. A dual-track or gradualist approach has been adopted to tackle the fundamental issues inherited from the central planning regime, such as the soft budget constraint syndrome as described by Kornai (1979, 1980), that go hand in hand with a large but inefficient state sector. Although these problems have never been fully solved, they were greatly mitigated until 2008. Economic liberalization in the 1980s led to a booming private sector. The state sector was consolidated by the “grasp the large, let go of the small” policy started in the mid-1990s. Local government budgets were tightened by the 1994 tax sharing reform and the 1995 Budget Law. A set of new rules and regulations were introduced to make commercial banks more independent after the 1997 Asian financial crisis. Consequently, investment went up, resource allocation improved, and growth took off (see, e.g., Zhu 2012, Zilibotti 2017).

Unfortunately, the trend was reversed in the post-2008 period. China was hit hard by the 2008 world financial crisis: GDP growth decreased from 15% in 2007 to 10% in 2008 and then 8% in 2009 (see **Figure 2**). In response, the state launched a massive 4-trillion-yuan stimulus plan in late 2008. While the stimulus boosted investment (see **Figure 2**), it came at the cost of compromising some fiscal and financial institutional arrangements that were established to contain problems, such as soft budget constraints, that originated from the dual-track reform (Bai, Hsieh & Song 2016). As we elaborate below, the economic stimulus worsened the problem of soft budget constraints and reversed the flow of resources between the state and private sectors. Local government financing vehicles (LGFVs) and state-owned enterprises (SOEs) increased their investment but crowded out more efficient private investment. While aggregate investment did increase, misallocation worsened and growth slowed. **Figure 2** shows that investment and growth used to comove closely before 2008. After 2008, they started to depart from each other. The investment rate increased to

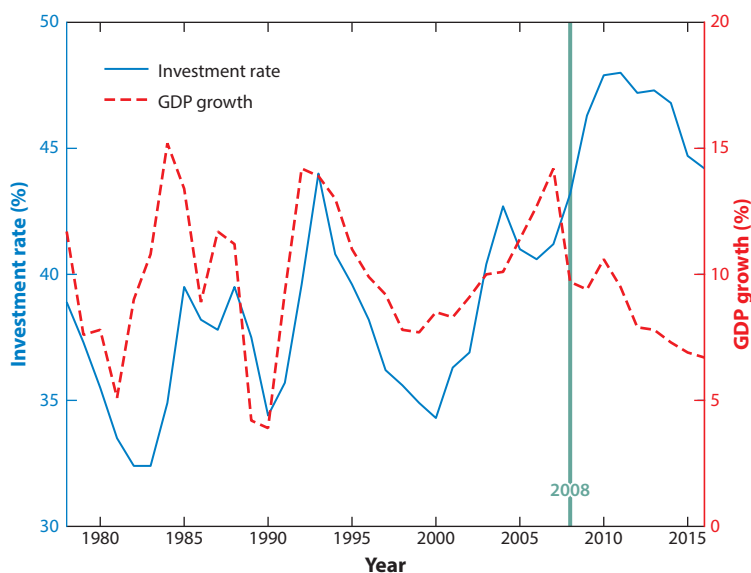


Figure 2

Investment rate and GDP growth in China from 1978 to 2016. Data from *China Statistical Yearbook 2017* (Nat. Bur. Stat. China 2017).

unprecedented levels above 45%, while the growth rate fell to 7%. Accordingly, aggregate total factor productivity (TFP) growth and returns to capital dropped dramatically (Bai & Zhang 2015).

Such a retreat reveals an important mission of China's financial system: It was largely developed to support the dual-track reform. State-owned commercial banks were reformed and guided to fund mostly SOEs. The state established the stock market in the early 1990s for two key purposes: (a) channeling private savings to SOEs and (b) diversifying risks in the state-owned banking sector (see, e.g., Wong 2006). The development of the bond market is no different. Zhou Xiaochuan, the governor of the People's Bank of China (PBC) since 2002, acknowledged that "administrative allocation of quotas [for bond issuance] was often used as a relief measure for financially distressed enterprises" (Zhou 2006, p. 8). The subsequent rapid development of the financial markets has never fixed this problem. In today's China, the state has loosened its direct controls of the financial system, and financial supports have been extended to private businesses. Nevertheless, credit allocation favors SOEs and other connected private firms through explicit or implicit guarantees. Moreover, a softer budget constraint would intensify favoritism which, in turn, would entrench the problem of soft budget constraints. This can be seen by the recent dramatic increase in the debt of local governments and listed firms, most of which are SOEs and connected private firms (Bai, Hsieh & Song 2016).

While the risks are concerning, we argue that they are unlikely to lead China to the same kind of financial crises experienced by Western countries. First, the Chinese state controls a lot of resources through local governments, the banking system, SOEs, and the connected private firms. Although SOEs remain less efficient than private firms, the restructuring since the late 1990s has greatly improved the viability of the state sector, which at that time was on the verge of collapse. Some SOEs even became highly profitable by establishing monopolistic positions in strategic industries. Second, Chinese households have high saving rates and low leverage levels. The economy runs a sizable trade surplus and does not have too much external debt. The financial sector is dominated by state-owned commercial banks. These provide flexibility for the state to steer through difficult times. Third, the rising leverage is mostly from state-owned banks to local governments, SOEs, and other connected private firms. This relationship makes it relatively easy for the state to resolve the coordination problem between creditors, as well as any externality in restructuring debt, and thus to avoid inefficient and costly bankruptcies that typically occur in financial crises.

That said, we argue that the distortions in the dual-track system may cause a vicious circle that leads to more policy distortions, lowers economic growth, and may lead to more financial risks in the long run. Recent firm data have shown signs of deteriorating allocation efficiency. Misallocation among Chinese industrial firms increased by 20% (Bai, Hsieh & Song 2016) from 2008 to 2013. Preliminary estimates from Brandt, Wang & Zhang (2017) also suggest a significant decline in TFP in most two-digit industrial sectors after 2007. The real estate boom across China also exacerbated the capital allocation inefficiency among industrial firms (Chen & Wen 2017). There is also a large policy risk. The financial system is becoming increasingly complex and cannot be handled with the traditional approach of "crossing the river by touching the stone." Policies and regulations can deliver unintended consequences, some of which may be entirely counterproductive (see, e.g., Hachem & Song 2016, 2017; Cai et al. 2017; Chen, Ren & Zha 2016; Chen, Petukhov & Wang 2017). Such risks are further exacerbated by speculation about government intervention (see, e.g., Brunnermeier, Sockin & Xiong 2017a,b).

The rest of this article is organized as follows. Section 2 reviews economic foundations for China's financial system. Section 3 discusses the current economic and financial conditions in China. An analysis of China's financial risks is conducted in Section 4. Section 5 concludes the article.

2. ECONOMIC FOUNDATIONS

The Chinese government developed the financial system with a mission to finance China's economic reform. This mission has so far dictated many aspects of China's financial system, such as its ownership structure, its development path, and the models it takes to finance different firms in the economy, which ultimately determine the risks and stability of the financial system itself. In this section, we briefly review China's economic reform and the roles played by the financial system.

2.1. Dual-Track Liberalization

The economic reform that the Chinese government started in the early 1980s has led to spectacular economic growth during the past 35 years; the average annual growth rate has been nearly 10%, and hundreds of millions of people have been lifted out of poverty. At the core of the reform was a dual-track approach that allows the coexistence of SOEs and private businesses. The success of the economic reform has proved several important advantages of this dual-track approach. First, it supports gradualism. As we elaborate below, by continuing to support SOEs, the dual-track approach avoided a sudden collapse of the state sector and the likely consequence of massive unemployment and social instability. (For a theoretical framework on the dynamic sustainability of China's politico-economic regime, see Wang 2016.) For this reason, the dual-track approach is also referred to as a "reform without losers"; Lau, Qian & Roland (2000) establish the conditions under which dual-track price liberalization is Pareto-improving. By minimizing the political resistance to private business, the dual-track approach has given birth to more than 20 million private firms. In addition, the dual-track approach nurtured "crony capitalism with Chinese characteristics" (Bai, Hsieh & Song 2018). Many private firms are closely connected with local governments, which help remove entry barriers, cut red tape, and offer financial support. In fact, China's phenomenal growth largely has been driven by the growth of private businesses (see, e.g., Song, Storesletten & Zilibotti 2011; Brandt, Van Biesebroeck & Zhang 2012).

Second, the boom of the private sector forced the state to improve the efficiency of SOEs and to tighten their soft budget constraints. The restructuring of the state sector was conducted under the slogan "grasp the large, let go of the small," i.e., shut down or privatize small SOEs and corporatize big SOEs. The specific measures of corporatization included, for example, establishing corporate governance, introducing a profit-based evaluation system, and rescinding administrative orders on daily operation. The transformation was successful to the extent that big SOEs improved their productivity relative to their private counterparts (Hsieh & Song 2015). More important, fiscal decentralization was replaced with centralization by the 1994 tax sharing reform, the Budget Law, and other policies and regulations. [This can be viewed as a turning point of decentralization or as economic liberalization started in the 1980s; see Huang (2008).] The central government is able to effectively control and allocate key resources in the economy, such as natural resources, public utilities, transportation, telecommunication, and finance, through the SOEs (Lin, Cai & Li 1998). With its ability to mobilize these important resources, the Chinese government has an unparalleled capacity to implement its economic policies, such as investment in large, capital-intensive infrastructure projects to upgrade roads, bridges, highways, airports, and ports throughout the country.

Nevertheless, the dual-track approach also comes with remarkable downsides. A key concern is that the protection of SOEs nurtures vested interests, which, in turn, blocks further reforms. Since 2008, the size of the state sector has stabilized at about 30% of the industrial sector, and the TFP convergence between SOEs and private firms has also stopped, with the capital productivity of SOEs remaining at about half of that of private firms (Hsieh & Song 2015). The state sector is even bigger in service industries, where misallocation is also significantly more severe (see Ge et al. 2017).

In contrast to what one would have expected, the financial system served mainly to support the inefficient state sector rather than funding the booming private sector. The banking system was developed in the late 1970s and early 1980s by splitting the commercial banking businesses of the PBC into four state-owned commercial banks (the Big Four): Agricultural Bank of China, Bank of China, Construction Bank of China, and Industrial and Commercial Bank of China. These state banks provided disproportional amounts of bank loans to support ailing SOEs and suffered enormous capital losses in the 1990s and the early 2000s.¹ With the banking system substantially limited by its bad loans, the stock market was created in the early 1990s to provide another funding source for the SOEs as well as a mechanism to reform their governance (see, e.g., Allen & Shen 2012; Allen, Qian & Gu 2017). The two stock exchanges in Shanghai and Shenzhen primarily listed SOEs in the early years; they started to list private firms only recently. The two bond markets, one an interbank market established in 1996 and the other an exchange market established in 2007, also favor bonds issued by local governments and SOEs (see, e.g., Borst & Lardy 2015). As we elaborate below, the special mission of the financial system to support SOEs has had profound impacts on both the efficiency and risks of the financial system. In particular, it made the financial system heavily exposed to the problems of SOEs.

2.2. Soft Budget Constraint

Soft budget constraint is a term originating from Kornai's study of centrally planned and transition economies. Such a constraint can arise in many circumstances due to the lack of commitment not to support a BC-organization (i.e., an organization that has a budget constraint) by an S-organization (i.e., an organization ready to cover deficits of the BC-organization) (see, e.g., Dewatripont & Maskin 1995; Kornai, Maskin & Roland 2003). In the context of China, SOEs enjoy a soft budget constraint, as the government lacks the commitment to liquidate losing SOEs. The soft budget constraint per se is a powerful explanation for the low efficiency of the state sector. The soft budget constraint, provided by the government through explicit and implicit subsidies, is also a cornerstone for the asymmetry in access to financial resources between SOEs and private firms, which has been vital to the survival of SOEs.

The favoritism for SOEs is ubiquitous in China's financial system. For instance, SOEs can borrow at regulated interest rates and go public with priority, while most private firms have to rely on internal financing or borrow from informal channels at much higher interest rates (Allen, Qian & Qian 2005). The responsibility of state banks to support the soft budget constraint of the SOEs has also been a key source of bad loans for state banks in the 1990s and the early 2000s (for the mandate of the stock market to fund SOEs as a reason for the lack of efficiency of China's stock market, see Allen & Qian 2014). Consequently, there is a large and persistent gap of returns to capital between SOEs and private firms. Capital allocation is severely distorted (Hsieh & Klenow 2009, Hsieh & Song 2015, Song & Wu 2015).

All the major commercial banks are state owned and enjoy a soft budget constraint themselves. Their profits are protected by the spread between the benchmark bank deposit rates and lending rates, which are set by the PBC (for a discussion of China's interest rate liberalization, see Section 3). This spread has remained about 3% in the past 20 years. When this spread was insufficient to cover the bad loans of these banks in the 1990s and early 2000s, the government twice

¹See, e.g., Allen et al. (2012) and Walter & Howie (2012). In the 1980s and 1990s, nonperforming loans were typically absorbed by money creation that led to chronic high inflation (Brandt & Zhu 2000).

recapitalized them and eventually listed all of them on the stock markets, both inside China on the Shanghai Stock Exchange and outside on the Hong Kong Stock Exchange.

Local governments at all levels of the government hierarchy also enjoy a soft budget constraint from the central government. Fiscal decentralization in the 1980s allowed local officials to keep fiscal surpluses, which could be used to support local projects. Local fiscal capacity has been greatly expanded by land revenue since the 1990s. As will be discussed in Section 3, the financial deregulation after 2008 further relaxed local governments' budget constraint, granting more flexibility for local officials to influence credit allocation.

A direct implication of the soft budget constraint is that SOEs, state banks, and local governments are not as price sensitive as one would expect from profit-maximizing agents. For example, after the crisis-induced economic stimulus program ended in 2010, despite the fact that the central government explicitly instructed local governments to scale down many of their projects and banks to stop funding those projects, local governments continued to scale up rather than down and managed to obtain funding from the shadow banking system at substantially higher costs (Chen, He & Liu 2017). When a substantial fraction of the participants is not particularly sensitive to the costs of funding, it is difficult for asset prices determined by the typical market equilibrium to be efficiently anchored on the asset fundamentals. Thus, the lack of price sensitivity of these important institutions has been a key obstacle for China's development of a market-driven financial system. This is also a key reason for the PBC's current use of a quantity-based monetary policy framework that directly targets money supply (Sun 2015), rather than a seemingly more convenient price-based framework that anchors on interest rates like the one used by the US Federal Reserve Board.

Another implication of the soft budget constraint is implicit government guarantees. Specifically, even when SOEs, state banks, and local governments suffer large financial losses, their creditors anticipate that the government will bail them out. As a result, creditors continue to offer them credit at substantially lower costs relative to private firms with similar financial status. This in turn encourages them to further build up, rather than scale down, financial leverage. This kind of risk-seeking problem is a standard agency problem, caused by the implicit government guarantee, and is key to understanding risks in China's financial system. Zhu (2016) provides an extensive account of how government guarantees might have contributed to excessive speculation and price bubbles in China.

3. CHINA'S CURRENT ECONOMIC AND FINANCIAL CONDITIONS

In this section, we investigate the current economic and financial conditions in China's household, corporate, and government sectors. We also review recent developments in the financial system.

3.1. Households and Firms

China saves about half of its GDP (see **Figure 3**). The high aggregate saving rate comes from high savings by both households and firms. China's urban household survey, which biases saving rates downward by underrepresenting rich households, shows an average saving rate of 30%. The national data adjusted by the NBS suggest that the household sector saves more than 40% of its earnings. There is a long list of factors that may contribute to the extraordinarily high household saving rate (for a literature review, see Yang 2012; for more recent work, see Wei & Zhang 2011; Chen & Chen 2016; Choukhmane, Coeurdacier & Jin 2016; Cooper & Zhu 2017). All the factors are associated with some China-specific institutional features, suggesting that high household savings are likely to persist in the near future.

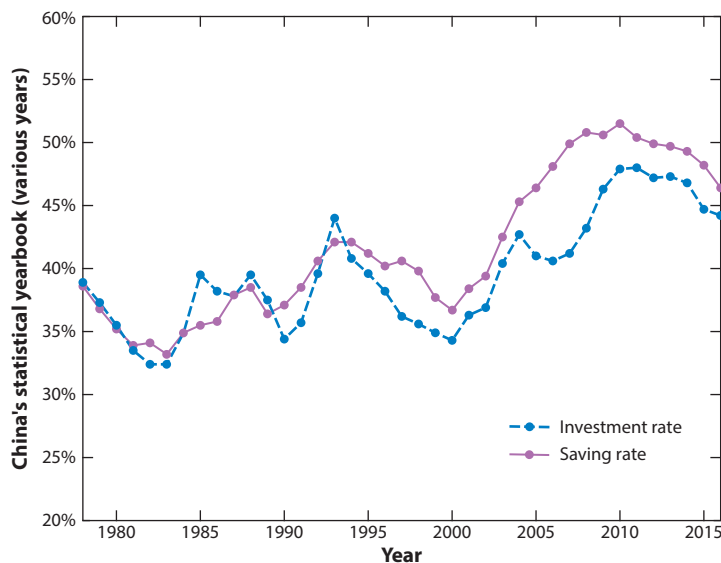


Figure 3

Saving (solid purple line) and investment (dashed blue line) rates in China from 1978 to 2016. Data from the National Bureau of Statistics of China (<http://data.stats.gov.cn/english/easyquery.htm?cn=C01>).

The housing price boom greatly increased the net worth of Chinese households. Despite fast-growing mortgages, the balance sheet of Chinese households remains solid. Only 30% of bank loans are made to households (mostly mortgage loans). While the required down payment varies over time, it has stayed at high levels—at least 20% for first homes and 30% for second homes. To curb the recent housing price boom, the required down payment was raised to 50% or higher in some big cities. Even a significant housing price adjustment would be unlikely to trigger a mortgage crisis of the scale seen in the Great Recession of the United States.

Chinese firms also have a high saving rate. The corporate sector accounts for about half of nongovernment savings (Yang, Zhang & Zhou 2011). The literature is relatively thin on China's high corporate saving rate. Yet it has been widely acknowledged that the high rate is caused by firms' precautionary motives (see, e.g., Li 2001, Gordon & Li 2003). Due to the nature of the dual-track reform discussed above, the financial system—including banks, the stock market, and the bond market—favors SOEs. As a result, most private businesses have been excluded from formal credit channels, and private investment has been primarily financed by firms' own savings (Allen, Qian & Qian 2005). In turn, higher returns to investment in the private sector—the flip side of the higher financing costs—encourage private firms to save more. Again, this is unlikely to change in the near future.

Despite the financial frictions and other barriers, the private sector has been flourishing over the past two decades. It now accounts for 80% of China's urban employment and continues to be the main growth engine. The inefficient state sector used to be a big burden that could possibly drag China into a crisis. While the reform of the state sector is far from complete, the surviving SOEs have greatly improved their vitality. In contrast to their moribund status in the 1990s, today's SOEs do not pose an imminent threat to China's economic and financial stability. In fact, some of the SOEs have even managed to establish monopolistic positions in various upstream industries, such as energy, transportation, telecommunications, and finance, under the protection

of industry regulations (see, e.g., Li, Liu & Wang 2014). The main concern is now the relatively low efficiency of the state sector and its long-run implications.

In summary, China's domestic savings are more than enough to finance its investment, a blessing for a fast-growing economy. **Figure 3** shows that the aggregate saving rate has been greater than the investment rate since the mid-1990s—a mirror image of China's trade surplus (Song, Storesletten & Zilibotti 2011). The investment boom in the post-2008 period has reduced but has not yet completely removed the surplus. There is no significant external debt. A Greece-like crisis is unlikely to happen.

3.2. Local Governments

Local governments have played an important role in China's economic development as well as in the financial risks related to rising real estate prices and rising leverage across China. The central government has formed a tournament between local officials to encourage development in their local economies (see, e.g., Zhou 2002, 2007; Li & Zhou 2005). To outperform others, local officials need to build up local infrastructures (such as roads and highways), which in turn help to attract businesses and investments (for a theoretical model of the local government tournament as a key driver of economic growth in China, see Xiong 2018). Competition between regions also drives local officials to provide resources, such as startup funds, tax subsidies, and land subsidies, to facilitate local business development and bail out nonperforming SOEs. This is referred to as regionally decentralized authoritarianism (Xu 2011, 2015; Qian 2017) or “crony capitalism with Chinese characteristics” (Bai, Hsieh & Song 2018).

The Budget Law enacted in 1994 prohibited local governments from running budgetary deficits. External financing was not allowed either. (The central government has modest fiscal deficits, with the deficit-to-GDP ratio of a mere 2–3%.) This has been widely viewed as a critical step in confining the soft budget constraint problem between local governments and their favored businesses. Instead, since the late 1990s, local governments greatly expanded their fiscal capacity by relying on nonbudgetary funding sources such as land revenue. The Chinese constitution states that urban land is owned by the state. In practice, land is administered by local governments. Revenue from sales of land use rights (land revenue henceforth) has accounted for about one-third of local government revenue (the sum of local fiscal revenue and land revenue) since the early 2000s.

Tying local government budget to land revenue is a novel design mechanism. Given the initial condition of underdevelopment across Chinese cities, local tax revenue was far from covering the need for funding large, capital-intensive infrastructure projects and other local business developments. The great uncertainty would also discourage banks from funding such projects, even if local governments were allowed to directly raise debt financing. However, the land prices that buyers pay, like equity prices, are determined not only by the current business conditions in a city but also their expected future conditions. Conditional on local governments using land revenue to improve local infrastructure and business environments, land prices can be substantially higher than what is justified by current business conditions, similar to the often-observed high share prices of new technology firms even when they have no earnings yet. The need for local governments to regularly sell land to the public also serves as a device to discipline them to carry out their pledged infrastructure projects. This arrangement is similar to staged venture capital financing for new firms.

This budgetary arrangement gives local governments the necessary resources and incentives to invest in infrastructure projects and support local businesses, which greatly contributed to the rapid urban and business developments across Chinese cities. The net effect of this budgetary

reform on the soft budget constraint is ambiguous, as local governments also have more resources to bail out failed businesses.²

The heavy budgetary reliance of local governments on land revenue also has profound implications for the real estate sector. As local governments are monopolistic land suppliers, the estimate of Wu, Gyorko & Deng (2012) suggests that much of the increase in housing prices occurred in land values. Concerns about the financial health of local governments also prompted the central government to frequently intervene in real estate markets, using measures such as mortgage policies to home buyers and credit policies to real estate developers, to manage potential cycles in the real estate prices (see, e.g., Fang et al. 2015). As we discuss below, these interventions in turn encourage real estate speculation of households and firms to acquire investment homes and land (see, e.g., Chen et al. 2017).

The 2008 stimulus plan compromised the borrowing constraint on local governments. Bai, Hsieh & Song (2016) demonstrate that most of the stimulus was financed by local governments through bank loans, as local governments could not have sold enough land to cover the stimulus. To facilitate local financing, the central government, for the first time since the early 1980s, relaxed the financial controls on local governments. A prominent regulatory change made by the CBRC turned out to be a key step (Document No. 92, CBRC, March 18, 2009). Specifically, local governments were encouraged to set up LGFVs to borrow from banks and financial institutions. This circumvents the Budget Law that prohibits local governments from borrowing. Auxiliary regulatory changes were also made by various units in the central government (including the Ministry of Finance) to endorse LGFVs. Consequently, about 1,800 LGFVs had issued bonds by 2015, while less than 100 did so before 2008. Local government debt is accumulating disturbingly fast even by the official statistics: The outstanding local government debt increased from less than 5 trillion yuan in 2008 to 23 trillion yuan in 2015. Bai, Hsieh & Song (2016) argue that much debt borrowed by LGFVs is not officially classified as local government debt. Their estimates suggest that the outstanding debt of LGFVs could be 46 trillion yuan in 2015, which is twice the official size of local government debt and about two-thirds of GDP in that year. Xiong (2018) attributes the rapid growth of LGFV debt to the tournament competition between local government officials.

Nevertheless, it would be far-fetched to conclude that local governments are becoming illiquid or insolvent. With annual fiscal revenues of 8 trillion yuan and annual land revenues of 3 trillion yuan, local governments have sufficient cash flow to pay the interest on their debt. Moreover, LGFVs' assets actually outgrew their liability. For the 1,800 LGFVs studied by Bai, Hsieh & Song (2016), their total assets amount to 70 trillion yuan—50% more than their liability. Much of the assets are land reserves. In other words, local governments are unlikely to be illiquid or insolvent in the near future unless China experiences a dramatic adjustment in land prices.

3.3. Financial Institutions

China has a bank-based financial system. Bond and equity financing account for only about one-fifth of the total credit to nonfinancial institutions. Unlike the nonfinancial sector, the financial sector is dominated by state-owned financial institutions. Most banks are state-owned. The Big Four alone account for more than 40% of total bank deposits. The main business of China's commercial banks is taking deposits and making loans. Before 2015, bank profits were guaranteed

²New land sales improve factor mobility and, hence, increase the opportunity cost of bailouts, through the lens of Qian & Roland (1998). In addition, land prices (especially residential and commercial land prices) are essentially determined by market forces, particularly local productivity. Diverting too many resources to inefficient businesses would eventually affect land prices and revenue. These are the disciplining mechanisms that harden local governments' budget constraints.

by interest-rate regulation that imposed a floor for the loan rate and a ceiling for the deposit rate, both around the benchmark loan rate and deposit rate published by the PBC. These benchmark rates usually leave a spread of about 3 percentage points, which is the main source of bank revenue. In 2015, the floor and cap were removed as a key to liberalizing interest rates. Nevertheless, the PBC continues to publish benchmark deposit and loan rates, and banks continue to closely follow them and profit from the spread.

In the early stage of the economic reform, the soft budget constraint was a major concern for the banking sector. The moribund state sector in the late 1990s led to a crumbling banking sector, where the ratio of nonperforming loans reached a record high of 30% in the early 2000s. Analogous to the corporatization of big SOEs, state-owned banks have experienced similar transformations that have made them more independent and profit driven.³ This process led to a much more competitive banking sector, which promoted financial innovations and eventually fostered shadow banking. The Big Four commercial banks were established in the late 1970s and early 1980s as spinoffs of the commercial part of the PBC. The Big Four enjoyed a disproportional share of the depositor pool. In contrast, the smaller banks, which are relatively new, lack household deposits and need to rely on interbank funding from the Big Four.

The competition for deposits among banks led to the rise of wealth management products (WMPs), which are a saving instrument that is not constrained by the deposit rate ceiling. In the mid-2000s, banks started to issue WMPs with higher returns (for evidence on the role of baking competition, see Acharya, Qian & Yang 2016). The tightening of the loan-to-deposit cap in the late 2000s further gave rise to nonguaranteed WMPs, which can move loans and deposits off balance sheets. This led to rich shadow banking activities (Hachem & Song 2016).⁴ **Figure 4** plots WMPs as percentage of GDP; the percentage increases from 2% in 2007 to 34% in 2015.

On the asset side, bank-trust cooperation is a first-generation off-balance-sheet channel that provides credit to firms that would have difficulty obtaining external financing otherwise. More WMPs were invested in municipal corporate bonds after 2011. As discussed above, LGFVs continued to grow after the stimulus program ended in 2010 and needed to pay back their bank loans. Chen, He & Liu (2017) argue that the rollover pressure precipitated the rapid growth of the shadow banking system, through which LGFVs were able to roll over their debt.⁵ Hachem (2018) provides a more detailed review of the growing literature on China's shadow banking, and Zhu (2017) analyzes its welfare implications.

Despite the recent rapid development of shadow banking, its overall size remains modest, with the total WMP balance being merely 18% of total bank deposits by the end of 2015,⁶ partly because the central government has tightened regulations by incorporating shadow banking activities into the PBC's macroprudential policy framework and thus imposing required capital on banks for such activities. The interbank market has become an increasingly important source for small and medium-sized banks' liquidity. Yet the Big Four remain a key fund supplier and can easily influence the market (Hachem & Song 2016). The rise of shadow banking has nevertheless presented a great challenge to China's monetary policy, which adopts a quantity-based framework with an

³The Law of the PBC and the Law of Commercial Bank were enacted in 1995 to guide and regulate banks' daily operations. The reform was further solidified by the establishment of the CBRC in 2003, which took over banking supervision from the PBC, and the public listing of all the major commercial banks in the 2000s.

⁴See also Sun (2017) regarding the rise of China's shadow banking from a regulator's perspective.

⁵Specifically, they find that providences with abnormally greater bank loan growth in 2009 experienced more municipal corporate bonds issuance (which was mostly through the shadow system) in 2012–2015.

⁶Entrusted loans are also an important part of China's shadow banking (for discussion of entrusted loans made by listed firms, see Allen et al. 2016; Chen, Ren & Zha 2016; Du, Li & Wang 2016).

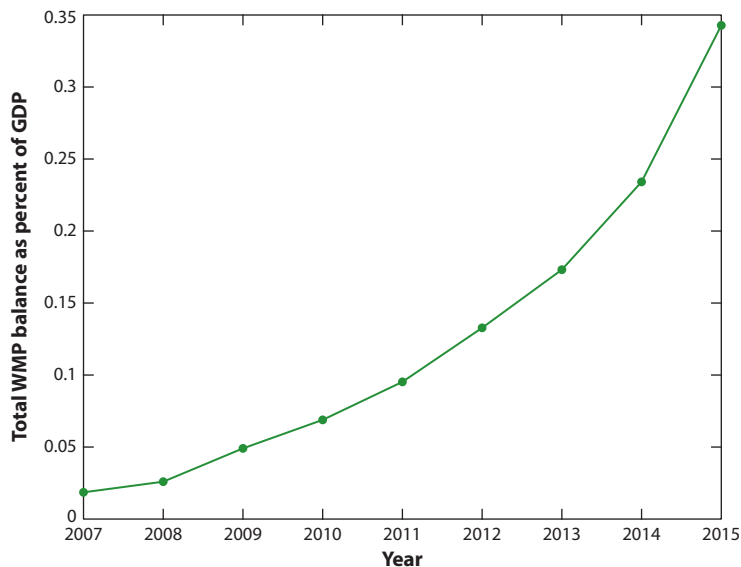


Figure 4

The size of wealth management products (WMPs). The figure plots the total WMP balance as a percent of GDP from 2007 to 2015. Data from China's Banking Wealth Management Market Annual Report.

intermediate policy target on money growth.⁷ Concerned by the difficulty in fully accounting for banks' on- and off-balance-sheet activities, the PBC has been pushing strongly for interest-rate liberalization, which is the necessary foundation for it to ultimately adopt a price-based monetary policy framework as an automatic stabilizer. To expose banks to more market competition, the PBC has been actively promoting the bond market, which has experienced rapid growth in recent years. The bond market now trades bonds issued by the central and local governments, as well as SOEs and publicly listed firms. The outstanding quantity of bonds has recently reached over 30% of bank loans. Equity financing accounts for a much smaller fraction of the total credit. As is discussed in Section 4, there have been very few defaults and delistings in China's bond and stock markets—a natural consequence of the above features associated with the dual-track reform. Interest-rate liberalization in such a system may cause more capital to flow to the state sector or shadow banking and, hence, aggravate welfare losses (see, e.g., Wang et al. 2012; Liu, Wang & Xu 2017).

4. FINANCIAL RISKS

This section highlights several key sources of financial risks in China. We first highlight the debt crisis risk, which is also closely related to concerns about the banking system. We then analyze housing risk and capital outflow risk, with the latter intricately related to China's exchange rate risk. We also discuss risk from the stock market, which tends to attract great public attention despite its relatively small role in financing the real economy. Finally, we highlight policy risk, which is deeply entangled with other sources of financial risks in China.

⁷Li & Liu (2017) provide evidence on China's quantity-based money policy. Sun & Jia (2015), Chen, Ren & Zha (2016), and Hachem & Song (2017) show how shadow banking can create money uncounted and credit booms unexpected by the financial system.

4.1. Debt Crisis Risk

As discussed above, the issue of quickly rising financial leverage across China has become prominent in recent years. In particular, a substantial fraction of the sharply increased debt was channeled through shadow banking. The joint occurrence of rapid housing price appreciation and quickly rising debt levels has alerted many commentators to the possibility of a debt crisis in China (see, e.g., Chen 2015, Maliszewski et al. 2016). In particular, many are worried that China might follow in the footsteps of the United States, which experienced a severe financial crisis initially triggered by the reversal of a dramatic housing boom in the mid-2000s. The US housing boom was largely financed by a dramatic credit expansion across the country to households and financial firms and, in particular, by credit expansion through the shadow banking system to subprime households (see, e.g., Mian & Sufi 2009).

Several factors make it unlikely for a Western-style debt crisis to occur in China in the short run. First, China has a large pool of domestic savings and a low level of external debt (see Section 3). Most of the debt in China is issued not only domestically but also, even more conveniently, from state-owned banks to state-owned firms. In fact, this asymmetry has been further strengthened in the post-2008 period for reasons discussed above.⁸ Second, and perhaps more importantly, Chinese institutions have been flexible enough for the state to develop creative ways to defuse a crisis in the short run. Some important policies implemented in the cleanup of massive bad loans in 1990s and 2000s are particularly worth documenting, as they may shed light on the possible tactics to be adopted in the future (for an excellent review, see Walter & Howie 2012). The moribund state sector led banks to have a nonperforming loan ratio above 30% in the late 1990s, a dangerous level that is likely to trigger a full-blown bank-run crisis in any economy with rigid market and policy rules (see, for example, Bonin & Huang 2001; for more detailed discussion, see below). To absorb the bad loans, the Chinese state took three steps to bend the rules without breaking them entirely. First, the central bank lowered the required reserve ratio to allow banks to buy special government bonds, which, in turn, were invested in banks as capital. Second, four large asset management companies were established in 1999, one for each of the Big Four, to absorb their nonperforming loans. This is also referred to as the good bank/bad bank strategy. In the Chinese context, the bad banks (i.e., the asset management companies) were thinly capitalized, while holding huge assets backed by nonperforming loans that were not appropriately valued. Third, to publicly list the Big Four, more bad loans had to be cleaned off. In 2003, the state injected about 50 billion USD from its foreign reserve into two of the Big Four.⁹ These tactics did not resolve bad loans. Rather, they managed to move the problems to the future. Fortunately, the strong economic growth and rapid expansion of the financial sector afterward eventually absorbed the bad loans. In short, it is the state, rather than market rules, that has the final say on bankruptcy. So long as the state has resources and willingness to save big businesses, bankruptcies with substantial aggregate implications will not occur.

Even if a large bankruptcy becomes unavoidable in China, it is unlikely to evolve into a debt crisis, which often occurs in the Western world when a borrower and lenders cannot agree to a mutually acceptable scheme due to all sorts of coordination and hold-up problems in preventing the bankruptcy from escalating into a crisis. For example, with a pool of lenders, the lenders

⁸The analysis by Chivakul & Lam (2015), for instance, indicates that among listed firms, the leverage of SOEs grew much faster than that of private firms after 2009. Even though some of the debt might have been issued informally through the shadow banking system, this debt structure nevertheless makes the debt problem manageable by the government.

⁹To quote Xie Ping, then director of the Financial Stability Bureau at the PBC (Walter & Howie 2012, p. 62), “This time, we did not just play a game with accounting. Real money went into the banks.”

face a difficult coordination problem among themselves when the borrower experiences financial difficulty. That is, a lender may choose to abandon a borrower preemptively when the borrower's financial status starts to deteriorate but is still sound. This happens because the lender is worried about holding a sinking ship when other lenders choose to dump the borrower (see, e.g., Morris & Shin 2004, He & Xiong 2012). This kind of coordination problem underlies the well-known bank-run problem, which troubles the Western banking system at its core (Diamond & Dybvig 1983). With the presence of an actively engaged central government in China's financial system, this kind of coordination problem is less likely to emerge, as the central government would step in to coordinate the lenders when needed.

Another important friction in debt crises is the inherent conflict of interest between the borrower and the lenders. As a typical debt contract gives the borrower a limited downside but all the upside, the borrower has a natural incentive to seek risk. To the contrary, lenders are strongly averse to risk, as they have only a limited upside from collecting the promised payments but plenty of downside in losing their initial loans. This conflict would again motivate the lenders to take on inefficient decisions to minimize risk, such as premature liquidation of a firm to preserve their stake in the firm or constraining a troubled firm from taking on risky but promising investments (which is called debt overhang; see Myers 1977). State ownership on both the lender and borrower sides of the debt makes it possible to resolve this kind of hold-up problem by converting debt into equity, as frequently has occurred in China (for discussion of how the state dealt with bad loans in the early 2000s, see Bonin & Huang 2001; for a recent plan for debt-for-equity swaps, see State Council, People's Repub. China 2016).

For these reasons, the rising leverage per se would not lead China to a Western-style debt crisis. However, the flexibility and capacity of the Chinese State to defuse the potential debt crisis also reflect its lack of commitments to liquidate inefficient firms, which is the key driver of the rising leverage in the first place, and which may eventually lead to other severe long-run problems. Xiong (2018) develops a theoretical model to show that the ability of local governments to coordinate banks in rolling over their debt to LGFVs disables banks from exerting much-needed market discipline on the excessive leverage of local governments.

We also highlight the efficiency of credit allocation during this credit boom. Chen, Ren & Zha (2016) show that during China's economic stimulus, bank credit was allocated disproportionately to financing investment in real estate and heavy industries, which reflected the government's strategy to rely on these industries to stimulate GDP growth. Cong & Ponticelli (2016) also show that new credit was allocated disproportionately more toward state-owned, low-productivity firms than to privately owned, high-productivity firms, reversing the prior trend of efficient reallocation. Using data from 2006–2013, Huang, Pagano & Panizza (2016) provide evidence that debt issuance by local governments crowded out investment by private manufacturing firms. This misallocation reflects the implicit guarantee problem discussed above. As SOEs and local governments have a soft budget constraint, banks are not concerned by their credit risk. The effect of this implicit guarantee is especially large when economic uncertainty is great. Tan, Huang & Woo (2016) estimate that removing zombie firms, which are mostly insolvent SOEs that are kept alive by bank credit, would lift China's TFP by 1.06 percentage points per year.

Finally, since two-thirds of China's outstanding debt is bank loans, the factors that may work to avoid a debt crisis may also work for any potential banking crisis in China. In Section 3.3 we reviewed the reasons why financial market liberalizations (including the rise of shadow banking) are still far from accumulating risks big enough to shake the banking sector. There is concern about the recent rise in the publicly reported nonperforming loan ratio, which increased from 1.3% in 2010 to 1.7% in 2016 for the Big Four. Despite the potentially serious downward bias in these numbers, the relative size of the bad loans in today's China is substantially smaller than

that two decades ago. While the economic reform has not resolved the aforementioned major problems in the banking sector, the current strategy is again to defer them to the future. To the extent that the ability of the Chinese state to resolve any potential debt or banking crisis rests on the country's economic growth, the growth risk is thus the ultimate risk behind the rising debt problem.

4.2. Housing Risk

China has been experiencing a dramatic and long-lasting housing boom across the country since the reform of the housing market in 1990s. This boom has led to substantial concern in recent years that rising housing prices might have developed into a gigantic housing bubble that might eventually burst and damage both the financial system and the economy (see, e.g., Wu, Gyourko & Deng 2016; Glaeser et al. 2017; Chen & Wen 2017).

An important contributing factor to this concern is the lack of reliable statistics about the housing markets across the country. Fang et al. (2015) provide a useful account of these issues by examining a detailed data set of mortgage loans and constructing housing price indices for 120 major cities in China in 2003–2013 based on sequential sales of new homes within the same housing developments. Their housing price indices show enormous housing price appreciation across China in 2003–2013: an average annual real growth rate of 13.1% in the four first-tier cities, 10.5% in second-tier cities, and 7.9% in third-tier cities. Interestingly, they also show that the enormous price appreciations were accompanied by equally spectacular growth in households' disposable income—an average annual real growth rate of about 9.0% throughout the country during the decade. The quickly rising household incomes, together with a well-known observation of high down payment ratios of at least 20%, and typically 40%, on mortgage loans, make the financial risk brought by a potential housing market crash much lower than that faced by the US housing market in the mid-2000s.

Yet this study also finds that low-income home buyers often endured enormous financial burdens in buying homes at price-to-income ratios of about eight in second- and third-tier cities and, in some years, even over ten in first-tier cities.¹⁰ It is difficult to simply attribute the willingness of these households to endure this large financial burden to their consumption needs. Instead, their home purchases were likely driven by a speculative motive to gain from future housing price appreciations (for a theoretical model analyzing China's housing price dynamics from households' liquidity constraints and expectations, see Zhang 2017).

Households' expectation of high housing price appreciations can be attributed to two key factors. One is a behavioral reason, and the other an institutional reason. First, the human tendency of extrapolating past trends into future trends is likely to cause households to hold high expectations of rapid income growth and housing price appreciations going forward (see, e.g., Case & Shiller 2003; Gennaioli, Shleifer & Vishny 2015; Barberis et al. 2016). Through such expectations, the housing market risk is also ultimately driven by the economic growth risk. If the Chinese economy can maintain a high growth rate, which has slowed to 6.9% in recent quarters,

¹⁰In concrete terms, this means that a household paid eight times its annual disposable income to buy a home. Suppose that the household made a down payment of 40% and took a mortgage loan for the other 60% of the home price, which would be 4.8 times its annual income. A modest mortgage rate of 6%, which is low relative to the actual rate observed during the decade, would require the household to use nearly 30% of its annual income to pay for the interest on the mortgage loan, in addition to consuming another 16% of its annual income to pay down the mortgage loan based on a linear schedule for a 30-year loan. Together, buying the home entails the household saving 3.2 times the annual household income to make the down payment and using another 45% of its annual income to service the mortgage loan.

then households' high expectations would be sustainable. However, some critics, such as Pritchett & Summers (2014), argue that a mean reversion of the spectacular growth rate of the Chinese economy might soon occur. If so, there is a serious risk imposed by the subsequent collapse of household expectations on housing prices.

Second, the government's countercyclical interventions also reinforce home buyers' high expectation of future housing price appreciations. As summarized by Fang et al. (2015), local governments control land supply and heavily rely on land revenue, and banks are heavily exposed to risks in the real estate sector. As a result, it is widely perceived that the real estate sector is too important to fail. Indeed, consistent with this perception, the central government has frequently intervened in the housing market. When the market is considered overheated, the PBC tends to tighten mortgage down payment requirements and raise mortgage interest rates. When the market is considered depressed, the PBC tends to reverse these measures and even use monetary policy to provide additional supports. These interventions have so far prevented any major crash in the real estate market at the national level.

Overall, the enormous housing price appreciation across China is supported by rapid household income growth, yet the high price-to-income ratios across different cities build on high expectations of future economic growth and income growth. Thus, like the debt crisis risk, the housing risk is also essentially the economic growth risk. If the economic growth rate falls substantially below the currently level of 6.9% in the near future, it would be difficult to sustain home buyers' high expectations and thus to keep price-to-income ratios at the current level.

The real estate boom across China also has an important effect on firm investment and the efficiency of capital allocation across firms. Chen et al. (2017) document an intriguing observation that publicly listed firms in China, excluding financial, real estate, and construction firms, on average spent nearly 20% of capital investment in 2000–2015 on acquiring land—not just industrial land, but also commercial land and residential land, which cannot be used to build production facilities. In some years, land investment contributed to as much as 40% of these firms' investments. More importantly, this study finds that the ongoing real estate boom across China leads not only to the well-known collateral effect, through which rising land prices allow land-holding firms to get more bank loans collateralized by their land holdings, but also to two additional effects (for a theoretical analysis of the effect of credit expansion on capital misallocation through collateral value, see Bleck & Liu 2018). One is the so-called crowding-out effect, through which the real estate boom crowds out the access of non-land-holding firms to bank financing; similar crowding out is also documented by Shi, Wang & Wu (2016). The other is the so-called speculation effect, through which rising land prices induce land-holding firms with access to financing to acquire more land and reduce their nonland investment.¹¹ Furthermore, Chen et al. (2017) find that firms with lower, rather than higher, Tobin's *Q* and productivity tend to hold land. As a result, through these three effects, the real estate boom has a profound negative impact on the efficiency of capital allocation across firms, thus hurting China's overall economic growth. This growth effect may in turn exacerbate the housing risk.

4.3. Capital Outflow Risk

There is also growing concern about capital outflow risk in China, which is also intricately related to risk of the RMB exchange rate. To modernize its financial system, China has gradually opened

¹¹ Shi (2017) also finds that the real estate boom induces capital reallocation within existing private businesses from the manufacturing sector to the real estate sector.

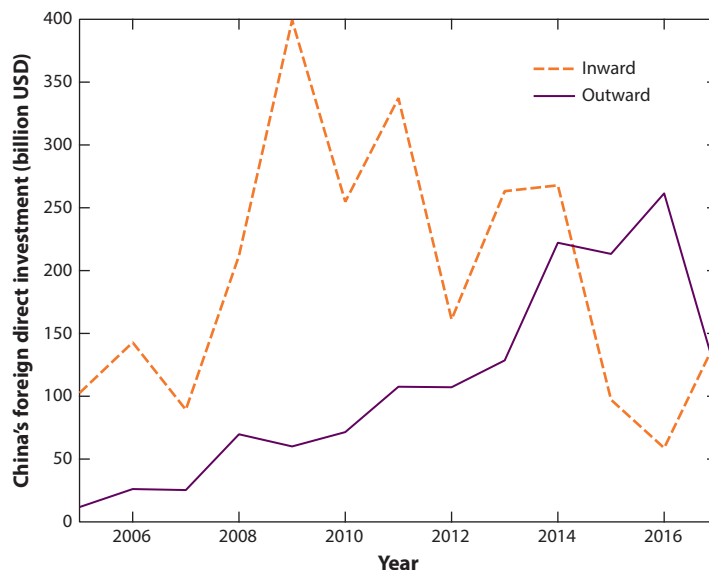


Figure 5

China's inward (*dotted orange line*) and outward (*solid purple line*) foreign direct investment (billion USD) from 2005 to 2017. Data from the State Administration of Foreign Exchange.

up its capital accounts. China is now the largest recipient of foreign direct investment among developing economies, with an average of 200 billion USD annually since 2005 (see **Figure 5**). China's outward direct investments were small before the mid-2000s but grew very fast afterward (see **Figure 5**). Controls on international portfolio investments have been partially liberalized, although the inflow and outflow of portfolio investments remain an order of magnitude smaller than direct investments.¹² China also has made a great effort to internationalize the RMB. In November 2016, it achieved a milestone of getting the RMB into the International Monetary Fund's special drawing rights (SDR) basket, together with the US dollar, the euro, the Japanese yen, and the British pound, with a weight of 10.92%. This SDR membership establishes the RMB as a reserve currency. The capital account surplus, together with the current account surplus, led to a rapid growth of foreign reserves, which peaked at a level of 4 trillion USD in 2014 (for a detailed account of these developments, see Prasad 2017).

The two-decade-long foreign reserve accumulation ended in 2015. Foreign reserves fell by a quarter in one year and are now back to 3 trillion USD. This adds to the growing concerns about China's financial stability. Trade surplus is declining as a consequence of the increase in investment after 2008 (see **Figure 3**; for a structural view of the declining trade surplus, see Sun & Lu 2012). Yet, despite the plunge in foreign reserves, China still has a sizable trade surplus, which is about 2–3% of its GDP. Capital outflow plays a much bigger role. In 2015, for the first time since the economic transition started in the late 1970s, China's outward direct investment exceeded its inward direct investment (see **Figure 5**). This is not entirely unanticipated. In fact, inward direct investment has been on a declining trend since 2010, while the opposite is true for outward investment. We emphasize two factors that may turn capital inflow to outflow. The deteriorating

¹²For instance, foreign investors identified as qualified foreign institutional investors are allowed to buy Chinese stocks and bonds. See Song, Storesletten & Zilibotti (2014) for more institutional details and Chang, Liu & Spiegel (2015) for a theoretical analysis on the trade-off between sterilization and domestic price stability.

resource allocative efficiency in the postcrisis period lowered the aggregate return to capital: It dropped from an average above 10% before 2008 to 4% in 2013 (Bai & Zhang 2015). In other words, China has been losing its attraction to foreign capital. In addition, skyrocketing housing prices greatly increase Chinese households' net worth and provide incentive for them to diversify their portfolios. A back-of-envelope calculation suggests that Chinese households have a total wealth of 600 trillion yuan.¹³ Converting merely 3% of domestic assets into foreign assets would exhaust China's current foreign reserves. As shown in **Figure 5**, outward direct investment jumped to about 220 billion USD in 2014 and 2015, almost doubling the number from 2013. Although we do not have the data, anecdotal stories about Chinese real estate buyers around the world suggest that portfolio diversification plays an important role in boosting outward investment.

The dwindling trade surplus and the reversal of capital flows put depreciation pressure on the Chinese yuan. The sudden but mild depreciation by 2% in August 2015 failed to defuse the risk. The currency continued to depreciate by 10% against the USD and by 15% against a basket of currencies weighted by trade in 2016. The depreciation expectation further fueled capital outflow, which, in turn, led to speculation and strengthened depreciation expectations. To break the vicious cycle, the Chinese government chose to impose stricter capital controls and reserve requirements on onshore RMB deposits of offshore financial institutions in 2016. The latest statistics suggest that these measures have been effective. China's outward direct investment in 2017 was 116 billion USD, less than half of the investment in 2016. The exchange rate has also stabilized. Once again, the concern is about the medium- and long-run risks. If resource allocation efficiency continued to worsen, the Chinese government would probably have to depreciate the yuan by a large margin. Moreover, given the heavy interventions by the government in the exchange rate markets, the expectation about how the Chinese government would manage the exchange rate in the future is also important for the market to form depreciation expectations.

4.4. Stock Market Risk

While China's stock market plays a smaller role than banks and the bond market in providing financing to firms, stock market fluctuations tend to attract great public attention. In particular, the boom and bust of the stock market in 2015 caused anxiety across the globe about the health of China's financial system. It is useful to note several important characteristics of China's stock market.

First, like other sectors of the financial system, the stock market was initially developed in the early 1990s to help fund and improve ailing SOEs. This mission dictates that the regulations and policy enforcements of the stock market be protective of SOEs, as reflected in various aspects of stock market operations. Initial public offerings (IPOs) in the stock market are subject to an aggregate quota determined by the China Securities Regulatory Commission (CSRC), which allocates the quota across regions and industries according to regional development goals. During the first 15 years of the stock market, SOEs enjoyed the privilege of being listed, while private firms were able to get listed only in recent years (see, e.g., Allen & Shen 2012). This selection makes the listed firms poorer performers than unlisted firms both *ex ante* and *ex post*, and consequently the stock market has offered disappointing returns to investors in its 25-year history despite China's spectacular economic growth (Allen et al. 2017). There is also extensive evidence showing that

¹³We estimate financial assets of 90 trillion yuan by the end of 2015, with household bank deposits of 48.5 trillion and a stock market value of 41.8 trillion (assuming all circulated shares are held by Chinese households). Xie & Jin (2015) find that financial assets account for 10.6% of total Chinese household wealth in 2012. Assuming the proportion of financial assets to be 15% in 2015, we obtain a total wealth of 600 trillion yuan.

political connections affect IPO selection and IPO returns (see, e.g., Fan, Wong & Zhang 2007; Piotroski & Zhang 2014).

China has adopted accounting regulations and standards for publicly listed firms similar to most developed countries, and, in particular, strict profit requirements for firms to qualify for IPOs. However, the enforcement of the accounting rules has been lax, and penalties for accounting violations have been light (for detailed accounts of the information environment and legal enforcement related to publicly listed firms in China, see Piotroski & Wong 2012, Allen & Shen 2012). Strict enforcement would have disqualified some SOEs for IPOs, as they relied on earnings management to satisfy the requirement on IPOs (see, e.g., Aharony, Lee & Wong 2000; Chen & Yuan 2004; Chen, Lee & Li 2008; Allen et al. 2017). Furthermore, there have been very few delistings in China's stock market, in sharp contrast to the large number of delistings in the US stock market, which are roughly in balance with the number of IPOs each year. One can again explain the small number of delistings on the basis of the soft budget constraint or the political power of the SOEs, which are aligned with the interests of local governments and can often resist orders from the CSRC. The lack of delistings in turn limits the number of new IPOs on the stock market and leads to substantial shell value of weak listed firms that wait for merger offers from unlisted firms seeking an alternative channel to be listed (see, e.g., Lee, Qu & Shen 2017).

Second, China's stock market was developed outside the banking system, as banks are not allowed to directly trade in the stock exchanges. As a result, the stock market has been populated by retail investors, who started to invest in stocks only in the early 1990s after the stock market was shut down for nearly half a century. A large body of academic studies has shown that the Chinese stock market is substantially more speculative than the US market (for a review, see Carpenter & Whitelaw 2017). Stock prices in China's A-share market are highly volatile, as demonstrated by the dramatic boom and bust of stock prices in 2007–2008 and again in 2014–2015 (see **Figure 6**). The A-share market also has a remarkably high turnover rate, which has often been a monthly rate of 100% and has routinely stayed at the level of 40% per month—the highest among major national stock markets. The turnover rate directly reflects the speculative behavior of many investors, who aim to make a quick profit through trading rather than investing for the long term. There

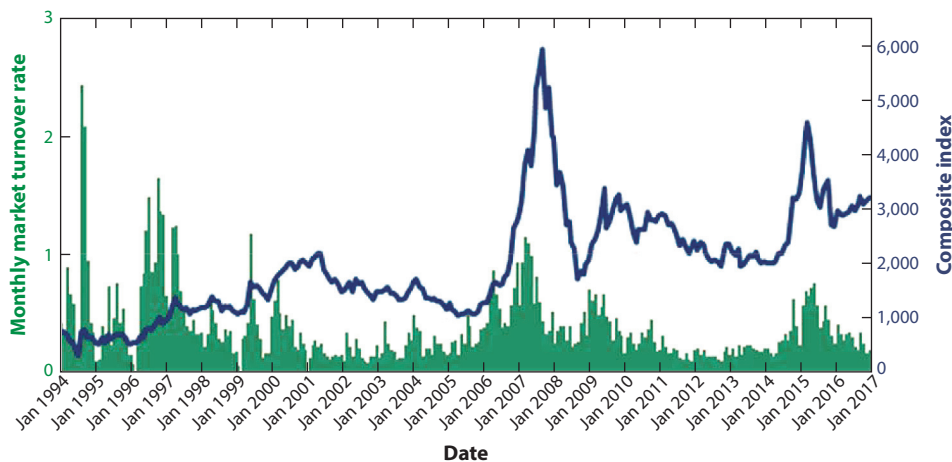


Figure 6

Shanghai Stock Exchange monthly market turnover rate (*vertical axis, left*) and Composite Index (*vertical axis, right*).

is also extensive evidence linking investors' speculative motives, induced by their heterogeneous beliefs, to stock prices in China (see, e.g., Mei, Scheinkman & Xiong 2009; Andrade, Bian & Burch 2013; Chang et al. 2015; Hong et al. 2014; Jia, Wang & Xiong 2017). The spectacular price bubble associated with the deep out-of-the-money put warrants traded on the Shanghai and Shenzhen Stock Exchanges in 2005–2008 provided another vivid example of how investors who lacked the basic knowledge of stock warrants caused frenzied speculation and highly inflated prices for fundamentally worthless securities (Xiong & Yu 2011; Gong, Pan & Shi 2016; Pearson, Yang & Zhang 2017).

Third, despite the rapid growth of China's stock market, equity offerings contributed to only about 5% of the total social financing to the real economy in 2015, while bank loans contributed over 70% (according to social financing statistics provided by the NBS). Due to this relatively small contribution to social financing, high stock market volatility is usually not a serious concern to the real economy.

Finally, the boom and bust of the stock market in 2015 deserves special attention due to the heavy use of financial leverage by stock investors. China has allowed investors to buy stocks on margin only since March 2010, initially within a highly restricted list of only 90 stocks. The list was gradually expanded to cover 800 stocks by September 2014. While buying on margin in the stock exchanges was closely monitored, a large amount of leverage was also employed outside the exchange system. Allegedly, some investors used leverage of a multiple of eight or even ten to buy stocks in the off-exchange margin system. This large amount of leverage served to strongly prop up the stock market before it peaked in June 2015. As the market started to turn back down, leverage caused a liquidity spiral, as is often seen in financial market crashes across the world, leading to forced and preemptive liquidation by investors with large leverage (e.g., Bian et al. 2017a,b). At one point, this liquidity spiral threatened the stability of the financial system, and the CSRC had to orchestrate a national team of financial firms to bail out the falling stock market. The bailout eventually calmed down the stock market in late summer of 2015 (Huang, Miao & Wang 2016).

In the aftermath of the dramatic stock market boom and bust, the CSRC has substantially tightened the use of margin buying both on and off the two stock exchanges. It is thus unlikely that similar leverage-induced cycles will occur again in China's stock market in the near future.

4.5. Policy Risk

Due to the two-track structure of the Chinese economy, the government has maintained a highly active role in managing the economy and the financial system. The extensive policy interventions by the government have important implications for the risk and efficiency of the financial system.

There are several key motivations for government interventions in the financial system. First, as discussed above, the financial system provides the necessary financial instruments to fund the government's policy agenda. As a result, the government has undertaken various initiatives to develop different financial markets and sectors to meet its funding needs. Second, the government believes that countercyclical management of the financial system is necessary due to the presence of a large pool of inexperienced institutions and investors, which are often subject to excessive sentimental fluctuations. Guided by a paternalistic philosophy to protect inexperienced investors and maintain market stability, the government has employed a wide range of policy tools to intervene in the financial system.

For example, the PBC has frequently used its authority to change benchmark interest rates for bank deposits and loans, which directly affect the costs of funding throughout the whole economy. The PBC has also frequently changed the required reserve ratio for banks to manage liquidity in the banking system. In recent years, the PBC has also developed a macroprudential framework

that allows it to manage the risk taking of banks and other financial institutions by varying the required capital for their different investment activities (for a thorough account of the PBC's financial and monetary policies, see Sun 2015). As discussed above, the government has also used a range of policy tools to manage cycles in the real estate sector, including changing interest rates and down payment requirements for mortgage loans and imposing restrictions on second-home purchases by residents and investment-home purchases by nonresidents (e.g., Fang et al. 2015). In the stock market, the CSRC has also used several policy tools to manage stock market fluctuations. The CSRC directly controls IPO issuance and has suspended IPO issuance nine times since 1992, sometimes for longer than one year. Cong, Howell & Zhang (2017) find that the disruptions to the IPO process had strong negative effects on firms' innovation activities, such as patent applications and fixed tangible investments. Even during regular periods, the CSRC determines the aggregate quota for IPO issuance and the allocation of the IPO quota across sectors and regions. The CSRC has also changed the stamp duties imposed on stock trading seven times since 1992, with the tax rate going as high as 1% in 1998 and coming down as low as 0.1% in recent years (e.g., Deng, Liu & Wei 2018).

Active government interventions have profound impacts on the financial system. Policies and regulations can deliver unintended consequences, some of which may be entirely counterproductive; Hachem & Song (2017) show that tightening of liquidity rules may lead to a credit boom through shadow banking. While countercyclical interventions help to stabilize financial markets, they may reduce the information efficiency of asset prices. An unintended consequence of government interventions is that interventions add another source of noise from the government's policymaking processes into the financial markets. When the interventions are sufficiently active, this government noise factor may become a key factor in driving market dynamics. When this happens, investors and market participants may devote their limited attention to analyzing the government factor rather than economic fundamentals, which in turn may make asset prices in the financial system less efficient in reflecting economic fundamentals. Brunnermeier, Sockin & Xiong (2017b) recently developed a theoretical model to highlight this economic mechanism.

Brunnermeier, Sockin & Xiong (2017a) further argue that this unintended consequence of government interventions may undermine the government's financial reform. "Crossing the river by touching the stones" has been a hallmark strategy of China's economic reform. This strategy has worked well because it usually takes months, even quarters, for the economy to react to a policy change, leaving policy makers just enough time to study the reaction and discern appropriate policy adjustments. However, predictable policy changes in financial markets would stimulate speculation by market participants. Speculation, especially frenzied speculation with high leverage, may destabilize the markets. When this happens, speculation may cause asset prices to overshoot to levels beyond what is justified by the government's intended policy change and may even force the government to make the policy change more aggressive than initially planned. At a deeper level, this leads to the widely discussed time-inconsistency problem in policy making.

Indeed, in China's stock market, Chen et al. (2018) provide empirical evidence showing that investor speculation can make the 10% daily price limit rule, a well-regarded market stabilization mechanism, counterproductive. Specifically, they find that large investors tend to push stock prices up to the 10% limit on days with large positive returns and then profit from selling on the next day. In doing so, their trading makes extreme positive returns more, rather than less, likely. Furthermore, Liu, Xu & Zhong (2017) find that such trading restrictions served to spread market contagion during China's stock market crash in the summer of 2015, again due to investors' preemptive and speculative behavior. In China's short-lived warrant market, Cai et al. (2017) provide another example that the government's increase in the stamp tax for stock trading in May 2007 at the height of a stock market boom led to the trading frenzy to migrate from the

stock market to the warrant market, which was not subject to the stamp tax. Furthermore, Chen, Petukhov & Wang (2017) develop a theoretical model to show that market-wide trading halts may increase, rather than decrease, the probability of hitting the triggering price threshold, which helps explain the short-lived circuit breakers adopted by China's stock market in January 2016.

Frequent government interventions also reinforce the perceived government guarantees by market participants, which in turn create another channel to indulge excessive risk taking by market participants (for a full account of how government guarantees have led to widespread risk-taking behavior across China, see Zhu 2016).

Through the aforementioned channels, households and firms across the country have strong incentives to use various instruments offered by the financial system to load on risks that are tied to policy agendas and regulations of the government. As a result, the financial system may serve to aggregate risks—risks that are backed by the government—instead of spreading risks across different households and firms. This may eventually reduce the efficiency of the financial system and exacerbate systemic risk.

5. CONCLUSION

By reviewing China's unique economic and financial systems, we argue that the widely held concerns about rising leverage and housing prices are unlikely to lead to an imminent financial crisis in China. Instead, we believe the ultimate risk lies with the efficiency of the financial system in allocating capital and supporting China's economic growth. In particular, a vicious cycle of distortions in the financial system may lower economic growth and exacerbate financial risks in the long run.

DISCLOSURE STATEMENT

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