



WP/16/181

IMF Working Paper

China's Financial Interlinkages and Implications
For Inter-Agency Coordination

by Min Liao, Tao Sun, and Jinfan Zhang

I N T E R N A T I O N A L M O N E T A R Y F U N D

IMF Working Paper
Monetary and Capital Market Department
**China's Financial Interlinkages
And Implications For Inter-Agency Coordination**

Prepared by Min Liao, Tao Sun, Jinfan Zhang¹

Authorized for distribution by Daniel Hardy

August 2016

IMF Working Papers describe research in progress by the author(s) and are published to elicit comments and to encourage debate. The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, IMF management, or China Banking Regulatory Commission (CBRC).

Abstract

China's financial system has become very large, diversified, and interconnected. This changing financial landscape could potentially produce systemic risks, arising primarily from growing financial interconnectedness. The paper argues that, to address the potential systemic risks, Chinese authorities should further strengthen internal coordination, notably by institutionalizing better information collection and sharing among regulators, as well as enhancing coordinated and comprehensive analysis of systemic risk.

JEL Classification Numbers: E44, E58, F34, G23

Keywords: financial landscape, risks, policy coordination

Authors' E-Mail Addresses: liaomin@cbrc.gov.cn, tsun@imf.org, jzhang2@imf.org

¹ We are grateful to Yang Cong, Yejing Zhou, Xueguan Lin, Jie Tang, Moran Wu, Hong Kou, and Ying Fan for their insightful comments. Thanks to Sharlin George for the technical support. Remaining errors and omissions are the authors' responsibility.

Content

I. Introduction	3
II. The Changing Financial Landscape in China	4
A. Driving Forces.....	4
B. The New Financial Landscape	7
III. Financial Linkages Associated with the Changing Financial Landscape	9
A. The Housing Market	9
B. The Stock Market.....	12
C. Shadow Banking	17
IV. Current Institutional Arrangements	19
A. The Current Institutional Framework for Financial Stability	19
B. Coordination Mechanism	21
C. Strengths and Weaknesses of the Current Institutional Arrangements	22
V. Suggestions to Improve China’s Institutional Arrangements to Address Systemic Risk ...	23
A. Enhancing Data Collection and Sharing	23
B. Strengthening Analysis on Systemic Risk	23
C. Setting up Institutional Arrangements for Better Coordination.....	24
VI. Conclusions.....	26

Figures

1. Banks’ Off-Balance-Sheet Financing	6
2. China’s Share of Financial Assets in the World	8
3. Housing Price Increases.....	10
5. Shares of Credit in Major Industries (2014).....	11
6. Stock Prices.....	12
7. Stock Market Volatility.....	12
8. Margin Trading Balance	14
9. Interconnectedness of Stock Market.....	17

Tables

1. The Size of Banks’ WMPs.....	6
2. The Size of the Major Nonbank Financial Institutions.....	7
3. Estimates of Interconnectedness between Banks and the Stock Market	13
4. Risks in Shadow Banking.....	19
5. Stylized Models for Macroprudential Policy	25

I. INTRODUCTION

Corporations, households, governments, and financial institutions have become more financially interconnected, particularly since the early 2000s. While the changing financial landscape can bring benefits, including better risk diversification and more efficient intermediation of savings, it may also facilitate the rapid spread of disruptions across sectors, markets and financial institutions. The global financial crisis has demonstrated to the world how quickly stresses in one market segment can spread to others (Bernanke, 2012) and the need for pro-active financial stability policies (e.g., Arvai, Prasad, and Katayama, 2014). The increasingly interconnected financial system highlights the need for a better understanding of macrofinancial linkages and the importance of coordination among macroprudential and microprudential regulation and supervision, as well as fiscal and monetary policies. With this understanding, policy-makers may be better able take steps to mitigate spillovers, initiate prompt corrective prudential steps, and address adverse incentives and emerging structural and institutional distortions.

These phenomena are seen also in China, where structural change in the financial sector has been especially rapid. Two forces will drive changes in its financial landscape going forward: a slower trend of economic growth and financial liberalization. The structural slowdown of China's growth may increase credit, liquidity, and market risks, driving banks to tap into new asset classes and business models. Meanwhile, the financial liberalization has allowed more competition among banks, driving them to move beyond their simple deposit-and-loan business and spurred the growth of various nonbank financial institutions and financial markets to grow rapidly.

Meanwhile, this rapid financial diversification has created regulatory gaps and overlaps (CBRC, 2011 and CITIC Securities International, 2011), which call for more coordination among regulators. While China's institutional arrangements for coordination have improved significantly in recent years, more work is warranted. Up to now, the emphasis has been placed on the role of the respective regulators. However, strategic coordination of institutional arrangements to address changing and growing sources of systemic risk seems to be lagging behind. Against that background, this paper asks three main questions:

- How has China's financial landscape changed?
- What are the growing financial interlinkages associated with the changing financial landscape?
- How can institutional arrangements for coordination be improved to address potential systemic risk?

The paper argues that the changing financial landscape in China may give rise to systemic risk, and thus enhanced coordination in macroeconomic management is needed. In the view of the authors, China may face systemic risk arising from risks in the housing market, capital

market, and shadow banking. The paper makes the case that these sources of systemic risk can be identified and contained only through enhanced coordination among various agencies. Two major areas of coordination are particularly needed. One is to legalize data collection and sharing among regulators. The other is to strengthen coordinated and comprehensive analysis of systemic risk.

The paper proceeds as follows. Section II discusses the changing financial landscape in China. Section III investigates the growing financial linkages associated with the changing financial landscape. Section IV discusses the strengths and weaknesses of China's current institutional arrangements. Section V concludes with policy implications.

II. THE CHANGING FINANCIAL LANDSCAPE IN CHINA

A. Driving Forces

The slowdown of economic growth

A key factor behind the changes in financial landscape in China has been the gradual decrease in the rate of economic growth. The three decades of rapid economic growth has been underpinned by strong exports and investment, especially in real estate, infrastructure, and manufacturing industries. However, after decades of fast expansion, many sectors have started to exhibit severe overcapacity, declining profit, and alarmingly high leverage. On top of the overcapacity issue, others factors, including the uncertain global economic recovery, the Chinese government's intentional economic-restructuring policies, and the shift from investment-driven to consumption-driven growth, have contributed to the economic slowdown.

The economic slowdown has had three direct effects on the financial system. First, it has increased the overall level of risk. Second, because banks played a major role in financing the expansion, the economic downturn has imposed a significant burden on banks' balance sheets, driving banks to expand off-balance-sheet business, both to circumvent stringent regulation on capital and liquidity, and to tap into new clients and asset classes that are restricted by the current regulation. And, third, besides affecting financial institutions directly, the slowing economic growth also provides strong impetus for the government to reform and liberalize the financial system.

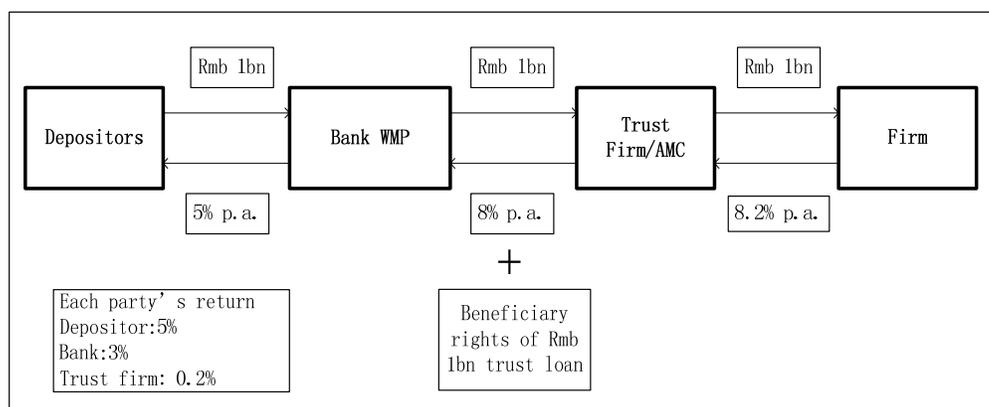
Financial liberalization

Financial liberalization in China has been carried out in three dimensions: interest rate, exchange rate and capital account liberalization; financial institutions reform; and financial markets development. In recent years the Chinese authorities have made progress in promoting the liberalization of the interest rate and exchange rate, and in opening up capital account. At the same time, there has been notable increase of various nonbank financial institutions, including asset management companies, trust and insurance. Likewise, financial

markets—the money market, bond market, stock market, and foreign exchange market—have developed rapidly.

The interest rate liberalization process was accompanied by a rapid growth of banks' off-balance-sheet financing. Before 2010, the tightly controlled bank-lending-rate floor and deposit-rate ceiling virtually eliminated the price competition among banks and therefore guaranteed banks profits. In the past five years, wealth management products (WMPs) provided an important vehicle for banks to circumvent the interest rate control, reflecting the increasing role of market forces. through this vehicle, traditional bank depositors become investors of WMPs and receive an interest rate of about 5 percent, much higher than the regulated deposit rate of 2–3 percent). The proceeds collected by WMPs are then lent to bank clients through channel institutions, such as a trust firm, an asset management corporation's subsidiary targeted asset management corporation (TAMC), or a brokerage firm's subsidiary asset-management corporation (AMC). Although most WMPs do not formally guarantee returns to investors, investors always receive the expected return and seldom suffer any loss (Standard and Poor's 2013 and Shi, J 2012). Therefore, the banks behind these WMPs still bear credit risk, even though the assets have been moved off balance sheet (Figure 1).

Although this type of banks' off-balance-sheet financing has not allowed credit risk to leave the banking, it has three advantages over the conventional on-balance-sheet financing from the banks' perspective: (1) Regulatory arbitrage. Off-balance-sheet financing allows banks to reduce their costs by avoiding the regulation on capital adequacy ratio and reserve requirements. (2) Attracting customer's deposits. The interest rate paid by WMPs is a market rate higher than the regulated deposit rate, that allows banks to attract depositors from competitors. (3) Avoiding regulation on the asset side. With the help of trust firms, broker AMCs, and asset management corporation TAMCs, banks can circumvent various restrictions on borrowers (such as real estate developers). Because of these three advantages, the WMPs have increased significantly in recent years. Table 1 demonstrates that the total amount of resources in WMPs has grown from 0.5 trillion yuan in 2007 to 15 trillion yuan by the end of 2014, accounting for 8.7 percent of the total assets in the banking sector.

Figure 1. China: Banks' Off-Balance-Sheet Financing Example

Source: Authors.

Table 1. China: Size of Banks' WMPs

Year	2007	2008	2009	2010	2011	2012	2013	2014
WMPs (in trillions of yuan)	0.5	0.8	1.8	3.0	4.6	7.1	10.2	15.0
Bank Assets (in trillions of yuan)	52.6	62.4	78.8	95.3	113.3	133.6	151	172.3
WMPs/Bank Assets (in percent)	1.0	1.3	2.3	3.1	4.1	5.3	6.7	8.7

Sources: CBRC, CSRC, PBOC, and authors' estimates.

Second, the number and size of nonbank financial institutions have increased significantly. Among these institutions, the money market mutual funds, the trust firms, the asset management corporation TAMC, and the broker AMC's have experienced rapid growth. Table 2 shows the growth of their assets under management. The asset side is mainly comprised of bonds, private loans, and trust loans. As shown, the aggregated assets of these institutions reached 29.7 trillions of yuan (or 46.9 percent of GDP) by 2014, having doubled in two years. The growth has been driven in part by banks' off-balance-sheet business, in which the nonbank institutions served as off-balance-sheet channels and in part by the regulatory gap. For example, the brokerage firms have been allowed to conduct stock market margin financing business and the trust firms have been allowed to lend to almost all legal entities. By offering investors higher-than-regulated deposit rates, these institutions have been attracting more and more bank depositors.

Third, financial markets have developed rapidly. The domestic bond issuance grew from 7 trillion yuan in 2011 to 11.9 trillion yuan in 2014. Meanwhile, the repurchase agreement (repo) market grew from 112.1 trillion yuan in 2011 to 213.6 trillion yuan in 2014. In addition, important derivative markets, such as the Treasury futures market and the interest rate swap market were established and experienced steady growth in recent years. These new

markets not only provided more flexibility to the institutions, but also exposed them to new risks, such as market volatility and funding liquidity risks.

Table 2. China: Size of Major Nonbank Financial Institutions

Institution	2012		2013		2014	
	Trillions of yuan	Share of GDP (in percent)	Trillions of yuan	Share of GDP (in percent)	Trillions of yuan	Share of GDP (in percent)
Money Market Mutual Fund	0.7	1.3	0.9	1.6	1.9	3.0
Trust Firm	7.5	14.4	10.9	19.2	14.0	22.1
Brokerage Firm AMC	1.9	3.6	5.2	9.1	7.95	12.5
Asset Management Corporation TAMC	3.6	7.0	4.2	7.4	5.9	9.3
Total	13.7	26.3	21.2	37.3	29.7	46.9

Sources: China Trustee Association, CSRC, PBOC, and authors' estimates.

In summary, the ongoing financial liberalization has brought two changes to the financial system. First, banks are facing unprecedented competition and gloomy profit growth prospect. On the liability side, not only are the demand deposits challenged by money market mutual funds, but long-term deposits are also facing increasing competition from trust firms and bond market investment vehicles. On the asset side, high-quality corporate clients are increasing their bond issuance both domestically and internationally, thereby reducing their reliance on banks.

And second, the ongoing financial liberalization has also provided flexibility for banks and nonbank financial institutions to get around the existing regulation and venture into new businesses. These challenges suggest that, despite its long-term benefit, financial liberalization could also introduce new risks, which would bring new challenges to the practitioners and regulators.

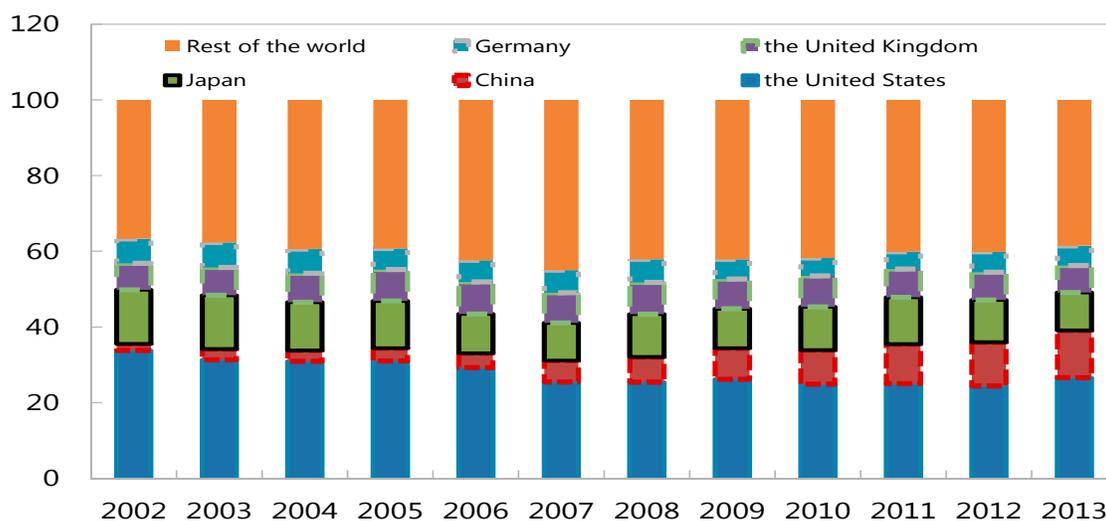
B. The New Financial Landscape

The growth slowdown and the ongoing financial liberalization has five implications for China's financial landscape.

First, China's financial system is becoming larger. The financial assets in China have grown to \$35 trillion in 2013, accounting for 13 percent of global financial assets and 371 percent of China 2013 GDP. As shown in Figure 2, China has the second highest total financial assets, outstanding only after the United States.

Second, the financial system is more diversified. One of the most important developments in China's financial system is the rapid expansion of banks' off-balance-sheet financing and nonbank financial institutions. Compared with the traditional bank-centric system, where credit is created only through bank loans, the current system allows various nonbank institutions and financial markets to play an important role in credit creation, thereby leading to a more diversified financial system. One important credit-creation indicator in China is the Total Social Financing (TSF) developed by the People's Bank of China, which attempts to measure the outstanding social credit growth in the economy including both bank credit and shadow banking credit. In 2008, 87 percent of TSF was composed of bank loans, while only 13 percent was contributed by banks' off-balance-sheet business and by nonbank financing. By 2014, the contribution of bank loans had declined to 69 percent, while other channels' share in TSF had risen to 31 percent.

Figure 2. China's Share of Global Financial Assets
(in percent)



Sources: Bank for International Settlements (BIS); Bankscope; Board of Governors of the Federal Reserve System, Flow of Funds; Bloomberg, L.P.; IMF, International Financial Statistics (IFS) and World Economic Outlook databases as of September 22, 2014; World Federation of Exchanges; and IMF staff estimates.

Third, China's financial system has become more interconnected. An increasing amount of capital moved into banks' off-balance-sheet and nonbank channels. Unlike conventional banking, these new channels often require close cooperation among financial institutions, and hence increase the linkage in the system. As a consequence, the conventional financial regulations, which are designed mainly to monitor individual financial institutions' on-balance-sheet operations, can no longer effectively gauge the scale and direction of the cross-sector or cross-market capital flows in time, thereby making the financial system increasingly opaque to regulators and investors.

Fourth, the leverage of financial institutions has increased. On the surface, many financial institutions only play intermediary roles and therefore are not directly exposed to any credit risk. In reality, implicit guarantees are often provided by financial institutions. For example,

although banks have no legal obligation to bear credit risk for their WMPs, investors widely believe that banks do provide implicit guarantees. This belief has been strengthened by past cases of restructuring troubled WMPs. Since the capital charges and liquidity requirements are different for on-balance-sheet activities from that for off-balance-sheet WMPs, banks' de facto leverage may have been underestimated.

Similar problems exist for nonbank financial institutions. For example, trust firms also provide implicit guarantees for their investors. Moreover, banks' off-balance-sheet financing often involves many nonbank financial institutions. The risk-sharing mechanism among these participating institutions is often not well defined for the purpose of avoiding the scrutiny of regulators. Therefore, in the face of major credit events, there could be legal risks related to which party should bear the loss.

Fifth, there is a higher risk of asset bubbles. With strong incentive to search for yields, these financial institutions have become increasingly aggressive in tapping into new asset classes. This makes it more likely for capital to flow into a specific market segment and fuel asset bubbles in a short period of time. The interaction between asset bubbles and financial leverage could pose significant risk to the financial system.

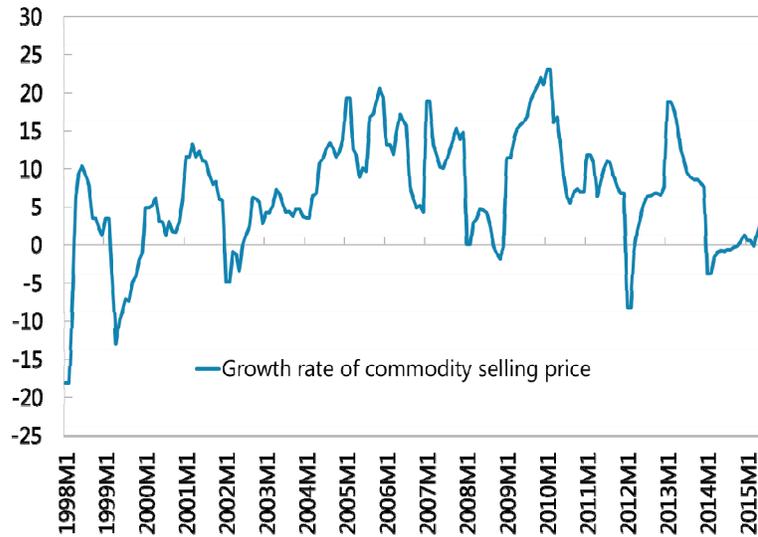
III. FINANCIAL LINKAGES ASSOCIATED WITH THE CHANGING FINANCIAL LANDSCAPE

A. The Housing Market

The housing market in China has performed strongly over the past two decades, albeit with dips in 2008–09 and 2012 (Figure 3). In fact, housing prices in China have increased more rapidly than in Korea's housing boom in 2012, and have exceeded the price increases during the housing booms in the United Kingdom and the United States before the global financial crisis in 2008.

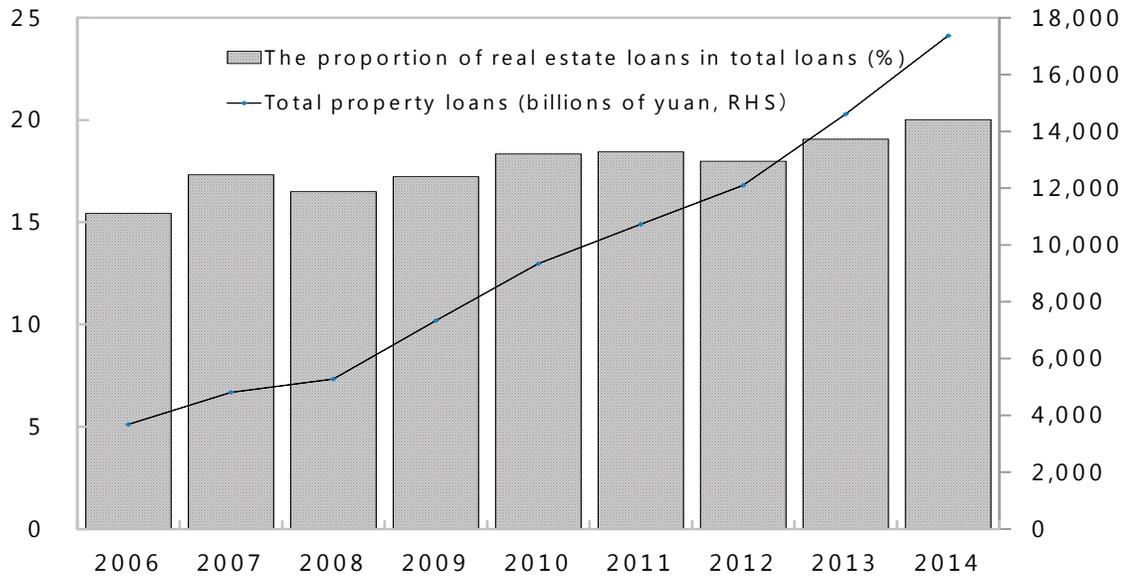
Along with the rising housing prices, real estate loans have increased rapidly. Real estate loans (including development loans and mortgages) quadrupled from 3.7 trillion yuan in 2006 to 17.4 yuan trillion in 2014, with the share of real estate loans increase from 15 percent of total bank loans in 2006 to 20 percent in 2014 (Figure4). Real estate loans accounted for the largest share of total loans among the 96 categories of industries, 10 percentage points higher than that of the second industry (Figure 5).

Figure 3. China: Housing Price Increases
(In percent)



Sources: CEIC; Authors' estimates.

Figure 4. China: Real Estate Loans

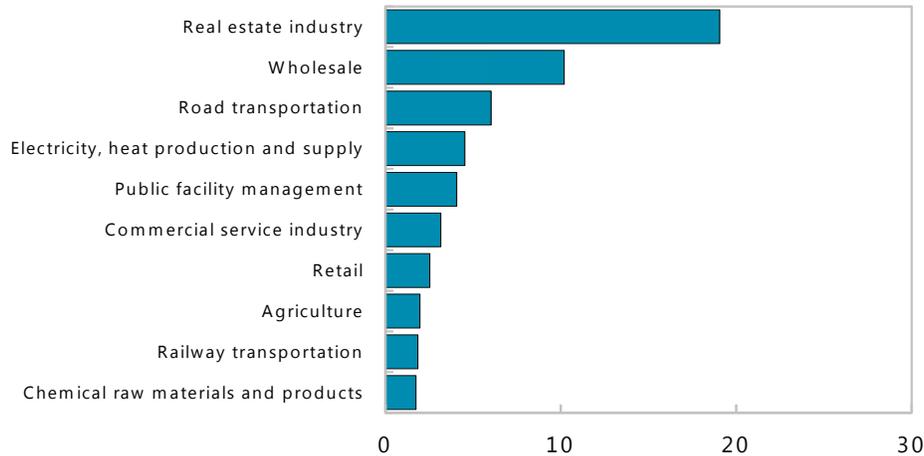


Sources: The People's Bank of China; Authors' estimates.

Along with rising housing prices was the rapid development of local government financial platforms (LGFPs). According to the National Audit Office of the People's Republic of China, the stock of local government debt increased from 10.72 trillion yuan in 2010 to 24 trillion yuan at the end of 2014, a 66.9 percent hike. Of the total debt, 23.5 percent was

invested in land reserves and social housing, and 37.2 percent was guaranteed to be paid back by land sales revenue. In fact, it is estimated that 87 percent of LGFPs' loans are related to real estate (Liao, Sun, and Cong, 2014). In addition, some part of shadow banking, (for example, trust companies) invested in real estate. As a result, real estate has become a hub of domestic interlinkages and the final collateral of multiple financing.

Figure 5. China : Sectoral Allocation of Credit



Sources: China Banking Regulatory Commission; Authors' estimates.

Note: Loans to real estate industry include real estate developer loans and mortgages.

The rapid increases in housing prices has raised concerns about the impact of a possible drop in house prices on banks' balance sheets. Anecdotal reports of speculative activity, rising vacancy rates in commercial property, sizable mortgage credit growth, and large capital inflows suggest the risk of overheating in China's real estate market. There are two important links between the real estate market and the banking sector. One is that losses from mortgage loans and developer loans could damage banks' balance sheets. The other is that a decline in land and housing prices would hamper the capability of LGFPs to pay back loans, thus undermining the quality of bank assets.²

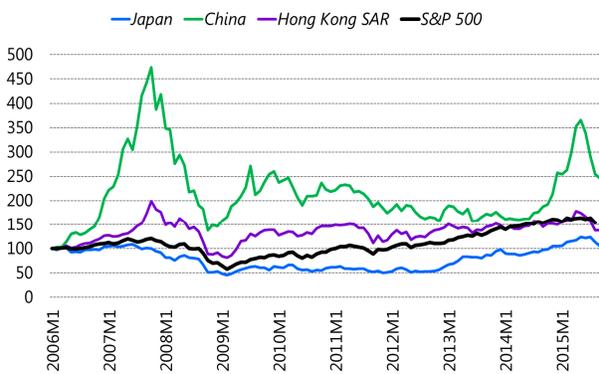
In addition, declines in housing prices would have an adverse impact on financial stability. Although the current levels of housing prices may not seem significantly higher than would be justified by underlying fundamentals (for example, real GDP per capita and population density) for China as a whole, deviation of housing prices from fundamentals is estimated to be higher in Beijing, Nanjing, Shanghai, and Shenzhen than in other cities (Ahuja and others 2010). Sharp drops in property prices may have a negative impact on government revenues, investment, and the banking sector.

² LGFPs are corporate entities set up by local governments to support project financing, particularly in infrastructure and real estate. See details in Lu and Sun (IMF, 2013).

B. The Stock Market

China's volatile stock market and its interconnectedness with other parts of the financial system is another source of risk. The 2015 stock market turbulence provides an important illustration of the risk related to the interlinkage between financial institutions and financial markets. China's equity market rose by more than 150 percent from June 2014 to June 2015 before experiencing a sharp 50 percent decline in 2015. The rapid growth before June 2015 outpaced that in many stock markets in the world (Figure 6), and was faster than that in 2007 in China. In addition, while lower than the boom in 2007, volatility was higher than in its peers, indicating higher risk (Figure 7). The sharp equity rally took place despite sputtering economic growth and shrinking profits. The rally was driven by the huge amount of capital flowing into the stock-market investments through both the regulated and unregulated financial systems.

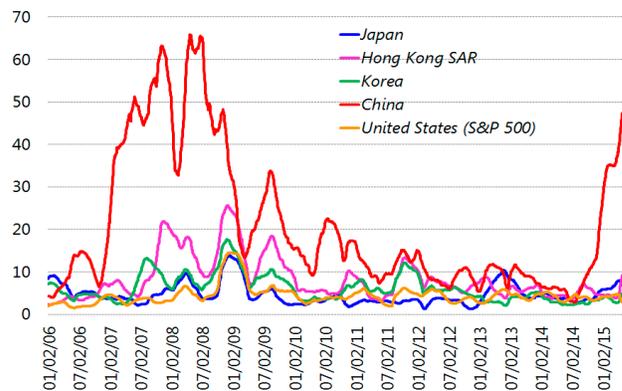
Figure 6. Stock Prices



Sources: Bloomberg L.P.; IMF staff estimates.
Note: January 2006 is taken as the benchmark date to calculate the stock price indices. Data as of September 2015.

Figure 7. Stock Market Volatility

(Begin of 2006=100; one standard deviation)



Sources: Bloomberg L.P.; IMF staff estimates.
Note: Data as of September 2015.

Increasing Interconnectedness with Banks

The stock market is highly interconnected with the rapid expansion of banks' off-balance-sheet business and nonbank institutions' activities (Table 3).

Margin financing in particular, has grown very rapidly. Since 2012, China's retail and institutional investors have been allowed to finance their purchases of stocks with a one-time leverage and an 8–9 percent annualized interest rate from brokerage firms. The margin trading balance increased sharply before June 2015, hiking from about 0.6 trillion yuan in September 2014 to 2.2 trillion yuan by June 2015.³ As shown in Figure 8, compared to the

³ The rapid expansion of margin financing is associated with the weak implementation of the strict rules on margin financing requirements. For instance, the minimum amount to open an account was required to be no

(continued...)

U.S. market, which has a stable margin balance of 2 percent free-float market cap, the margin balance in China reached 10 percent at its peak (4 percent in terms of the total market cap). Margin financing is mainly funded by WMPs, interbank lending, brokerage firm bond issuance, asset management firms, and trust firms.

Table 3. China: Interconnectedness between Banks and the Stock Market

Category	Type of Transaction	Leverage/ Total Bank Lending (RMB billions)	Connection	Legal Issue
Banks' WMPs (off-balance- sheet)	Investment	Leverage: 2–5 Size: 200–500	WMPs participate in structured investment vehicles, such as umbrella trusts, stock benefit swaps, and structural mutual funds (leverage: 2–6, size: 500).	Legal for high-value investors and institutional investors Illegal for retail investors
	Collateralized stock lending	Leverage: 0.4–0.6 Size: 800–1200	WMPs provide loans with stock as collateral.	Legal
	Margin financing	Leverage: 1 Size: 2,200	WMPs provide funding for brokerage firms' margin- finance business.	No relevant regulation
Banks' on-balance- sheet	Interbank lending	Size: 200	Banks lend to brokerage firms.	Legal
	Short-term consumer loans excluding mortgage	400	Bank lend to consumers.	Illegal
	Credit	Hard to estimate	Commercial and consumer loans were invested in the stock market.	Illegal

Source: Bank of America Merrill Lynch. "Shadow banking monitor 24, financial system vulnerable to A-share losses," July 27, 2015.

less than 500,000 yuan with a period of 18 months. However, in 2014, many securities companies opened accounts with only 50,000 yuan and a period of less than six months.

Figure 8. Margin Trading Balance: China and the U.S.

(In percent of A-share free-float market capitalization)



Sources: CEIC, NYSE, and IMF staff calculations.

Stock collateralized lending

In stock collateralized lending, brokers and banks lend to holders of listed stocks by posting their stocks as collateral. The amounts borrowed can be used to reinvest in the stock market. Although the exact amount of stock collateralized loans invested in the stock market are not available, given the rapid stock price increases between July 2014 and June 2015, the figure is likely to be large. Based on data from WIND, the Chinese market data provider, the total value of the collateralized stocks reached 2,000 billion yuan by the end of June 2015. Sixty percent of these stocks was pledged to brokers, 20 percent to banks, and 10 percent to trust companies. Although the direct exposure of bank to stock collateralized lending is not as large as for brokers and trust companies combined, since a significant share of funding for trust companies and brokers are from bank WMPs, banks' overall stock market exposure through stock collateralized lending is substantial.

Investment vehicles

There are many investment vehicles through which capital can flow into the stock market. In a typical scenario, the WMPs, the brokerage firms/asset management firms/trust firms, and the stock investors would form a mezzanine-fund type of structure. The WMPs would invest in the senior layer and receive a fixed return; the brokerage firms/asset management firms/trust firms would form the mezzanine layer and receive a higher fixed return, and the stock investors would take the residue layer. There are two widely used structures: Umbrella trusts and Stock benefit swaps.

- The umbrella trust is a trust contract that promises the senior tranche investors a fixed return (around 8–9 percent) and allows the junior tranche investors to take the risky

residual return. The junior tranche investors have access to the subaccounts established for them and invest in the stock market via these subaccounts. This arrangement essentially allows junior tranche investors to borrow money from senior tranche investors and take leverage of about 2-5 to invest in the stock market. Because a significant proportion of the senior tranches are financed by banks' WMPs, the umbrella trust provides a channel for banks' WMP capital to flow into the stock market. According to CSRC, as of June 2015, the scale of umbrella trust had reached 480 billion yuan.

- The Stock benefit swap was launched in 2013. There have been 20 brokers approved to conduct the stock benefit swap. In this business model, brokers normally acquire capital from bank WMPs through brokers' targeted asset management (TAM) programs and invest the proceeds in the stock market. The TAM programs then swap the floating return of the stock portfolio for a fixed return with the counterparties, such as the hedge funds and large individual investors. Collaterals need to be posted by the investors entering this swap contract. The swap contract essentially allows a leverage ratio around 2-4 for investors. There would be a margin call if the stock price dropped to a certain level.

Interbank lending

Brokerage firms and large asset management companies are allowed to borrow short-term loans directly from banks in the interbank lending market. When a loan matures, it can be easily rolled over under normal circumstance. Anecdotal evidence shows that, the average daily borrowing between brokerage firms/asset management companies and banks had reached a historic high level by March 2015.

Bank credit channel

Bank loans to firms could also flow into the stock market. Although the CBRC has strict regulations that forbid firms from using bank loans to invest in the stock market, it is very difficult to monitor compliance with this regulation. Many Chinese firms in the overcapacity industries are facing increasing pressure to generate profit and pay back their loans. The "easy money" in the stock market has attracted some companies to move their commercial loans into the stock market. Although it is not easy to estimate the exact scale, it is highly likely that at least part of bank lending enters the stock market (see Table 3).

Increasing Interconnectedness with the Nonbank Sector

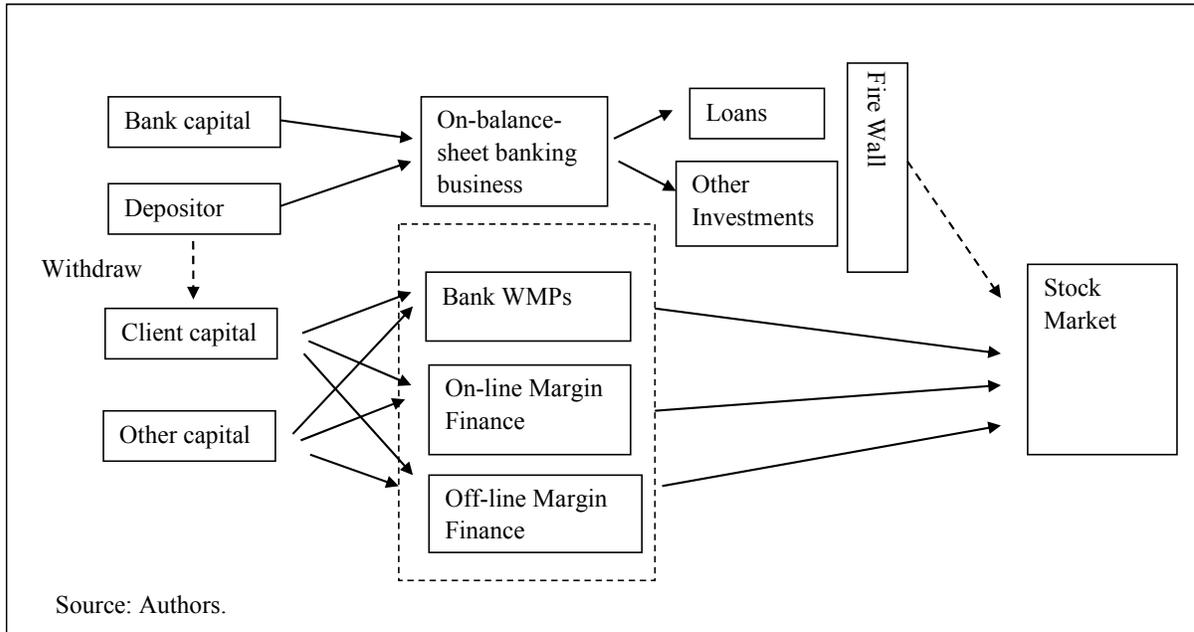
Nonbanks too are exposed to the stock market. The size of nonbank capital is smaller than banks' WMPs. However, since it allows investors, including retail investors, to take much higher leverage compared to banks' WMPs, it may have played a significant role in exacerbating the collapse of the stock market through margin call. The nonbank capital comes from multiple sources, including brokerage firms, trust firms, and insurance companies and peer-to-peer lending platform. These sources lend to stock investors not only

through channels discussed before, but also through other innovative channels, such as offline private fund matching companies and structured mutual fund companies.

The most widely used channels include structured mutual fund companies, offline fund matching companies, and the recently developed online fund matching companies. The structured mutual funds essentially allow one group of investors to lend to another group of investors at a fixed interest rate. The structured mutual fund, allowing investors to take a leverage of around 2–3, has reached to a size of more than 400 billion yuan as estimated by the Bank of America (2015). Besides the structured mutual funds, the offline private fund matching companies provide leverage up to 8–9 with interest rates reaching 20 percent annually to stock investors. Due to its opaque nature, the size of offline fund matching companies is unavailable.

One of the most remarkable developments during the stock market bubble is the online fund matching business, thanks to the peer-to-peer lending platform and the so-called HOMS system. The peer-to-peer lending platforms allow fund matching companies to attract massive individual lenders, thereby mobilizing a large amount of capital into the stock market in a short period of time. The HOMS system is an electronic financing platform that facilitates the online fund matching companies to fund and monitor each subaccount separately, while escaping the scrutiny of the regulator. The combination of peer-to-peer lending and the HOMS system has made the size of online fund matching reached over RMB 300 billion yuan before the stock market collapse.

To summarize, China's stock market has become increasingly interconnected with the rest of the financial system (Figure 9). The network among banks, brokerage firms, asset management companies, and trust firms has facilitated channeling capital very rapidly into the stock market. The investors' strong incentive to look for high-yield investment opportunities in the context of interest-rate liberalization and slower economic growth is a fundamental driving force. The financial liberalization, which allows for more financial institutions to develop ever-increasing investment vehicles, has not only helped banks shift their capital off balance sheet, but also facilitated individuals to move their money out of deposit accounts and to chase higher yields in financial markets. In the complex setup, to minimize the possibility of financial turmoil, the authorities need to develop a systemic perspective, emphasizing capital flow and interlinkages among financial institutions.

Figure 9. China: Interconnectedness of the Stock Market

C. Shadow Banking

Shadow banking has developed rapidly in China. Shadow banking is a type of funding that uses nonstandard debt instruments via nonbank financial intermediaries and bank off-balance-sheet. “Nonstandard debt instruments” refers to those not traded in the interbank market or exchange (CBRC #8, March 2013). These instruments feature high yield, less liquidity, and less transparency, with investment mainly in real estate or LGFPs. The typical nonstandard instruments include trust loans, entrusted loans, and undiscounted bank’s acceptance. “Nonbank financial intermediaries” refer to financial services firms that do not accept deposits from the general public. These intermediaries include trust companies, security asset management department and fund subsidiaries, wealth management firms, guarantors, and others (Hao, 2015).

Shadow banking has several benefits. First, it contributes to developing the capital market and reduces over-reliance on the banking system. Second, it helps diversify risks in banking sector. Third, it provides incentives for the continuum with financial reform. For example, the funding cost in trust loans and underground lending in China seem to have reflected market demand and supply, and WMPs are an effective way to circumvent the control on deposit rates (similar to the CD market in the U.S. under Regulation Q).⁴ Fourth, shadow banking has helped temporarily relieve the liquidity shortage of the financial system. For

⁴ Regulation Q was part 217 of the United States Code of Federal Regulations. From 1933 until 2011 it prohibited banks from paying interest on demand deposits in accordance with Section 11 of the Glass–Steagall Act (formally the Banking Act of 1933). From 1933 until 1986 it also imposed maximum rates of interest on various other types of bank deposits, such as savings accounts and NOW accounts

example, underground lending has become an integral part of the formal banking system by helping banks roll over bad loans via bridge loans to distressed borrowers.

However, the shadow banking system, if not well managed, may become a source of risk. Some negative feedback-loops could develop among shadow banking, commercial banks, property markets, LGFPs, and SOEs. There are many reasons for this.

- First, the shadow banking system, in general, lacks transparency. Within the system, the information disclosure of some entities, for example private equity, pawnshops, and underground lending, is relatively limited. Cash-rich companies that engage in informal lending activities carry risk as well, but their exposure levels are rather opaque. The opaqueness raises the possibility of greater unknown risks. Moreover, the introduction of electronic trading platforms and the growing use of automated calculations for computerized trades may have made liquidity less predictable (GFSR 2015).
- Second, shadow banks are often intertwined with commercial banks and corporations. Some commercial banks are shareholders of trust companies and most banks distribute trust products. In addition, many banks directly or indirectly provide shadow banking with funds, for example, through small lenders. Many of the potential bad debts in the shadow banking sector may ultimately end up on banks' balance sheets. In addition, bonds (or loans) issued by LGFPs have been bought by banks, repackaged, and sold to customers as trust products. Default risk and collateral value damage could emerge. The proceeds from the trust-product funding are often channeled to the local government and property developers. A tightened of financing conditions for local governments or a correction in property prices could trigger default risks. In addition, a correction in property prices would reduce collateral values, possibly leading to a chain reaction of defaults, property price declines, and shadow banking losses. The wide spread of informal lending practices also means that risks could quickly spread to every corner of the economy, affecting corporate balance sheets, consumer confidence, and, indirectly, bank asset quality.
- Third, shadow banking is not sufficiently regulated. Regulation and supervision in the shadow banking sector is generally loose, largely because shadow banks in theory do not take deposits. Because of this, there is high leverage in many places, but without sufficient capital to cover default risks. A few nonbank institutions are under the supervision of the CBRC, but the degree and intensity of supervision accorded to these institutions varies a lot. At present, the CBRC is responsible for supervising six types of nonbank financial institutions, including trust companies, finance companies, auto financing companies, financing leasing companies, monetary brokerage companies, and consumer finance companies. The supervisory requirements for these institutions are similar to the ones applied to the commercial banks. However, the

supervision of other nonbank institutions that grow at a fast speed, for example, loan guarantee companies and microfinance companies, is lagging behind.

- Finally, shadow banking has not received enough attention in China's crisis management framework. There is no clear mandate to provide liquidity when shocks take place. As a result, the risk of a run is logically much higher than in the official lending market. Moreover, there are difficulties to make an organized settlement, in the case of any problems arising in any part of the credit chain (Table 4).

Table 4. China: Risks in Shadow Banking

	Trust	Wealth management products	Guarantors	Small lenders	Underground lending	Pawn shops	Direct company-to-company finance	Private peer-to-peer loans	Leasing companies	Offshore borrowing
Lack of transparency	Y				Y		Y	Y		Y
Maturity mismatch		Y			Y					
Credit risk	Y	Y	Y		Y		Y	Y		Y
Liquidity risk		Y		Y	Y	Y				Y
Market risk										
Policy risk	Y	Y			Y		Y	Y	Y	Y
Customer default risk			Y	Y		Y	Y	Y	Y	Y
Regulatory crackdown			Y		Y	Y		Y		Y
Property market collapse				Y						Y

Source: Authors.

Note: Y indicates Yes; Offshore borrowing refers to illegal foreign funding of resident through nonbank financial institutions; Wealth management products refer to those financial products of banks and other wealth management companies.

IV. CURRENT INSTITUTIONAL ARRANGEMENTS

China has made progress in improving its institutional arrangements for coordination in regulating the financial system during the past decade. However, the rapidly changing economic and financial landscapes and increasing risks require further work in this area.

A. The Current Institutional Framework for Financial Stability

China's current framework for financial stabilization consists of three levels:

- A high level—the regular meetings of the top leaders of the supervisory authorities, and other related ministers chaired by the State Council.
- A middle level—the regular meetings of the monetary policy committee meetings of the supervisory authorities. In the meeting, the financial regulatory agencies regularly coordinate actions and communicate on major issues, such as financial stability, financial reform, and risk mitigation.
- A low level—regular communications between the regulators and the regulated institutions.

Although the overarching responsibility for financial stability resides with the State Council, the highest executive authority, the Law of the People's Bank of China as amended in 2003 gives the PBC responsibility for guarding against systemic financial risk and maintaining financial stability.

During the global financial crisis, responsibility for financial stability was exercised by a high-level committee of key financial agencies which was established to regularly assess conditions and consult on policy actions. Each of the agencies had contingency plans in place to respond to a crisis, including memoranda of understanding (MOUs) to promote cooperation. The efforts of Chinese authorities to rapidly deploy a range of macroprudential measures to cool overheating property markets was testimony to the strong administrative capacity of the State Council and its ability to respond to near-term systemic threats.

A key lessons of the global financial crisis, however, is that interagency cooperation must be equally effective in none-crisis periods, so that any buildup of risks can be identified and addressed well before they evolve into a systemic event. In other words, an effective macroprudential policy framework is one in which financial agencies not only share their concerns on emerging risks but also work closely together to prevent them.

The responsibility for financial stability fundamentally concerns maintaining a stable provision of financial services—credit supply, payment services, and insurance against risk—to the whole economy. From an operational perspective, in the case of China, the responsibility is largely taken by the following four agencies:

- The Law on the PBC specifically charges that institution with guarding against systemic financial risks and the maintenance of macro-financial stability. Accordingly, the PBC implemented the *Deposit Insurance Act* in May 2015 and various macroprudential policy tools.⁵ In particular, the PBC puts in place a Macro Prudential Assessment framework to pursue macroprudential policy (e.g., differentiated reserve requirements) to guard against systemic risk. Moreover, the PBC takes the lead in enhancing inter-agency coordination through the Financial Crisis Response Group directly under the State Council and the Financial Regulatory Coordination Joint Ministerial Committee (JMC).
- The China Banking Regulatory Commission (CBRC) is the prudential regulator of commercial banks and other banking financial institutions.

⁵ China launched the Deposit Insurance Act in May 2015, aimed at better disciplining its lenders and their customers. Under the plan, up to 500,000 yuan in deposits made by businesses and individuals per bank will be insured. More than 99% of depositors would be covered.

- The China Securities Regulatory Commission (CSRC) regulates the securities and futures markets.
- The China Insurance Regulatory Commission (CIRC) regulates the insurance industry.

Of the other government agencies, the most important ones from a financial stability perspective are the Ministry of Finance, whose responsibilities as fiscal agent include debt issuance and the management of state-owned assets, and the State Administration of Foreign Exchange, which has custody of foreign exchange reserves. Together these two agencies provide the government with a very substantial “financial backstop” for the financial system—the resources to intervene in times of financial stress (Hall and Sun, 2013).

Some of the recent increase in systemic risk is a byproduct of China’s successful policy response to the global financial crisis, including a large expansion in credit. Experience in both China and abroad suggests that this is likely to lead to a worsening average credit quality. Recognizing this risk, the government has tightened prudential regulations by building up reserves (through higher provisioning for nonperforming loans), adopting more stringent capital adequacy standards, placing limits on bank guarantees for corporate bonds, and tightening liquidity and diversification ratios. Banks have also been strongly encouraged to raise new capital.

B. Coordination Mechanism

An effective financial stability framework is needs to be able to discover and share information on emerging risks and develop a common approach for containing them long before the prospect of a crisis is in sight. A recent study shows that macroprudential policies are more successful when they complement monetary policy (Bruno and others, 2015). Recent experience also suggests that this process works best if one agency, the central bank, is assigned the leading role in the oversight process and is provided with an explicit mandate to promote financial stability.

Currently, interagency cooperation and information sharing in China is underpinned by a series of MOUs between the CSRC, CBRC, and CIRC. The PBC also has developed *Interim Rules on Information Sharing* with the three financial regulators. In late 2013 these financial regulators set up a joint financial stability coordination mechanism. Formal quarterly Joint Working Meetings of the regulators and joint reviews of financial intermediaries are held on a periodic basis. In addition, the Investor Protection Bureau was established in the PBC, CSRC, CBRC, and CIRC to strengthen the coordination of investor protection. Despite of these steps, there remain gaps and regulatory overlaps. It is not clear that the existing protocol would always provide each agency speedy access to the information from other sectors, that is needed to assess the overall soundness of the financial systems This is an important issue because legal hurdles and obstacles to information collection and sharing among agencies have proved to be major impediments to the early assessment of systemic

risks in many countries, notably the United States. Accordingly, there may be merit in having the PBC's access to prudential data sanctioned by legislation rather than by way of MOUs. In the same way, the regulators should have access to PBC's data.

C. Strengths and Weaknesses of the Current Institutional Arrangements

The institutional separation of functions among the PBC, CBRC, CSRC, and CIRC that characterizes China does have certain strengths. For example, each institution remains focused on its own mandate, namely preserving stability and the soundness of a type of financial institutions, which in turn facilitates keeping each institution accountable. In addition, the lack of institutional integration avoids creating a single dominant entity that over-concentrates powers, is prone to “group think,” and can be subject to political influences.

However, in our view, there are three key weaknesses of the current setup. First, there is insufficient collecting and sharing of cross-sector granular data. While all regulatory agencies are still making efforts to set up an integrated information-sharing platform, China has not established a national, credible data-collection system to gather more granular data. For example, data on match-funding in the stock market are not available.

Second, there is insufficient cross-sector analysis on systemic risk. The PBC devotes considerable resources to financial stability and publishes a comprehensive annual Financial Stability Report (FSR). However, the report could be improved in many respects, such as selection of the topics and coverage of the issues. For example, the current framework of China's report typically contains four main blocks: macroeconomic/financial environment and policies; financial markets; financial institutions; and financial infrastructure. The report could be improved by including analysis of more on the interconnectedness across sectors and markets in depth to explore the potential sources of risks. The key financial stability issues should be discussed in depth to replace the list of financial developments and risks. Moreover, room exists for improvement in the comprehensive surveillance of systemic risk. A set of strong and widely accepted indicators are urgently needed to identify and monitor systemic risk.

Third, there is insufficient policy coordination. Several characteristics of the economy, financial sector, and policy framework in China make policy coordination a particularly important policy tool. For instance, the interest rate policy is constrained by the relatively inflexible exchange rate regime, as well as the gradual opening of the capital account. Fiscal policy—particularly government spending, also has limitation as a countercyclical tool. It is not always flexible enough to prevent credit booms and the buildup of systemic risk in the financial sector. Moreover, the importance of real estate as a major asset class for resident investment, the fact that underdeveloped financial markets provide limited risk-management tools, and the shortcomings in crisis-resolution frameworks highlight the need for policy coordination to identify and monitor systemic risk in the financial system. In tranquil times,

each agency could do its job without substantial financial stability concern. In times of crisis, ministries and regulators run the risk of not being accountable for mistakes or failures. Therefore, policy coordination needs to play a major role in managing financial cycles. The increasing complexity requires further coordination in policy design.

V. SUGGESTIONS TO IMPROVE CHINA'S INSTITUTIONAL ARRANGEMENTS TO ADDRESS SYSTEMIC RISK

There appears to be four (overlapping) key elements in the institutional arrangements for financial stability: enhanced data collection and sharing, strengthened analysis on systemic risk, a clear mandate for coordinated and comprehensive analysis, and a formal mechanism of coordination or consultation across policies aimed at financial stability. It is recognized that these institutional arrangements need to be shaped by country-specific circumstances, so there can be no “one size fits all,” and international best practices are yet to emerge. Nonetheless in our view, the suggestions given below would go a long way in improving China's financial stability framework.

A. Enhancing Data Collection and Sharing

Information collection powers need to complement policy tools. Commonly shared information is a precondition for a frank and targeted policy discussion. The authority to collect information is needed to close information gaps. In order to avoid duplicative costs in the financial industry, the authorities from all agencies should obtain information that is available to other regulatory agencies, and legal impediments to such exchange of information need to be reviewed. Because financial activity can migrate in unintended ways in response to regulation, policymakers need to have the power to collect information beyond the regulatory perimeter by establishing an information collection committee or agency. It can therefore be useful to establish a broad backup power that enables the authorities to collect information directly from financial institutions, such as the information provided by financial institutions to the Office for Financial Research in the United States.

In the case of China, we would like to stress the importance of carefully monitoring liquidity conditions across a wide range of asset classes. Specifically, China would benefit from collecting systematically the following information: foreign exchange exposures of the corporate sector; household debt; cross-exposures between financial institutions; more granular, frequent, and timely statistical and supervisory data; and comprehensive transactions-based data.

B. Strengthening Analysis on Systemic Risk

Financial regulators should monitor financial risks closely, with frequent, balanced policy discussion and analysis. A key area that needs thorough policy discussion is the assessment of systemic linkages. First, market and liquidity risk may become credit risk in financial institutions. Second, a rise in system-wide counterparty risk tends to increase the risk of fire

sales of assets, leading to broader implications for all financial institutions holding similar assets and exposures. Third, a reduced risk appetite among investors and a rush to safer assets results in contagion. Fourth, the corporate sector's financial distress can be transmitted to the financial sector. Fifth, declines in the value of the assets of the nonfinancial sectors (household and corporate) and the risky debt lead to a decline in bank assets and an increase in banking sector credit risk.

The creation of task forces on specific topics would be extremely useful for cross-sector analysis. China is now facing several financial stability issues—in such areas as shadow banking, LGFPs, and external investment and financing—that need to be investigated more thoroughly. Within the current institutional setup, task forces with representatives from all relevant agencies would be able to clarify major issues and identify risks with efficiency and effectiveness.

Also, the Financial Stability Report (FSR) could be improved. Defining more clearly its focuses, collecting more detailed information, employing more thorough tools, and proposing various risk scenarios for analysis would be particularly important. In addition, the FSR needs to develop methodologies to detect systemic linkages and systemic risk. For example, stress tests could be used as early warning devices more often and network analysis could be used to model the financial system as a web of connections linking institutions.

C. Setting up Institutional Arrangements for Better Coordination

The need for coordination arises because financial stability policy interacts with other policies. The complexity requires policymakers to consider other macroeconomic policy settings—such as the prevailing monetary conditions—as well as other relevant policy settings, including fiscal, structural, and other financial sector policies—and use the policy mix that is best suited to achieving both financial and macroeconomic stability. In addition, care must be taken to ensure that macroprudential policy measures do not become a substitute for macroeconomic policy adjustments. To reduce risk, China can tailor coordination to fit its needs. A range of further mechanisms is needed to ensure cooperation in risk assessment and mitigation.

China would greatly benefit from upgrading its institutional framework for policy coordination. The new structure should ensure that each agency has an internally consistent set of objectives, so that synergies can be realized and internal conflicts avoided. In addition, the structure should allow tools to the agencies that are tasked with the relevant objective.

While varying across jurisdictions, institutional arrangements for macroprudential policy should facilitate cooperation (Table 5). Different situations in different countries result in various institutional arrangements designed to address systemic risk. In many cases, the relevant information, expertise, and regulatory powers are distributed across agencies rather

Table 5. Stylized Models for Macroprudential Policy

Features of the model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model R 1
1. Degree of institutional integration of central bank and supervisory agencies	Full (at a central bank)	Partial	Partial	Partial	No	No (Partial)	No	No
2. Ownership of macroprudential policy mandate	Central bank	Committee "related" to central bank	Independent committee	Central bank	Multiple agencies	Multiple agencies	Multiple agencies	Committee (multinational, regional)
3. Role of MOF/treasury/government	No	Passive	Active	No	Passive	Active	No	Passive (European Commission, Economic and Financial Committee)
4. Separation of policy decisions and control over instruments	No	In some areas	Yes	In some areas	No	No	No	Yes
5. Existence of separate body coordinating across policies	No	No	No	No	Yes	Yes	No	No
Examples of specific model countries/ regions	Czech Republic Ireland (new) Singapore	Malaysia Romania Thailand United Kingdom (new)	Brazil France (new) United States (new)	Belgium (new) The Netherlands Serbia	Australia	Canada, Chile, Hong Kong SAR, Korea, Lebanon, Mexico	Iceland, Peru, Switzerland	EU (ESRB)

Source: Erland and others, 2011.

than available to one organization. Therefore, the success in addressing systemic risk hinges on the cooperation of several agencies, while respecting the operational autonomy of the separate agencies. Whatever the eventual form of institutional arrangements would take, the improved institutional arrangements should be able to strengthen policy coordination and close information and regulatory gaps, in particular those regarding off-balance-sheet banking business and nonbank financial institutions.

One possibility worth considering would be to establish a dedicated financial stability council that brings together all relevant agencies to help addressing systemic risk. Committee-type arrangements could help bring together the various agencies involved so as to avoid supervisory gaps or contradictory policies. One way of doing this would be to establish a permanent Financial Stability Committee with a clear mandate to monitor systemic risk and make recommendations to address them.⁶ In the case of China, membership would include the PBC, the three supervisory agencies, and the MOF. Each agency should be authorized to receive all materially important supervisory information from other agencies.

A complementary approach would be to clarify the responsibilities and obligations of the respective regulatory agencies in the new laws and regulations. For example, the national congress could revise laws to require all regulators to coordinate to identify systemic risk by sharing information and strengthening policy coordination. Laws, such as the Law of the People's Bank of China, could be revised to involve the relevant supervisory and regulatory agencies in the decision-making process, for example, by admitting these agencies to the macroprudential decision-making body. The approach would help reconcile differences in perspective, foster ownership of decisions made by a macroprudential committee and increase compliance with the macroprudential committee's recommendations by ensuring that powers assigned to these agencies can be used in the pursuit of financial stability.

VI. CONCLUSIONS

China's financial system has rapidly morphed from an isolated, bank-dominated, and heavily regulated system into an increasingly large, diversified, and interconnected system. The transformation has improved the efficiency of the financial system and is expected to benefit the economic development over the medium term. At the same time, the rapid change has brought new risks to the system. This is especially true when the financial institutions are under increasing competition pressure to expand into riskier assets and markets, while the established regulatory framework has not kept pace with these changes.

⁶ In the US, the Financial Stability Oversight Council was established in 2010 right after the Subprime Crisis, which brings together the Treasury, Federal Reserve Board, FDIC, SEC, OCC and other major regulatory authorities. The mandate of FSOC is to identify the risks to the financial stability from both financial and non-financial organizations and respond to emerging threats to the stability of the US financial system.

China's changing financial landscape requires closer policy coordination and better information sharing. In the view of the authors, the key to fully effective financial stability framework is cooperation and coordination of the various agencies both in times of crisis and during the "good times," when the financial system is still robust but risks may be germinating. An important question for China is whether coordination arrangements, which appear to be effective in times of crisis, are equally well suited to normal operating conditions.

References

- Adrian, Tobias, and Hyun Song Shin, 2009, “The shadow banking system: implications for financial regulation,” *Financial Stability Review*. Bank of France.
- Arvai, Zsofia, Ananthakrishnan Prasad, and Kentaro Katayama, 2014, “Macroprudential Policy in the GCC Countries,” *Staff Discussion Note*, SDN/14/01, International Monetary Fund (IMF), Washington, March.
- Bank of America Merrill Lynch, “Shadow banking monitor 24, financial system vulnerable to A-share losses”, July 27, 2015.
- Bruno, Valentina, Ilhyock Shim, and Hyun Song Shin, 2015, “Comparative Assessment of Macroprudential Policies,” *BIS Working Paper*, Number 502, June.
- Bank of America Merrill Lynch, 2012, “Shadow banking: risky business”, *Investment Strategy*, 6 July.
- Bernanke, B.S., 2012, “Some reflections on the crisis and the policy response”, *Speech at the Russell Sage Foundation and The Century Foundation Conference on Rethinking Finance*, 23 April, New York, NY.
- China Banking Regulatory Commission (CBRC), 2011, “CBRC Annual Report 2011”. Citi Research (2013), “Shadow banking: to be suppressed or regulated?”, *China Economic Weekly*, 11 January.
- CITIC Securities International, 2011, “Risk analysis of informal lending market”, *Special Reports on Banking Sector Credit Risks*, No. 2, 17 October 2011 (in Chinese).
- CBRC. 2013. “Notice of the China Banking Regulatory Commission on Regulating the Investment Operations in Wealth Management Business of Commercial Banks” #8, March, 2013. (中国银监会关于规范商业银行理财业务投资运作有关问题的通知).
- Erlend W. Nier, Jacek Osiński, Luis I. Jácome, and Pamela Madrid. 2011. “Towards Effective Macroprudential Policy Frameworks: An Assessment of Stylized Institutional Models.” *Working Paper*, WP/11/250, International Monetary Fund (IMF), Washington.
- Hall, Kieth, and Tao Sun. 2013. “Strengthening China’s Financial Stability Framework, China’s Road to Greater Financial Stability—Some Policy Perspectives,” 2013, International Monetary Fund (IMF), Washington.
- Hao, Yang, 2015 (forthcoming), “Shadow Banking in China,” *FSAP Note*, International Monetary Fund (IMF), Washington.

Liao, Min, Tao Sun, and Yang Cong, “Macroprudential Regulation and Practice, China Economy Publishing House,”2014.(廖岷、孙涛、丛阳.宏观审慎监管研究与实践.北京:中国经济出版社, 2014。)

Lu, Yinqiu, and Tao Sun, 2013, “Local Government Financing Platforms in China: A Fortune or Misfortune?” Working Paper, WP/13/243, International Monetary Fund (IMF), Washington.

Shi, J., 2012, “The People’s Bank of China conducts research on informal lending”, 21 Century Business Herald, October 20, 2011. (In Chinese)

Standard and Poor’s, 2013, “Why shadow banking is yet to destabilize China’s financial system”, Credit FAQ, March 27, 2013.