

The Future of China's Bond Market

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INTERNATIONAL MONETARY FUND

THE FUTURE OF CHINA'S BOND MARKET

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and ZHANG Longmei

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Foreword

Four decades ago, China embarked on *gaige kaifang*, or “Reform and Opening Up.” The result was a growth miracle that has transformed China, and indeed the world, as the country rapidly integrated with the global economy, boosted further by China’s accession to the World Trade Organization (WTO) in 2001. China’s financial sector has also grown dramatically, though it remains relatively bank-centric and its linkages with global markets are still limited. As China moves forward with reforms and further opening, development of its capital markets—and the bond market in particular—will play a crucial role in channeling resources to the most productive uses. And as China’s bond market matures and opens up, it will become an important pillar in the global financial landscape.

The Future of China’s Bond Market starts with a review of the market’s unique development and institutional structure, which is key to understanding the main impediments to its sustained growth in an environment of financial stability. The book analyzes the different market segments ranging from China’s sovereign and credit bonds to the rapidly growing local government and green bond markets. It also covers bond futures, asset-backed securities, and offshore markets, and identifies key areas for reforms. These include measures to improve market liquidity and risk pricing, as well as removal of obstacles for domestic and foreign investors. Crucially, it also provides suggestions on how to eliminate implicit guarantees, strengthen financial stability, and improve communication.

This book includes contributions from staff of the IMF, the People’s Bank of China, the China Securities Regulatory Commission, the Ministry of Finance, and the China Clearing Depository Corporation, as well as insights from the private sector and academia. Bringing together such a diverse group of experts allows for a combination of rigorous analysis with best international practice and in-depth institutional detail, ensuring both policy and practical relevance.

I welcome this book as a prime example of the close collaboration between China and the IMF. Through our surveillance, policy advice, and capacity building efforts, the IMF has been a committed partner in China’s successful journey of reform and opening up. I look forward to continuing and further strengthening our cooperation moving forward.

Christine Lagarde
Managing Director
International Monetary Fund

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Acknowledgments

As China's financial sector continues to mature, its bond market will play an increasingly important role in allocating savings and investment and allowing for greater diversification of assets. At the same time, the inclusion of China's bonds in global indices will be another milestone in the country's integration into global capital markets, with implications for investors and policymakers alike. More than ever, these developments call for a good understanding of China's bond market structure, unique characteristics, and future reform areas, all of which are comprehensively studied in this book.

What makes this book truly unique is that it brings together authors from many IMF departments (Asia and Pacific, Monetary and Capital Markets, Research, Fiscal Affairs, and Capacity Development) as well as the People's Bank of China, the China Securities Regulatory Commission, the Ministry of Finance, the China Central Depository and Clearing Co., Ltd., the Hong Kong Monetary Authority, the private sector, and academia. Only through this collaborative effort was it possible to combine rigorous analysis with detailed institutional knowledge, which is paramount to understanding China's bond market.

The production of such a large project requires the support of many. We are thankful to the participants at the 2018 People's Bank of China/IMF Conference on China's Bond Market for their insightful comments and feedback. Special thanks go to the People's Bank of China's International Department, in particular to ZHU Jun, GUO Kai, and LIN Ran. We also thank James Daniel for his support and input, as well as the IMF Executive Director JIN Zhongxia. Besides the authors of individual chapters, the book benefited from input and comments by Changyong Rhee, Tobias Adrian, Kenneth H. Kang, Ratna Sahay, Itai Agur, Andreas W. Bauer, Jose Maria Cartas, CHEN Hongwan, CHEN Qianying, CHEN Sally, CHEN Sophia, Martin Cihak, Marcelo Dinezon, Paolo Dudine, Andrew Fennel, GAO Terry, Ziya Gorpe, HO Kenneth, Deniz Igan, Phakawa Jeasakul, Gary Jones, Honey Karun, Mariam El Hamiani Khatat, Phousnith Khay, Purva Khera, Diane Kostroch, LU Dabiao, Sole Martinez Peria, Nicola Pierri, Lev Ratnovski, Edgardo Ruggiero, Mustafa Saiyid, Aydin Sakrak, Jochen Schmittmann, Stephen Schwartz, SHI Yu, Danny Suwanapruti, TANG Mk, Andrew Tilton, Helen Wang Wagner, James P. Walsh, WANG Kebing, WANG Ying, XU Yizhi, YAN Ting, and YU Xiaoyan.

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Abbreviations

ABS	asset-backed securities
CBI	Climate Bond Initiative
CBIRC	China Banking and Insurance Regulatory Commission
CCB	China Construction Bank
CDB	China Development Bank
CDS	credit default swap
CEWC	Central Economic Work Conference
CFFEX	China Financial Futures Exchange
CFETS	China Foreign Exchange Trading System
CGB	China government bond; central government bond
CIBM	China Interbank Bond Market
CIRC	China Insurance Regulatory Commission
CIV	collective investment vehicle
CNY	Chinese yuan
CPI	consumer price index
CSRC	China Securities Regulatory Commission
DR007	7-day interbank pledged repo rate
FDI	foreign direct investment
FX	foreign exchange
GDP	gross domestic product
GFC	global financial crisis
IP	industrial production
ISDA	International Swaps and Derivatives Association
JPM GBI-EM	JP Morgan Global Bond Index-Emerging Markets
Libor	London interbank offered rate
LGFV	local government financing vehicle
NEER	nominal effective exchange rate
ODI	outward direct investment
OECD	Organisation for Economic Co-operation and Development
M2	intermediate quantitative monetary target
MPER	Monetary Policy Executive Report
NAFMII	National Association of Financial Market Institutional Investors
MLF	medium-term lending facility
MTN	medium-term note
NCD	negotiable certificate of deposit

NDRC	National Reform and Development Commission
PBC	People's Bank of China
OMO	open market operations
QFII	Qualified Foreign Institutional Investors
RMB	renminbi
ROA	return on assets
RQFII	Renminbi Qualified Foreign Institutional Investors
SAFE	State Administration of Foreign Exchange
SAR	Special Administrative Region
SDR	special drawing rights
Shibor	Shanghai interbank offered rate
SLF	short-term lending facility
SOE	state-owned enterprise
SPV	special purpose vehicle
USD	US dollar
VAR	vector autoregression
VAT	value-added tax
VIX	Chicago Board Options Exchange Volatility Index
WGBI	World Government Bond Index

PART I

Overview and Global Setting

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China's Bond Market: Characteristics, Prospects, and Reforms

Alfred Schipke, Markus Rodlauer, and ZHANG Longmei

In 2018, China marked the fortieth anniversary of “reform and opening up,” which launched a growth miracle that has put the country on a path—absent major shocks—to becoming the world’s largest economy by 2030. This rapid economic development has been mirrored in the growing size of the financial system, which is now home to the world’s largest banks and the second-largest equity market. The prospects for China’s bond market, already the third largest in the world, are the focus of this book.

Two important issues stand out: First, although China has become a main contributor to global trade and product integration, financial sector integration has been limited. Except for bank lending to some Asian and African countries, the financial system is little integrated globally and remains relatively closed. Reflecting China’s increasing global footprint, however, the next decade is likely to be driven by greater global financial sector integration. President XI Jinping made this point clear at the Boao Forum for Asia in 2018, highlighting China’s intention to further open up its financial system (XI 2018).

Second, despite its size, China’s financial system remains largely bank based. As the country seeks to improve the allocation of savings and investment to better serve the economy, the structure of the financial system is likely to change. This does not mean that the financial system will—similar to the United States—become capital-market centric. Rather, it implies that capital markets in relative terms will play a more important role in allocating savings and investment. Premier LI Keqiang reiterated this policy direction when he emphasized the government’s intention to “develop a multi-tiered capital market and promote the development of the bond and futures markets” (LI 2018, 29).

In the context of China’s global financial market integration and further capital market development, its bond market will play a critical role. The inclusion of its bonds in global indices, starting with the renminbi (RMB) sovereign and policy bank bonds in the Bloomberg Barclays Global Aggregate Bond Index in April 2019, is a milestone in global financial sector integration. This will create big opportunities for both China and the world, but requires a good

understanding of the bond market structure, its unique characteristics, and future reform areas.

Further bond market development and opening will foster the allocation of resources and allow for diversification of assets. To maximize the benefits, while minimizing risks, the process needs to be carefully managed and calibrated. It will require stronger institutions and regulation, as well as supervision and capacity building.

MACRO-FINANCIAL AND GLOBAL CONTEXT

A robust and liquid bond market will benefit the domestic economy and foster global asset diversification. It will also contribute to global stability, including through the supply of safe assets. To provide context for the discussion on the future of China's bond market, the following reviews the country's macro-financial as well as the global context.¹

Macro-Financial Context

After four decades of rapid GDP growth (about 10 percent annually, on average), the country is transitioning from high-speed to high-quality growth. But especially since the large stimulus package implemented in response to the global financial crisis of 2008–09, the country relied too much on credit-financed investment to support growth, which led to rising debt levels, increasing financial sector vulnerabilities, and deteriorating credit allocation. Corporate debt, for example, increased to about 145 percent of GDP in 2016, one of the highest levels in the world (Figure 1.1).² Associated with the rise in corporate debt was an increasingly inefficient allocation of credit.³

Faced with these challenges, in 2017, the authorities declared financial sector stability a key priority⁴ and announced a multiyear deleveraging campaign aimed at stabilizing the debt-to-GDP ratio over the next few years. This included a significant tightening of financial sector regulation and the financing of local governments. In the financial sector, the authorities announced, for example, new asset-management rules to curtail shadow banking activities. In the case of local governments, the aim has been to rein in off-budget spending by local

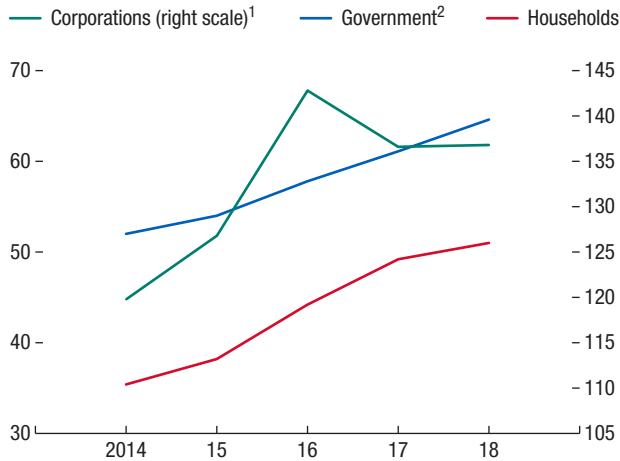
¹ On the macro-economic context see also IMF (2018).

² For surveillance purposes, the IMF includes debt issued by local government financing vehicles (LGFVs) as part of the government rather than the corporate sector. For a discussion on the perimeter of government see Mano and Stokoe (2017).

³ The overall credit intensity of the economy, calculated as total credit to the economy divided by nominal GDP, jumped from about one in 2006 to about four in 2017. See IMF (2018).

⁴ President Xi Jinping announced this as a priority in 2017 and the 19th National Congress of the Communist Party of China highlighted financial stability as one of three critical battles (see also LIU (2018). World Economic Forum. 2018. "3 Critical Battles China is Preparing to Fight." January 24. <https://www.weforum.org/agenda/2018/01/pursue-high-quality-development-work-together-for-global-economic-prosperity-and-stability/>).

Figure 1.1. Domestic Nonfinancial Sector Debt, 2014–18
(Percent of GDP)



Sources: Haver Analytics; and authors' estimates.

¹ Excluding credit to local government financing vehicles that are not recognized as local government debt.

² Including credit to local government financing vehicles that are not recognized as local government debt.

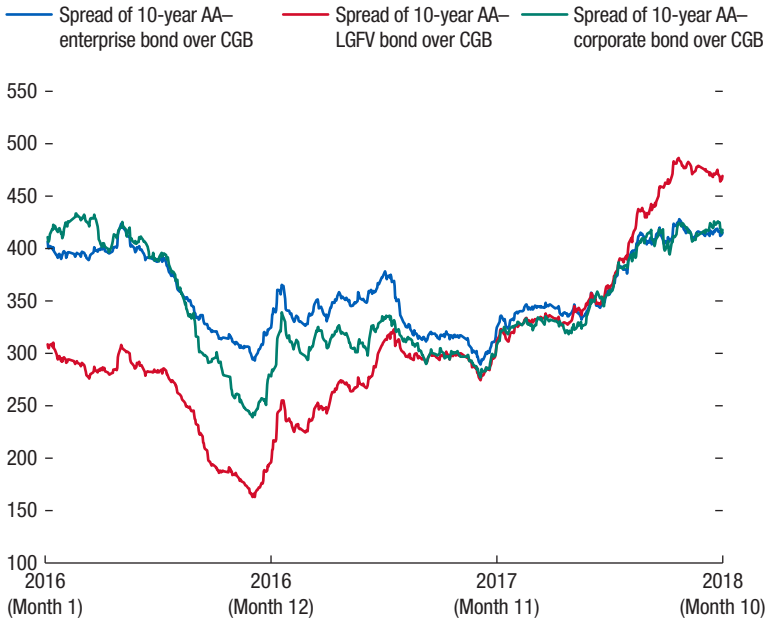
government financing vehicles (LGFVs) (see the discussion later in this chapter). Tighter regulation, in turn, was associated with a slowdown in credit growth and increased bond defaults. In addition, there was some meaningful credit spread widening affecting lower-quality borrowers (Figure 1.2). While overall default rates remained relatively low, it was the private sector, rather than state-owned enterprises (SOEs), that took the biggest hit.⁵

China's deleveraging process is likely to be calibrated over the coming years.⁶ While this might be warranted, it will be important not to undo progress in addressing leverage and financial sector risks. Ensuring financial system stability, after all—combined with better pricing of risk—is also crucial to the development of a sound bond market. This likewise calls for the implementation of complementary macro-financial structural reforms, such as imposing hard budget constraints, that is, allowing nonperforming companies, including SOEs, to exit.

⁵ In 2018, private sector default rates were estimated to have reached 4.3 percent, compared to only 0.1 percent for SOEs (see HO and CUI 2018).

⁶ For example, in light of a slowing economy in the second half of 2018, the authorities softened some envisaged financial sector reforms (largely by extending implementation periods), eased monetary policy (for example, by cutting reserve requirement rates), provided additional fiscal support (including through tax cuts), and started a campaign to provide targeted support to the private sector, especially small and medium enterprises.

Figure 1.2. Credit Spreads of Lower-Rated Companies, 2016–18
(Basis points)



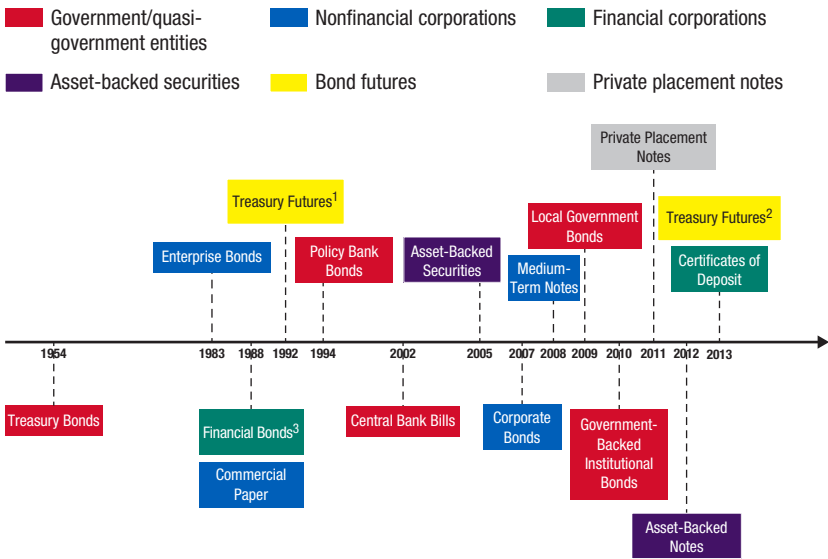
Sources: WIND Economic Database (www.wind.com.cn); and authors' estimates.
Note: CGB = China government bond.

Global Context

A further opening of China's bond market should also consider global trends and developments and, in the current context, the impact of interest rate normalization in advanced economies. This is because unconventional monetary policy in the past has been associated with significant portfolio inflows into emerging markets. While most emerging markets should be able to cope with a reversal of portfolio flows, sudden increases in risk aversion could become more challenging, including for China.

This raises questions about how sensitive China is to the global financial cycle and the implications for further liberalization (Chapter 2). Reflecting the country's still-limited exposure to foreign investors, its portfolio flows in general and debt inflows in particular are only marginally affected by the global financial cycle. Despite limited cross-border portfolio flows, however, evidence suggests that the yield curve is becoming increasingly sensitive to global factors; hence, normalization of monetary policy in advanced economies and tighter global financial conditions will have an important influence on domestic bond yields in the years ahead (Chapter 3).

Of course, with increased liberalization, it is expected that China's bond market will become more sensitive to such cycles. Some have even argued that this

Figure 1.3. Bond Market Development, 1954–2018

Source: Authors.

¹ Ceased in 1995.

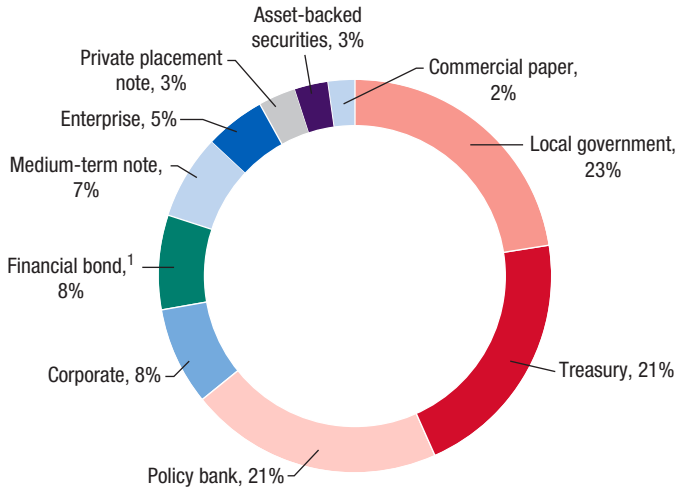
² Reintroduced.

³ Excluding policy bonds.

could lead to financial stability risks and reduce the scope for independent monetary policy (Rey 2016). But the cost, in loss of monetary policy autonomy, should be limited, especially if China continues—as it should—to move toward a more flexible exchange system supported by a well-articulated monetary policy framework and stronger financial sector regulation and supervision. The discussion that follows reviews key insights from the book chapters.

DEVELOPMENT AND STRUCTURE OF CHINA'S BOND MARKET

As is clear from the discussion so far, China's bond market is still developing. While the first sovereign bonds were introduced in 1954, it was only in 1983 that credit bonds emerged with the issuance of the first enterprise bond (discussed below) by a state-owned company to support the country's national development strategy (Figure 1.3). Since then, different segments of the market have not only become large, but also offer a wide range of products and maturities to public, domestic, and, increasingly, foreign investors (Figure 1.4). An over-the-counter market, the so-called interbank bond market, now accounts for 90 percent of bond financing and is complemented by an exchange market. As China increasingly relies on direct

Figure 1.4. Bond Market, by Bond Type, 2017

Source: WIND Economic Database (www.wind.com.cn).

¹ Excluding policy bank bonds.

financing and its bond market goes global, it will be important to understand its unique characteristics and the country's overall reform priorities. The discussion that follows summarizes the development and structure of China's bond market (Figure 1.5). It looks at (1) government and quasi-government bonds, (2) credit bonds, (3) financial bonds issued by financial institutions, (4) Treasury futures, (5) green bonds, and (6) asset-backed securities.

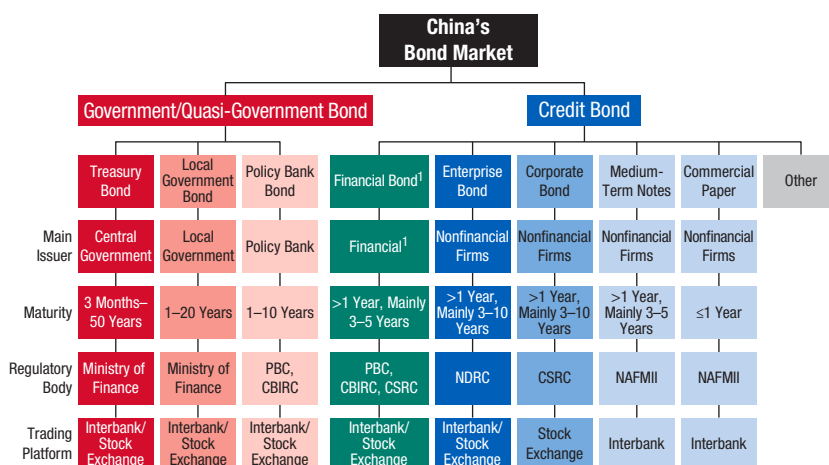
1. Government and Quasi-Government Bonds

Accounting for more than 60 percent of the total bond market, the public sector dominates the bond market, comprising sovereign, policy bank, and rapidly growing local government bond markets. Each are discussed in subsections that follow.

Sovereign Bonds (China Government Bonds)

A well-functioning government Treasury market is the linchpin for the development of any capital market, and sovereign bonds are used as a risk-free benchmark for other fixed income securities. China government bonds account for about 20 percent of the domestic bond market, with maturities ranging from 3 months to 50 years (Chapter 3). Market liquidity, however, is still thin and concentrated at the short end of the yield curve. With banks holding 70 percent of the bonds—often until maturity—secondary market trading and, hence, information processing, is more limited.

Figure 1.5. Overview of China's Bond Market



Source: Authors.

Note: CBIRC = China Banking and Insurance Regulatory Commission; CSRC = China Securities Regulatory Commission; LGFV = local government financing vehicle; NAFMII = National Association of Financial Market Institutional Investors; NDRC = National Development and Reform Commission; PBC = People's Bank of China; SOE = state-owned enterprise.

¹Excluding policy bank bonds.

Despite these shortcomings, empirical analysis reveals that the linkages between China's government bond yields and macroeconomic developments, as well as global financial market conditions, have become stronger in recent years. The information content of China government bonds has increased, with these securities anticipating changes in macroeconomic conditions. And the transmission of monetary policy to bond market yields has become stronger. For example, changes in the 7-day repurchase (repo) rate have had significant and persistent impacts on short-dated China government bond yields. Also notable is the close link between China government bond yields and external market conditions, including the 10-year US Treasury yield and the Chicago Board Options Exchange Volatility Index.

Further reforms to boost the liquidity of China's sovereign bond market will improve the overall efficiency of its capital market, providing a crucial benchmark for credit pricing that the country needs as economic reforms continue and credit allocation improves. In addition to creating a benchmark yield curve, further developing the China government bond market would enhance market liquidity by providing general collateral that can be used to broaden liquidity management (for example, repos, secured lending, and swaps) as well as the derivatives, hedges, futures, and other related markets.

Policy Bank Bonds

Policy bank bonds (part of financial bonds) play an important part in China's bond market. Since investors assume that they are backed by the government and, hence, are risk free, they are also used as benchmarks for the pricing of other securities. Unlike sovereign bonds, policy bank bonds are not tax exempt. The first policy bank bonds were issued in 1994 by the China Development Bank and now include those issued by the Export-Import Bank and the China Agricultural Development Bank.

The size of the market is similar to that of the sovereign bond market, but it turns out that policy bonds are actually more liquid. Possibly reflecting higher market trading, policy bank bonds tend to be more responsive to changes in macroeconomic fundamentals, as proxied by industrial production, as well as monetary policy signals (7-day repo rate). This reinforces the view that improving trading liquidity will be key to boosting the information efficiency and policy transmission mechanism of the China government bond market.

Local Government Bonds

China's local government bond market—regulated by the Ministry of Finance—developed almost overnight and now exceeds the size of sovereign bonds (Chapter 5). Before 2015, local governments were largely prohibited from borrowing. Instead, and especially since the large stimulus program following the global financial crisis, they have relied on off-balance sheet activities through LGFVs, effectively circumventing borrowing constraints. To reduce reliance on LGFVs and minimize financial sector risks, local governments can issue bonds subject to an annual ceiling set by the National People's Congress, a strategy introduced under the motto “opening the front door” while “closing the back door.” To facilitate the transition, the government announced a large-scale debt-swap program, reaching RMB 15 trillion (23 percent of GDP in 2017), making China's local government bond market one of the largest in the world.

Local government bonds fall into two different categories: general bonds and special purpose bonds. General bonds finance projects without expected revenue and, hence, rely on general government revenue for debt service.⁷ Special purpose bonds are expected to be repaid by project revenue and not reflected in the headline government deficit.⁸ Both general and special purpose bonds are subject to the debt ceiling set by local provincial bodies and the National People's Congress. Special project bond issuance has surged rapidly recently. Despite the rapid growth in local government bonds, nonetheless, severe impediments still hinder

⁷ China's fiscal budgets consist of four separate books. The General Public Budget covers expenditures for general public services such as national defense, education, health, and others. Government-managed funds include various funds covering expenditure on public projects such as railroads, airlines, and irrigation facilities. The State Capital Operation Budget covers expenditures in state-owned capital management. The Social Security Fund Budget covers social security expenditures.

⁸ Special purpose bonds are included in the so-called government-managed-fund budget,

bond market development, including low liquidity, weak credit culture, and a narrow investor base. It bears reiterating, therefore, that developing a sound government bond market is important for subnational government financing and securing fiscal sustainability. At the same time, structural fiscal reforms to rein in off-budget borrowing and to resolve intergovernmental imbalances between spending and revenue are necessary to contain fiscal risks.

2. Credit Bonds

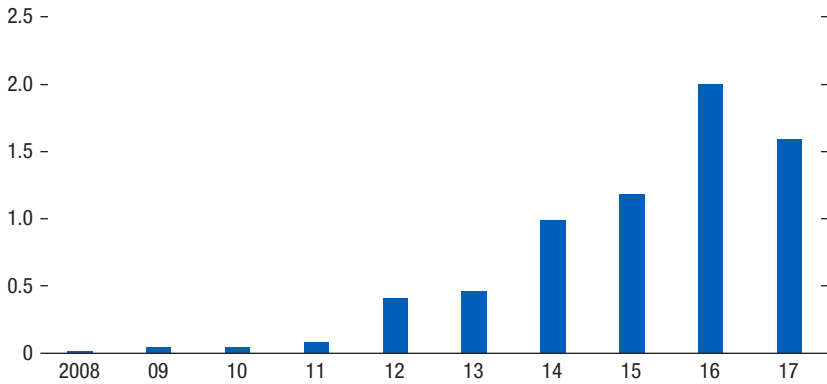
China's credit bond market is unique, reflecting its development and successive waves of financial sector development and liberalization (Chapter 4). Today, firms can issue instruments with similar characteristics and maturities in different segments, each governed by a different regulatory agency, subject to different issuance and rules, and traded on different platforms. The different segments encompass the enterprise and corporate bond markets, as well as the market for medium-term notes.

- **Enterprise bonds.** Since the launch of the first credit bond in 1983, the market has developed rapidly. The enterprise bond market is almost exclusively for SOEs (though SOEs can also issue bonds in the other segments of the market); 80 percent of enterprise bonds have been issued by LGFVs, a special type of SOE (discussed in the next subsection). Enterprise bonds are regulated by the National Development and Reform Commission, China's equivalent to a planning ministry, and issuance still needs approval. Enterprise bonds can be traded on both the interbank and exchange markets.
- **Corporate bonds.** Successive waves of financial sector liberalization have led to the establishment of new segments, spearheaded by other regulatory agencies. In 2004, the State Council issued opinions on promoting opening up and developing capital markets. Three years later, China started pilot issues of corporate bonds, which were issued and traded on the exchange market⁹ and regulated by the China Securities Regulatory Commission (CSRC).
- **Medium-term notes.** Starting in 2008, a new segment of the credit bond market was established, allowing companies to raise financing through so-called medium-term notes. Medium-term notes are formally classified as nonfinancial enterprise debt-financing instruments,¹⁰ regulated by the National Association of Financial Market Institutional Investors (NAFMII), a self-regulated agency under the People's Bank of China. These notes are issued on a registration basis and traded on the interbank market. Unlike in other countries, where the interbank market is limited to financial entities, corporations and large institutional investors have access to the market.

⁹ Certain private placement corporate bonds are traded outside the exchanges.

¹⁰ In addition to medium-term notes, nonfinancial enterprise debt-financing instruments include commercial paper, super and short-term commercial paper, asset-backed securities, and private placement notes.

Figure 1.6. Bond Issuance of Local Government Financing Vehicles (*Chengtou*), 2008–17
(Trillions of renminbi)



Source: WIND Economic Database (www.wind.com.cn).

Local Government Financing Vehicles (LGFVs)

Among credit bonds, bonds issued by LGFVs (*difang zhengfu rongzi pingtai*) warrant special discussion (Chapter 5). LGFVs are SOEs established by local governments with capital, land, or other public resources and that in turn either borrow from banks or issue urban construction bonds (*chengtou*). While *chengtou* bonds were first issued in 1992, issuance surged following the global financial crisis (Figure 1.6). Legally, they are distinct from local government bonds because they are liabilities of enterprises, albeit government-owned ones. They are issued in all three credit bond segments discussed earlier (enterprise and corporate bonds, as well as short- and medium-term notes).

Initially, local governments relied on LGFVs to circumvent the budget law, which prohibited local governments from borrowing. Markets often assume that those bonds carry an implicit guarantee by the government. In the past, some local governments even explicitly provided “letters of comfort.” However, since the 2014 budget law and subsequent reforms, the government has tried to break the perception of this link. For example, the National Development and Reform Commission and the Ministry of Finance in 2018 jointly reiterated the ban on local government guarantees for LGFVs. Although spreads have risen somewhat, no government financing vehicle has defaulted yet.¹¹

¹¹ On August 13, 2018, a short-term note issued by the Xinjiang Liushi State Capital Operating Co., an SOE perceived as a quasi-LGFV, was not paid in full. Although full payment was made three days later, market participants considered this to be the first technical default of a publicly placed *chengtou* bond. Following the news, LGFV bond spreads temporarily increased moderately but reverted quickly to previous levels.

Empirical Assessment of the Credit Bond Market

An empirical assessment using firm-level data provides valuable insights into China's credit bond market. For example, the analysis suggests that the pass-through from the risk-free benchmark rate to enterprise bonds is almost one to one, while still incomplete for corporate bonds. At the same time, credit risk seems to be more adequately reflected in the pricing of "corporate" rather than similar "enterprise" bonds. This seems to support the view that investors consider enterprise bonds, most of which are issued by SOEs, including LGFVs, as closely linked to the government. The analysis also reveals that yields of SOEs and LGFV bonds are on average some 100 basis points lower than those for private sector firms with similar financial and operating conditions. Neither enterprise nor corporate bonds, however, seem to be sensitive to liquidity risks.

All credit bonds combined still account for only a small share of corporate financing (10 percent), and foreign holdings remain negligible (less than 1 percent) compared to the United States (30 percent). In terms of investors, the market is dominated by collective investment schemes.

Hence, as the economy develops, and the financial system opens further, scope for growth is significant. For the time being, however, the credit bond market is dominated by SOEs (within all three segments of the credit bond market, SOEs accounted for about 80 percent of issuance in 2017). This is despite the fact that SOEs have become less important in the economy, contributing less than 20 percent to overall value added and employment (Lam and Schipke 2017). As such, there will be significant room for a higher share of private bond issuance going forward. At the end of 2018, the government launched a few initiatives to promote private bond issuance, including People's Bank of China liquidity support for Credit Risk Mitigation Warrants (that is, instruments that are similar to credit default swaps) and hence private bond issuance.

3. Financial Bonds

Financial bonds issued by financial institutions constitute a separate category. This category formally includes policy bank bonds, previously discussed. While banks issue in the interbank market and are regulated by the People's Bank of China, nonbank financial institutions (such as insurance companies and securities firms) can issue on exchanges and are regulated by the China Banking and Insurance Regulatory Commission and the CSRC. CITIC Group issued the first non-policy-bank financial bonds in 2001.

4. Treasury Futures

The introduction of Treasury futures in 2013 has helped enhance liquidity, improved the efficiency of price discovery, and allowed investors to better manage interest rate risk (Chapter 6). As such, Treasury futures are important in fostering development of the corresponding cash bond market (see the discussion on increasing liquidity later in this chapter). So far, the China Financial Futures

Exchange has launched 2-year, 5-year, and 10-year Treasury bond futures, with 10-year futures accounting for about 70 percent of the market and about 80 percent of daily trading volume. To ensure price convergence with the cash market, the futures market requires physical settlement based on a bond delivery basket with specified coupon and delivery maturities. Between the first and the last trading day of a delivery month, sellers of an expiring Treasury futures contract hold the right to decide when to deliver and, in 2017, delivery-versus-payment was introduced for eligible positions.

Further advances in the Treasury futures market will not only allow investors to better hedge risk, but also strengthen the underlying cash market. In particular, introducing more diversified products, such as longer-term Treasury bond futures and Treasury futures options with different terms, would meet markets' diversified risk management needs and strengthen the bond yield curve. Because about 65 percent of Treasury bonds are held by commercial banks, allowing commercial banks to participate in the Treasury futures market will contribute to better interest rate risk management and, in turn, increase the liquidity of the cash market. The same is true of foreign investors, who increasingly have access to the domestic bond market through the different quota schemes and China's interbank bond market through Bond Connect, but have not been able to participate in the Treasury futures market.

5. Green Bonds

Fighting pollution has become one of the country's top priorities and green finance can play an important role. The country's green bond market is still in its infancy but—after the People's Bank of China launched green bonds in December 2015—has already become the largest in the world (Chapter 7). Project catalogs for green bonds are published by the Green Finance Committee of the China Society for Finance and Banking. Maturities and products include short- and longer-term bonds (up to 15 years) as well as perpetuities and, more recently, asset-backed securities and green covered bonds. According to the data of CBI, China's green bonds issuance totaled RMB 248.6 billion (USD 37.1 billion) in 2017, accounting for 22% of the global issuance.¹²

Despite its rapid development, however, the green bond market still faces important obstacles. Several measures can advance the market, ranging from reducing information gaps about the benefits of green bonds, to ensuring that certification and assessment of green bonds is in line with corresponding People's Bank of China and CSRC guidelines, strengthening the due diligence of green bond issuers, and fostering information disclosure requirements.

Furthermore, the application of green bond indices and development of asset-backed securities could make the market even more attractive. As in other

¹² See Climate Bonds Initiative. "China Green Bond Market 2017," https://www.climatebonds.net/files/reports/china_annual_report_2017_en_final_14_02_2018.pdf, for additional information. The total volume of green bond issuance is according to the Chinese standards.

segments of China's bond market, it is important to increase the investor base and strengthen international cooperation on green bonds. The country's green bond market can help advance environmentally friendly growth and contribute to global initiatives in green finance.

6. Asset-Backed Securities

The asset-backed securities (ABS) market consists of both credit and corporate ABS, with the former being issued and traded on the interbank market, regulated by the People's Bank of China and the China Banking and Insurance Regulatory Commission, and the latter issued and traded on the exchange market and regulated by the CSRC. Both credit ABS and corporate ABS were formally launched in 2005 but suspended in 2009 in light of the global financial crisis (Chapter 8). A corporate ABS pilot resumed in 2011 and credit ABS resumed in 2012, and new rules and regulations were introduced (such as a requirement that each security receive two ratings) to strengthen risk prevention. At the end of 2014, the issuance of ABS changed from an approval-based to a registration-based system. Also, the types of underlying assets have been expanded and the pool of investors has grown increasingly diverse. The market now plays an increasing role in reviving illiquid assets and promoting inclusive finance. Nevertheless, it still has a lot of room to develop given the large amount of available Chinese bank credit assets and substantial corporate financing needs.

Compared to mature markets in countries such as the United States, ABS have had a late start and important elements remain to be developed. Apart from the need to strengthen legal frameworks to close loopholes and enhance certainty, market liquidity needs to be increased by promoting market makers and understandable product valuation systems and improving the structure of investors. Also, information disclosure should be strengthened comprehensively to improve transparency, timeliness, and standardization. Attention to international best practices, especially in the areas of credit rating agencies and provision of structures that ensure appropriate incentives for asset originators, would encourage the sustainable development of the ABS market.

OPENING UP OF CHINA'S BOND MARKET AND FOREIGN PARTICIPATION

The opening up of China's bond market has been integral to its broader capital account liberalization strategy, which has been gradual, sequenced, and asymmetric. Broadly in line with the IMF's institutional view on capital flow management (IMF 2012, 2017), the country liberalized portfolio flows after liberalizing foreign direct investment, and allowed inflows before outflows. A unique feature of its capital account liberalization strategy has been the use of quotas, that is, limiting the size of the flows as well as targeting particular investor groups. This strategy has also applied to bond market opening (see Chapter 9). At its inception in 2002, China allowed Qualified Foreign Institutional Investors (QFII) to invest

in its exchange and interbank bond markets through a quota system; in 2011, the Renminbi Qualified Foreign Institutional Investors (RQFII) program was introduced, allowing institutional investors to use their renminbi to invest in the domestic bond markets. In addition, since 2010, central banks and sovereign wealth funds have had unlimited access to China's interbank bond market—through the China Interbank Bond Market Direct program (CIBM Direct).

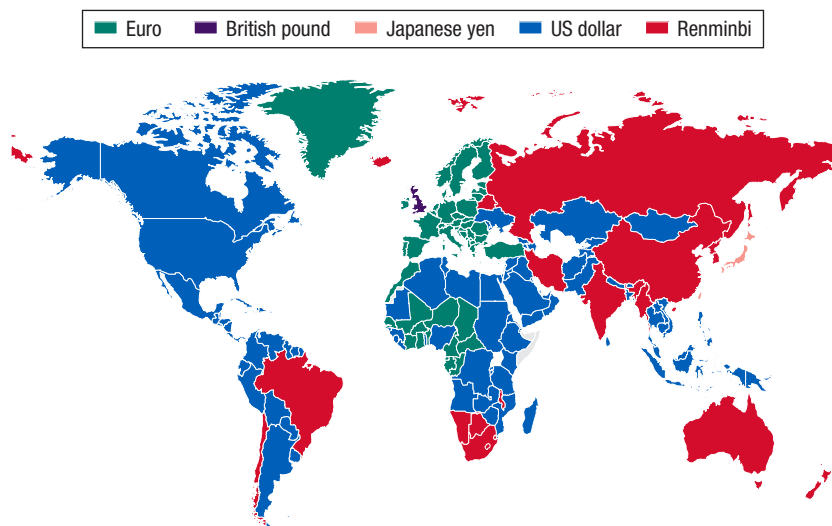
To allow renminbi-denominated bond issuance by non-Chinese entities, China launched the panda bond market in 2005. Since then, it has amended rules and regulations to facilitate market development, allowing companies, foreign banks, multilateral institutions, and sovereigns to issue the bonds. At the end of 2017, the total amount of panda bonds issued in the interbank market reached some RMB 125 billion.

The launch of Bond Connect in mid-2017, meanwhile, now allows foreign investors to buy and sell bonds traded in Hong Kong SAR and the mainland through the bond market infrastructure connect. While the program so far is asymmetric, allowing inflows (northbound), it is envisaged that further liberalization will allow residents to buy assets abroad (southbound). These measures have been associated with a significant surge in inflows. At the same time, prospects for continued large inflows remain high given that overall foreign bond holdings amount to only about 2 percent, compared to more than 25 percent in the United States and 5 percent in Korea; the global holdings of Chinese sovereign bonds, at about 7 percent, also trail other important currencies (the US dollar, Japanese yen, euro, and the British pound), which range from 10 percent to 60 percent.

RMB Internationalization and Special Drawing Rights

The inclusion of the renminbi in the special drawing rights (SDR) basket in November 2016 was a milestone for both China and the global financial system and recognized the significant advances made in China's reforms. At the same time, it was associated with operational improvements in China's bond market and has triggered a surge in global investor interest. For example, the Ministry of Finance started regular issuance of three-month China government bonds to strengthen the sovereign yield curve, along with the elimination of other obstacles, making foreign investments more attractive. Renminbi holdings by foreign central banks jumped by about 115 percent since 2016, reaching almost US\$200 billion at mid-2018, or 1.8 percent of total holdings.

Also notable is the increasing use of the RMB as a reserve currency, seen by many as evidence of the international monetary system's move away from the bipolar US dollar and the euro blocs to a tripolar system (Tovar and Nor 2018) (Figure 1.7). Also, an increasing number of central banks have increased their RMB reserve targets, including the European Central Bank (ECB 2017). Overall, China's sovereign bond holdings by overseas institutions accounted for 5.4 percent at the end of 2017. If demand for RMB bonds as official reserves were that for those of other countries (for example, Australian-dollar-denominated reserves or those of the British pound), additional inflows would be quite sizable.

Figure 1.7. Renminbi Co-Movement Block: Most Influential Reserve Currencies

Source: Tovar and Nor 2018.

Inclusion in Global Bond Indices

Inclusion in global bond indices will boost foreign participation in the sovereign bond market.¹³ In March 2018, Bloomberg announced it would include RMB government bonds and policy bank bonds in the Bloomberg Barclays Global Aggregate Bond Index beginning in April 2019. The inclusion will have a 20-month phase-in period, starting with a scaling factor of 5 percent and increasing in 5 percent increments each month. At full inclusion, China's weight would likely reach 5.49 percent of the index, the fourth-largest currency after the US dollar, the euro, and the Japanese yen, estimated to lead to inflows of some US\$90 billion–US\$130 billion during the phasing-in period.

In addition to the Bloomberg Barclays index (with assets under management of US\$2.5 trillion), there are two other major global bond indices. These include the FTSE World Government Bond Index (WGBI) (assets under management of US\$2 trillion–US\$2.5 trillion) and the JPMorgan Government Bond Index–Emerging Markets (GBI-EM) (assets under management of US\$250 billion). The inclusion of RMB bonds in these two indices could lead to passive

¹³ The inclusion in global bond indices is closely related to China's opening of its capital account. To qualify for inclusion in the Global Aggregate Index, a local currency debt market must be classified as investment grade and its currency must be freely tradable, convertible, hedge-able, and free of capital controls.

inflows of an additional US\$130 billion–US\$180 billion once the inclusion is approved.¹⁴

The Belt and Road Initiative

The Belt and Road Initiative is likely to boost transactions in both China's offshore markets and onshore markets.¹⁵ Large infrastructure gaps in partner countries generate significant demand for financing, and bond issuance can efficiently mobilize resources. Since 2017, the China Development Bank and other Chinese commercial banks have issued offshore bonds in US dollars and euros to finance Belt and Road projects, and increasingly also resort to the onshore RMB bond market.

In March 2018, both the Shanghai and Shenzhen Exchanges issued notices on the pilot of the “Belt and Road” bonds, which not only supports companies and financial institutions incorporated in countries or regions along the Belt and Road to issue corporate bonds, but also supports domestic firms to raise funds for the Belt and Road Initiative. The two exchanges are envisaging the development of a special market for Belt and Road Initiative bonds and the release of a Belt and Road Initiative bond price index. In China's interbank market, the Philippine and Hungarian governments, as well as many corporations in partner countries, have already issued panda bonds for initiative projects.

Reflecting the longer maturity of Belt and Road Initiative infrastructure projects, it will be particularly important to bring in institutional investors, such as insurance companies and pension funds, to provide stable long-term financing. Proper risk pricing of bonds related to the Belt and Road Initiative is also crucial, given repayment risks from some partner countries. To minimize risks, an overarching framework to foster coordination, as well as issues of fiscal sustainability and the framework conditions for productive investment in partner countries, will be important.

BOND MARKET DEVELOPMENT AND MARKET OPENING

In line with “crossing the river by touching the stones,” as China's successful development strategy has been described, China's financial sector reform and opening up has not been linear and has experienced setbacks and changes, most notably in 2013 and 2015–16. Given the size and increasing complexity of the financial system and China's increasing global footprint, such shifts are increasingly felt abroad. Going forward, the country's financial sector development and

¹⁴ For estimates of potential inflows, see also Suwanapruti and others (2018).

¹⁵ President XI Jinping proposed the Belt and Road Initiative in 2013. While the name refers to ancient trade routes, the initiative transcends trade and encompasses five areas to advance the initiative: (1) policy coordination, (2) facilities connectivity, (3) unimpeded trade, (4) financial connectivity, and (5) people-to-people bonds (PBC 2018).

opening up could continue to be bumpy; however, a careful sequencing of reforms, constant calibration of policies, and appropriate macro-financial management will minimize risks. At the same time, overemphasizing stability is not without cost and can lead to a mispricing of risk, misallocation of resources, depletion of buffers, and higher economic costs in the long term, including sharp adjustments and financial stress. Bond market development and opening up should therefore be accompanied by a clear strategy of containing vulnerabilities and building greater resilience (Chapter 10).

Opening Up and Removing Obstacles

Bond market development is taking place in the context of China's broader economic and financial reforms and opening up policies to establish a mature market (Chapter 9). The bond market already plays a role in market-based financing, has reduced the cost of financing, facilitates macroeconomic management, and enhances resources available to support the economy. But important shortcomings still exist. Addressing these will not only be important to maintain financial stability and promote economic development, but will also be needed to foster use of the renminbi as a reserve currency.

The reform agenda is large, but should focus on improving market access, including for foreign investors; strengthening market liquidity and risk hedging; and moving toward a multitier custodian model. Other important areas are reducing investors' information costs, as well as strengthening legal and accounting systems. And to ensure that foreign investors can confidently exit the market, a gradual further liberalization of the capital account will be needed.

From a foreign investor's perspective, many hurdles to accessing China's domestic capital market could be resolved in the short term because they tend to be more practical than regulatory or policy based (Chapter 11). Doing so would go a long way toward securing international investors' commitment to China's capital markets. Some of the obstacles, for example, include issues related to uncertainties about tax treatment. While at the end of 2018 the authorities announced a temporary three-year exemption for foreign institutional investors, many tax regulations—some of them preceding the launch of the CIBM Direct and Bond Connect programs—are difficult to interpret, leaving important questions about potential tax rates, calculation, and collection methodologies.¹⁶ In addition, while foreign official investors can access the China interbank foreign exchange and interest rate derivatives markets without constraints and foreign private sector investors can hedge in the onshore market up to the amount of their onshore cash bond holdings, in practice access has been very limited. Here, measures such as accepting the International Swaps and Derivatives Association's master agreement—in addition to the one issued by the National Association of

¹⁶ On November 7, 2018, the Ministry of Finance and the State Administration of Taxation announced that the interest derived by foreign institutional investors from investments in China's bond market would be exempt from withholding and value-added tax for three years.

Financial Market Institutional Investors—and allowing overall hedging limits at the investor or product level (that is, combining all positions under various programs) would make a big difference.

In general, fostering dialogue with market participants, particularly intermediaries such as commercial banks and global custodians, would allow authorities to issue more specific rules and guidelines on what can and cannot be done and minimize room for interpretation by the industry. In the current, increasingly stringent regulatory environment, general guidance is usually interpreted as strictly as possible by foreign market participants, making it difficult—if not impossible—for them to perform investment and hedging activities. Some practical suggestions include publishing positive lists of the practices allowed under each scenario based on real business cases and updating them regularly as new cases emerge. In addition, the authorities could consider using case studies to illustrate the required processes for application, investment, repatriation, and hedging. Experience shows that case studies are among the most effective tools to clarify rules and procedures, leading to faster take-up by the industry. Also, building on existing platforms when further opening up the domestic bond market would minimize additional setup costs.

Strengthening Financial Market Stability

The rapid development of the financial system presents constant challenges for financial regulators (Chapter 10). For example, at the end of 2016 a security brokerage firm (Sealand Securities) experienced a credit event on a repo, which quickly undermined market confidence. Banks began reducing short-term lending to nonbank financial institutions. Despite a coordinated credit rollover to prevent insolvency, interest rates surged, and repo and bond market liquidity quickly dried up.

Faced with such challenges, the Chinese authorities began tightening financial sector regulation in 2017, including by issuing new unified rules on collective investment vehicles, which had become an important vehicle for fixed income investors, as they typically promised fixed rates of return. The vehicles in turn hold most of China's credit bonds in their investment portfolios. Regular reforms have largely contained financial stability risks, but given the dynamism of the financial system, it will be important to remain vigilant, and implementation of new unified rules on asset management products will be critical. In particular, it will be important to monitor rollover, default, and liquidity risks that could give rise to bond market volatility. In the case of rollover risks until 2020, credit bond rollover requirements will be high. With tightened regulation—especially for wealth management products—but also higher interest rates driven by the global tightening cycle, low-rated borrowers could face financing difficulties.

The authorities have rightly focused on addressing rising leverage in the economy, especially in the corporate sector and related to local state-owned companies. While the default rate is still relatively low, with continued deleveraging and allowing weak firms to exit, defaults are likely to increase. At the same time,

removing widespread implicit guarantees—paramount to ensuring better risk pricing and allocation of capital—can lead to repricing of credit risk in the bond market. As mentioned, bond market liquidity is relatively low and reflects the homogeneous investor base (collective investment vehicles and banks), which tends to hold bonds to maturity. Also, given perceived low credit risk, there is little incentive to actively manage credit risks through trading. Among other things, the implementation of the new regulatory regime could increase redemption pressure and hence lead to increased volatility.

Trading Patterns

Chinese bond market trading activity—as measured by the turnover ratio—is volatile by international standards and may pose risks to financial stability (Chapter 12). Bond trading volumes tend to fluctuate in sync with funding market conditions, falling during periods of tightening monetary conditions and rising during periods of easing. This cyclical nature is likely shaped by several market structure features: the predominance of leveraged buy-to-hold investors (including investment vehicles), the lack of adequate hedging or shorting tools available to investors, and limited market-making activities.

Episodes of deteriorating bond trading volumes and market liquidity could amplify adverse shocks. In particular, the tendency for both trading and funding conditions to weaken at the same time implies that, in times of stress, market participants facing funding pressures could experience difficulties accessing liquidity when they need it most. This risks procyclical deterioration of both trading and funding liquidity that could lead to defaults. In the past, the authorities have injected liquidity to limit this vulnerability and avoid a pernicious tightening cycle. Such liquidity injections help stabilize markets but reinforce the perception of implicit guarantees.

To address financial vulnerabilities, including implicit guarantees, and enhance the transmission channel of monetary policy, Chinese policymakers should make improving bond market liquidity a priority. These measures should be aimed at increasing the availability of liquidity as well as at diversifying and broadening the investor base, especially by attracting more institutional investors, to foster demand for liquidity. Key supply-side priorities include strengthening market making and market structure, including by deepening derivatives and securities financing markets. Demand-side efforts should revolve around measures to broaden the set of investors sensitive to market prices, including foreign investors.

Harmonizing Regulation

As mentioned, China's bond market is regulated by a multitude of agencies: the People's Bank of China, the China Securities Regulatory Commission, the National Development and Reform Commission, and the Ministry of Finance; the National Association of Financial Market Institutional Investors also assumes part of the regulatory role through registration-based practices. The current

regulatory structure is a reflection of China's financial sector reform and liberalization strategy, as well as political economy considerations. For example, at a time when the CSRC was focusing on the development of the equity rather than the bond market, the People's Bank of China pressed ahead and established a separate interbank bond market.

Today, differences in rules and regulations are associated with higher information costs, market segmentation, and the potential for regulatory arbitrage. This calls for a harmonization of rules and regulations of, for example, bond issuance and information disclosures across different credit bonds. In September of 2017, an interministerial committee spearheaded by the People's Bank of China was tasked to work on unifying regulation.

Rating Agencies and Rating Issues

A well-functioning credit rating industry is crucial for the development of bond markets. In China, ratings from approved agencies are mandatory for most bond issuance,¹⁷ and often must meet a minimum rating requirement. Reflecting the development of the bond market, the rating industry has also gone through rapid expansion; at the end of 2017, there were 12 rating agencies (10 are domestic firms and 2 are joint ventures with foreign rating agencies). Until recently, while foreign rating agencies were permitted to rate Chinese bonds directly, these ratings were not recognized in the domestic market for regulatory purposes. Foreign investors—in turn—could only hold minority shares in joint ventures rather than majority-owned rating agencies.¹⁸ The nascent rating industry faces a few issues.

First, ratings of credit bonds appear highly skewed, with more than 95 percent of credit bonds rated AA or above, compared to less than 6 percent in the United States. This reflects both stringent issuance requirements and implicit guarantees constraining private sector access; in effect, China has been lacking a high-yielding market. Interestingly, though, despite the condensed rating distribution, there are relatively large variations of credit spreads within each rating category (Chapter 4). There is also a lack of dynamic adjustment in ratings, as often bonds are still rated at investment grade right before a default.

Second, reflecting the segmentation in the credit bond market, the regulation of rating agencies is also highly segmented. Rating companies need approval from different agencies to rate different types of credit bonds. For example, they need the CSRC's approval to rate corporate bonds and the National Development and Reform Commission's approval to rate enterprise bonds. Reflecting the

¹⁷ There are unrated private placements though.

¹⁸ Since April 2018, China has announced additional opening up measures, including removing foreign shareholding limits in the automobile industry, banks, and financial asset management companies, among others.

complicated approval process, so far only three rating agencies have approvals from all regulators and can rate the whole universe of credit bonds.¹⁹

Following further opening measures in 2018, the three major global rating agencies (S&P, Moody's, and Fitch) applied for licenses to establish wholly owned companies in China. Once established, these will help strengthen the credit culture and rating quality in the industry. The government has started to unify the regulation of rating agencies in the interbank and exchange markets, which will greatly benefit the rating industry and potentially lead to some consolidation within the industry, as the numerous agencies currently operating provide opportunities for rate shopping.

SUPPORTING REFORMS AND STRENGTHENING POLICY FRAMEWORKS

China's bond market development is intricately linked to the successful implementation of supporting reforms, including strengthening corporate governance, reforming SOEs, and enacting measures to ensure the integrity and reliability of information about the performance of entities that issue bonds. As in any country, many of these reforms are difficult to implement because they face significant opposition from entrenched interest groups and, hence, require determination and political capital. In addition, communicating these steps ahead of time, combined with increasing consumer education about the rewards and risks of different types of financial investment, is also key.

Among measures that can be taken are tapering implicit guarantees, improving monetary and exchange rate frameworks, fostering communication, and strengthening capacity development.

Tapering Implicit Guarantees

The perception of implicit guarantees is deeply entrenched in the financial system, fostering widespread moral hazard and excessive risk taking by households, corporations, local governments, and financial institutions (Chapter 13). In the corporate bond market, such guarantees are evidenced by the low bond default rate, generous credit ratings, and compressed risk premiums. Even though the central government has repeatedly stated its ban on local government guarantees of corporate debt, SOEs and LGFVs are still largely shielded from default risk.

The dependence of local governments on central government fiscal support to achieve annual growth targets in the past highlights the challenge in dismantling implicit guarantees.

The authorities have taken steps to develop the institutional framework necessary for effective implementation of the corporate insolvency framework,

¹⁹ China Chengxin International Credit Rating and China United Ratings conduct ratings on the exchange market through their subsidiaries.

including enhancing the capacity of the judiciary to handle insolvency cases. And the number of insolvency cases has been increasing significantly, while until 2016 there were very few (Figure 1.8). Nonetheless, the total default rate in the corporate bond market remains low and the correlation between bond spreads and default events is still weak.

Careful sequencing of reforms is therefore needed to dismantle implicit guarantees. Radical change of the perception that guarantees are in place could lead to disruptive withdrawals—such as by retail investors from investment products or by short-term repo lenders—and quickly undermine the solvency of financial institutions and corporations. But implementing reforms gradually, before lifting implicit guarantees, could mitigate risks. Critically, these sequenced reforms should include strengthening market discipline and making further progress on developing legal and institutional insolvency frameworks that can promote timely restructuring of viable companies while ensuring effective and speedy exit of nonviable (zombie) firms.

Other reforms include improving data quality, increasing bank capital buffers to absorb losses associated with the removal of implicit guarantees (IMF 2017), establishing a financial sector resolution framework (including a robust framework for bond defaults at a time of potential market stress), and taking further steps to develop the institutional framework for corporate insolvency by enhancing the capacity of the judiciary to handle insolvency cases.²⁰ These steps should go hand in hand with strengthening the social safety net so that, as incentives to keep nonviable firms open are eliminated, hardships on the population are minimized.

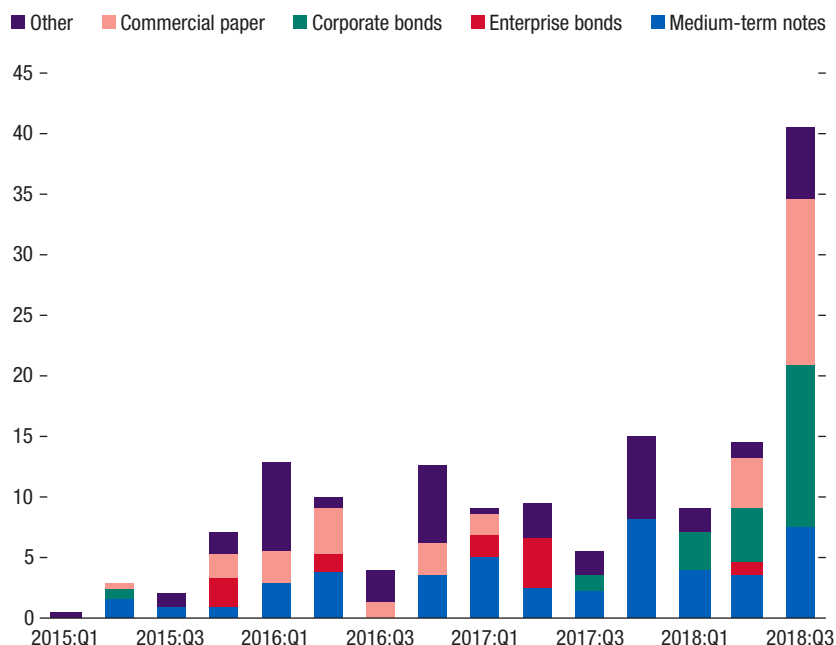
Improving Monetary and Exchange Rate Frameworks

The development of a country's bond market and strengthening of its monetary policy frameworks are mutually reinforcing. On the one hand, a developed bond market helps in the efficient transmission of monetary policy to the economy; on the other, a modern interest rate-based monetary policy framework supports the development of bond markets.²¹

In China, successive waves of interest rate liberalization have facilitated the transition to such a modern, price-based monetary policy framework (Chapter 14). While this process is not complete, the government in 2018 reiterated its commitment to deepen reforms and to make interest and exchange rates more market based (LI 2018). More recent progress, for example, includes deemphasizing

²⁰ China's 2016 Enterprise Bankruptcy Law does not seem to deviate too much from best international practice. At the same time, it is a very concise law that might not provide responses for many complex problems in insolvency practice. See Maliszewski and others (2016).

²¹ Developing a robust CGB market would also have macroeconomic implications for fiscal policy and public debt management. Further strengthening the fiscal framework would also enhance market stability and macroeconomic policy effectiveness (see van Eden, Gentry, and Gupta 2017).

Figure 1.8. Credit Events, by Issuer, 2015–18*(Billions of renminbi)*

Sources: WIND Economic Database (www.wind.com.cn); and authors' estimates.

quantitative targets such as M2 (a broad measure of money supply that covers cash in circulation and all deposits) and total social financing.

Building on the progress made, managing liquidity by targeting a short-term interest rate—such as the 7-day interbank reverse-repo rate—and allowing other rates along the yield curve to adjust based on market conditions will strengthen monetary policy transmission and, hence, bond market development. These steps should be combined with less reliance on window guidance and deemphasizing benchmark interest rates.

As noted, bond market opening is part of China's strategy to liberalize its capital accounts. Further capital account opening in turn needs to be carefully sequenced. Among other things, and in addition to an effective monetary policy framework and a resilient financial system, this calls for increased two-way exchange rate flexibility. This will minimize the risk from further global financial integration and ensure that monetary policy can respond based on domestic economic conditions.²²

²² See IMF (2018) for further discussion of strengthening China's policy frameworks.

Fostering Communication

Bond markets transmit important signals of monetary policy to the broader economy. To increase the effectiveness of monetary policy and reduce financial market volatility, central banks increasingly use communication as an important lever (Chapter 14). The same is true for the People's Bank of China. The People's Bank of China also increasingly uses social media, where China already has more followers than the US Federal Reserve, the European Central Bank, and the Bank of England combined. Further strengthening China's monetary policy communication will not only increase the efficiency of monetary policy, but will also positively affect bond market development itself by reducing uncertainty, making it more attractive for both domestic and foreign investors.

An empirical event study analyzing the impact of China's traditional monetary policy communication channels on financial markets shows that changes in policy instruments are associated with market news (see Chapter 14). At the same time, they do not move the market too much, suggesting that the effectiveness of the People's Bank of China's communication remains limited.²³ The release of the quarterly Monetary Policy Executive Report in turn reduces market volatility, suggesting that it contains operational details and sometimes forward guidance. Furthermore, oral communication through public speeches and press conferences calms markets. However, it is irregular and usually determined by market conditions. That even relatively small improvements in communication can be very beneficial is reflected in the impact of short "informative notices" that since 2016 have accompanied the People's Bank of China's open market operations. These short notices have strengthened the transmission channel of People's Bank of China intervention to the market.

Overall, the analysis suggests that while the People's Bank of China has made several improvements to its communication, it has not yet become as potent a policy tool as in many advanced economies and some important emerging markets. Greater operational central bank independence and transparency would help improve the effectiveness of the People's Bank of China, including through forward guidance. Even though institutional changes take time and require significant political capital, "low-hanging fruit" exists that could be implemented quickly, such as making information available in a timely fashion, in one place, and in English; expanding the People's Bank of China's economic forecasting capacity and publishing forecasts regularly (as was done by the Bank of England before its independence), as well as making information available about the associated framework and models; and holding regular press conferences.

²³ Traditional channels are Monetary Policy Executive Reports, press releases on monetary policy committee meetings, and speeches and press conferences. A novel channel is open market operation notices, with daily notices standard since January 2016. To better explain the rationale for these operations, the notices increasingly provide contextual information, such as, "given ample liquidity, the PBC intervenes to keep liquidity stable."

More recently, the People's Bank of China has taken additional steps to guide market expectations, including through more press conferences and interviews, explaining deeper analysis, and more informative Monetary Policy Executive Reports. In addition, at the end of 2018, the central bank set up a new working group to translate policy statements and news releases into English to better provide information to international investors (Bloomberg 2018).

Strengthening Capacity

The advent of new financial products often leads to a migration of risks, regulatory arbitrage, and the development of new risks that need to be monitored and appropriately regulated. Case studies from other countries show how important it is that financial sector liberalization and development is not only accompanied by a constant upgrading of regulation and supervision, but also by strengthening the capacity of regulators and supervisors.²⁴

As noted, China's bond market has developed very rapidly. This trend is likely to continue and be combined with the development of new and more complex products and markets such as the derivatives market. The latter will be important to boost bond liquidity and allow investors to better hedge risks. Yet, as in other countries, these developments present constant challenges for regulators and supervisors. As highlighted in the 2017 Financial Sector Assessment Program (IMF 2017), an important challenge is staffing. Headquarters staffing at key regulatory agencies, such as the CSRC, the China Banking and Insurance Regulatory Commission, the People's Bank of China, and the Ministry of Finance, is very small in absolute and relative terms (between 700 and 1,000 people). In addition, the staffing levels have remained broadly constant despite the rapid development of the bond market (Figure 1.9).

Thus, adequate headquarters staffing will be critical, along with relevant practical market experience, to stay current. This requires competitive salaries to retain qualified staff, as well as staff with both domestic and global market experience.

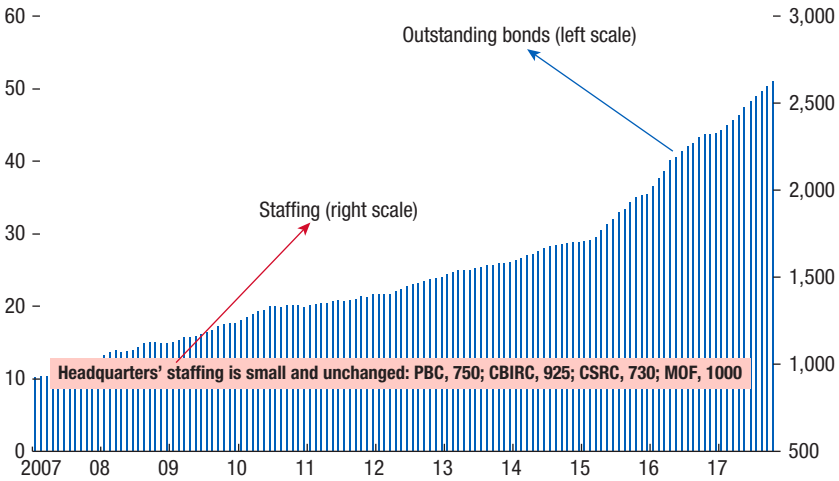
OFFSHORE MARKET

China's domestic (onshore) bond market development has been intricately linked to its offshore market. Some of China's onshore market reforms and opening up, for example, were guided by prior offshore market experiences. Also, in line with the capital account liberalization strategy, China first allowed domestic corporations to tap offshore markets (in both renminbi and in US dollars) before opening up its domestic bond markets to foreign investors. The offshore market will

²⁴ A well-known example of how developments—following financial sector regulation—can lead to financial stress and the mushrooming of new financial products without upgrading the capacity, resources, and incentives of regulators and supervisors is offered in the United States savings and loan crisis in the 1980s (Mishkin 1999).

Figure 1.9. Bond Market Development and Headquarter Staffing of Regulators, 2007–17

(Trillions of renminbi, left scale; number of staff, right scale)



Sources: People’s Bank of China (PBC); China Banking and Insurance Regulatory Commission (CBIRC); China Securities Regulatory Commission (CSRC); and Ministry of Finance (MOF).
 Note: In 2018, the China Banking Regulatory Commission and the China Insurance Regulatory Commission were merged to become the new China Banking and Insurance Regulatory Commission. In the process, overall staffing was reduced by about 12 percent.

continue to complement the onshore market and play an important role in guiding domestic (onshore) bond market reforms.

Offshore Renminbi Dim Sum Bonds

As in other countries, foreign investors can use offshore markets to raise funds and increase their exposure to a country. This is especially true for the Hong Kong SAR offshore market, where bonds can be issued in renminbi, usually known as dim sum bonds (Chapter 15).²⁵ While the first dim sum bonds were issued by the China Development Bank in Hong Kong SAR in 2007, reforms that allowed direct investments—initiated by the People’s Bank of China and the Ministry of Commerce in 2011—initially fostered the rapid growth of the dim sum bond market. This allowed foreign companies in search of offshore renminbi funds to support business in the onshore market (foreign direct investment) and for mainland firms to support outward direct investment through Hong Kong SAR.

Since then, the universe of dim sum bond issuers has diversified and now includes multinationals, mainland Chinese companies, and companies doing

²⁵ Dim sum bonds draw their name from a popular Hong Kong SAR dish. McDonald’s was the first foreign nonfinancial company to issue a dim sum bond, in 2010.

business in Hong Kong SAR. Mainland Chinese firms often set up subsidiaries or special purpose vehicles to raise funds. For this reason, almost 30 percent of bond issuers are nonbank financial institutions. Real estate companies in turn also play an important part, comprising almost 20 percent of bond issuers.²⁶

An empirical analysis suggests that onshore-offshore yield differentials, outward direct investment growth, and mainland China's macroeconomic conditions are key factors driving the dim sum bond market. So are the renminbi nominal effective exchange rate and hedging costs, as well as policy uncertainty. The growing integration of capital markets between mainland China and Hong Kong SAR, such as through the launch of the Bond Connect program, is expanding the choice of renminbi assets available to offshore investors. Given the free flow of capital, a highly accessible market, and internationally recognized strong legal and regulatory frameworks, even with a further opening of the onshore financial markets, the dim sum bond market is likely to remain an attractive platform for international and mainland issuers to tap renminbi funds outside China.

Offshore Corporate Dollar Bonds

Like the dim sum bond market, China's offshore corporate dollar bond issuance has increased sharply, especially since 2012.²⁷ This trend took place against the backdrop of rising capital flows to emerging market economies, as well as China's own efforts to liberalize its capital account.

Firm-level analysis suggests that the surge in China's offshore corporate dollar bonds in 2012–15—and the subsequent contraction in 2015–16—resembled the characteristics of carry trades, in line with experiences in other countries (Chapter 16). Evidence is strong of cyclicity in US dollar bond issuance/redemption by Chinese nonfinancial corporations, which also has driven China's capital account balances in recent years. US dollar bond issuance tends to rise when China's economic policy uncertainty is low, global financial market conditions are accommodative, and the renminbi is strengthening against the US dollar. The analysis also suggests that there are differences across sectors, possibly reflecting firms' different business models and their unequal access to domestic financing sources. In addition, US dollar bond issuance is negatively correlated with firms' external financial dependence. This is consistent with the pecking-order

²⁶ In addition, offshore Treasury bonds are an integral part of the dim sum bond market, serving as a pricing benchmark. In 2009, the Ministry of Finance issued RMB 6 billion Treasury bonds in Hong Kong SAR with maturities of two, three, and five years, marking the launch of the offshore China government bond market. Since then, RMB China government bonds have continuously been issued in Hong Kong SAR, becoming an important part of dim sum bonds and providing benchmark pricing for the market.

²⁷ Offshore Treasury bonds in Hong Kong SAR also include China government bonds issued in US dollars. In October 2017, the Ministry of Finance issued \$2 billion Treasury bonds in Hong Kong SAR, with maturities of 5 and 10 years, marking the launch of the offshore dollar CGB market in Hong Kong SAR. It was the first dollar-denominated bond issuance since 2004 and helped to provide a benchmark for the pricing of offshore corporate dollar bonds.

theory that the offshore bond market is usually the last resort of financing for corporations. It is surprising that US dollar bond issuers tend to invest less in fixed assets and inventories—another sign that firms tend to view access to the offshore dollar bond market as a channel to conduct carry trade activities rather than as a financing source to support investment.

Since the surge in China's offshore corporate dollar bonds demonstrates characteristics of carry trade rather than longer-term corporate investment, and to the extent that associated capital flows could carry risks for macroeconomic and financial stability—especially if they are large and volatile, as demonstrated by the large swings of China's capital account balance between 2013 and 2015—they need to be carefully managed. Primarily associated capital flow pressures should rely on macroeconomic policies, including an effectively floating exchange rate (IMF 2018). Further strengthening of micro- and macroprudential frameworks could mitigate the procyclical buildup of systemic risk over the financial cycle. The “macroprudential assessment framework for cross-border financing” that the Chinese authorities have developed since 2016 is more predictable and transparent than the previous capital flow management framework and can be used to address risks arising from excessive cross-border financing and mismatches (that is, currency, maturity, on/off balance sheet), but should not be used to actively manage the capital flow cycle and substitute for exchange rate flexibility.

Going forward, the liberalization of China's capital account should be gradual, carefully sequenced, and paced with supporting reforms that include an effective monetary policy framework, a sound financial system, reduced fiscal dominance, and more exchange rate flexibility (IMF 2018).

CONCLUSIONS

The future of China's bond market is bright, and its continued development and further opening will bring significant benefits for China and the world. But this needs to go hand in hand with a strengthening and harmonization of financial sector frameworks, supportive macrofinancial structural reforms (including removing implicit guarantees, imposing hard budget constraints, and strengthening corporate governance), the elimination of obstacles for both domestic and foreign investors, good communication, and better capacity building. The following chapters analyze the country's bond market in depth and—based on best international practice—make practical policy recommendations.

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China's Bond Market and Global Financial Markets

Eugenio Cerutti and Maurice Obstfeld

INTRODUCTION

Sustainably integrating China into the global economy has been a pivotal event in recent decades and will continue to lead global economic developments. Trade and production integration naturally came first as market-based reforms began more than four decades ago, but integration into global financial markets is now assuming central importance. Smooth integration will ensure that world resources are channeled to their most productive uses globally and that global risks are efficiently shared across countries and sectors. Both China and its trading partners stand to benefit from these developments.

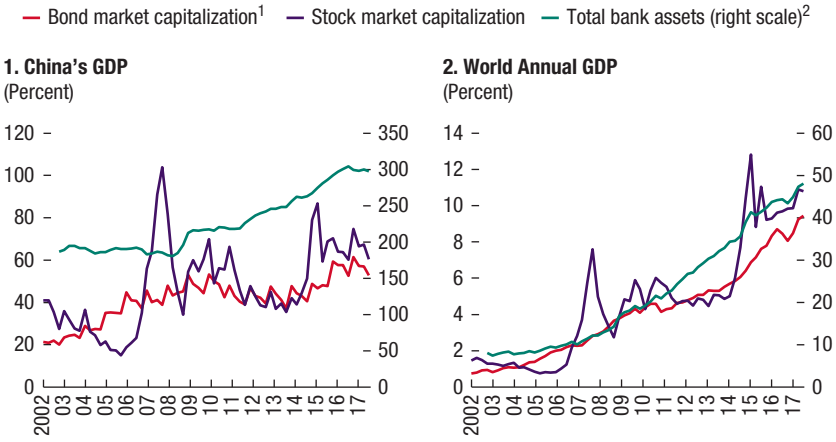
This chapter offers a preliminary assessment of the potential for China's further integration into global financial markets—especially into the international bond market—and highlights the possible challenges of further financial integration.

The chapter uses a two-step approach. The first half benchmarks the increasingly central role of China in global financial markets by analyzing China's evolving stock and bond markets, as well as by comparing them to those of key international markets, such as the United States, the euro area, Japan, and regional peers like India and the Republic of Korea. It then analyzes foreign participation in Chinese bonds as well as bond yield differentials (such as differences between foreign-exchange-hedged and unhedged yields). The results make clear that further successful liberalization of the Chinese bond market would need to encompass not only the bond market itself, but also further development of other markets, notably the foreign exchange market.

The second half of the chapter focuses on the potential challenges of further international integration of the Chinese bond market. The ongoing normalization of US monetary policy, for example, could pose risks for many emerging market economies, including China. The chapter therefore explores the sensitivity of

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Figure 2.1. China's Bond and Stock Market Capitalization and Bank Assets, 2002–17



Sources: CEIC; IMF *World Economic Outlook*; and authors' calculations.
¹ Bond market capitalization based on data coverage from the China Central Depository and Clearing Co., Ltd.

China's capital inflows to the global financial cycle and evaluates how this could increase as integration proceeds. It concludes that room is ample for further integration, especially in the bond market, but this process cannot occur in isolation, given the broader economic integration necessary for sustainable efficiency and stability.

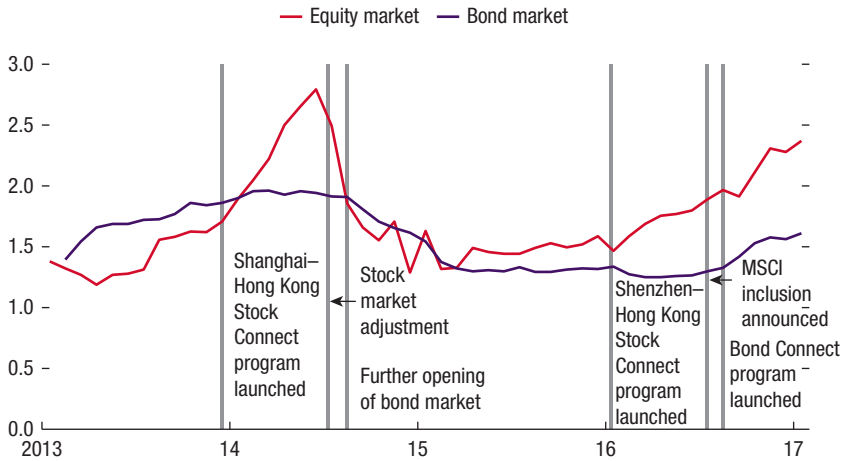
CHINA'S FINANCIAL MARKETS IN THE GLOBAL CONTEXT

Figure 2.1 illustrates China's increasing importance in global financial markets, reflecting the growth of its financial markets relative to the size of the real domestic economy (panel 1) and the fast-growing real economy itself, with its rising ratio to world GDP (panel 2). Chinese bond market capitalization grew from about 1 percent of global GDP at the start of the 2000s to 9 percent by the end of 2017.

Rising stock market capitalization is a bit smaller but still striking, reaching about 10 percent of global GDP in 2017 from about 2 percent of global GDP in 2002. Much more impressively—but also pointing to potential financial stability challenges—the assets of the Chinese banking system skyrocketed from 1 percent of global GDP in 2002 to almost 50 percent in 2017.

At the same time, foreign participation in China's stock and bond markets has risen, although it remains relatively low compared with international peers. Helped by landmark reforms in Chinese financial markets (such as the

Figure 2.2. Foreign Participation in China's Stock and Bond Markets, 2013–17
(Assets held by overseas entities as a percentage of market size)



Sources: CEIC; People's Bank of China; and authors' calculations.

Notes: Data are for December of each year. MSCI refers to the Morgan Stanley Capital International Emerging Markets Index.

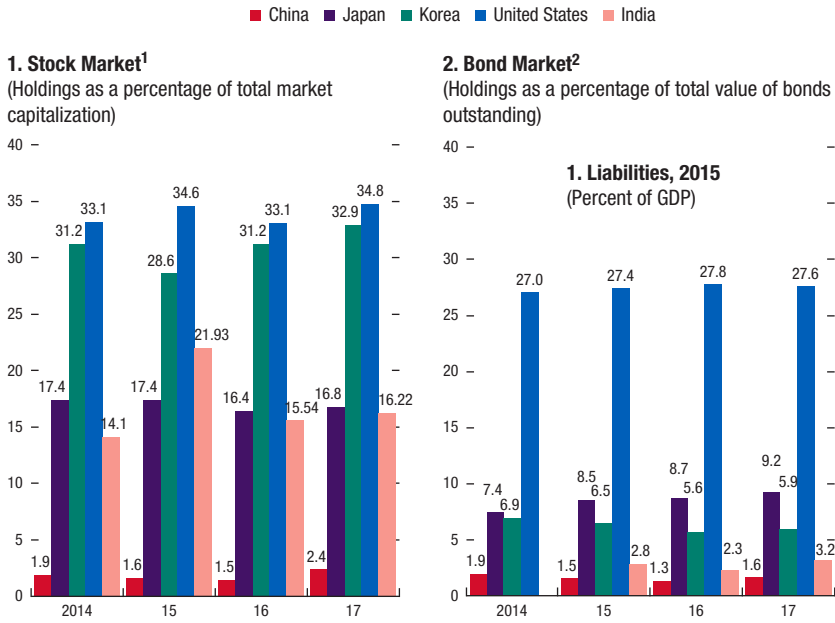
Shanghai–Hong Kong and Shenzhen–Hong Kong Stock Connect Programs), as well as by the inclusion of Chinese equities in the MSCI index,¹ foreign participation in the Chinese stock market increased slightly in recent years (see Figure 2.2). Foreign equity holdings are about 2.4 percent of total Chinese equity market capitalization. Foreign participation in Chinese bond markets is similarly small, at only about 1.6 percent of the total value of bonds outstanding, with that share remaining stable in recent years.

In contrast, as Figure 2.3 (panel 1) shows, foreign participation in the stock markets of the United States (about 35 percent in 2017), Korea (33 percent), and Japan (17 percent) is much more important than in China. Only foreign participation in India's stock markets is comparably limited (2.8 percent in 2017). The evidence is similar for the bond market (panel 2), with foreign participation in China's bond markets substantially below its peers, including India.

Limited foreign participation in China's financial markets is also visible in IMF balance of payments data, highlighting the wide scope for further external integration of those markets. The international investment position of China as

¹ SUN (2015) describes the recent reforms. The inclusion of around 230 mainland-listed stocks in the MSCI index took effect on June 1, 2018. Initially, the share of Chinese A-shares amounted to about 0.7 percent of the MSCI index, with a future full inclusion weight of about 18 percent. Whereas Chinese bonds are not now included in any global index, if included, their index weight would be about one-third of the widely followed J.P. Morgan Emerging Markets Bond Index Global, according to the IMF's April 2016 *Global Financial Stability Report*.

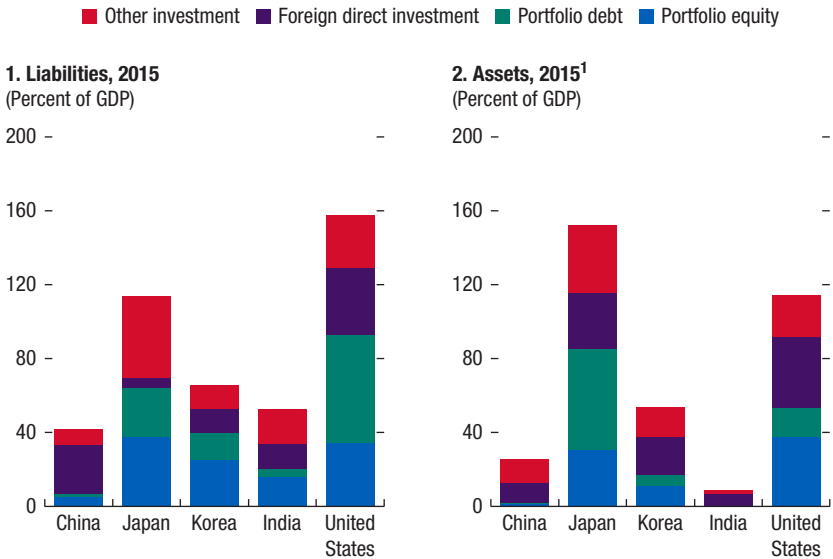
Figure 2.3. Foreign Participation in China's Stock and Bond Markets, 2014–17



Sources: Bank of Japan; CEIC; Financial Supervisory Service, China; Financial Supervisory Service, Republic of Korea; Haver Analytics; Ministry of Finance, Japan; People's Bank of China; Reserve Bank of India; Securities Industry and Financial Markets Association; US Department of Treasury; and authors' calculations.
¹Data as of end of fiscal year (March) for India.
²Data for India include only government securities.

of 2015 showed that its liabilities to foreigners (claims of nonresidents on Chinese residents) were about 40 percent of domestic GDP (Figure 2.4, panel 1), substantially below the levels of the United States (about 160 percent of GDP) and Japan (115 percent), as well as Korea (65 percent) and India (55 percent).

The composition of these liabilities across countries also reflects the scope for further integration of China in both equity and, especially, bond markets. The share of portfolio equity and bonds is just one-fifth of total Chinese external liabilities, a much lower share than for the United States (three-quarters of total external liabilities), Japan (three-fifths of total external liabilities), Korea (three-fifths of total external liabilities), and India (two-fifths of total external liabilities). A similar picture (Figure 2.4, panel 2) prevails on the asset side (Chinese residents' holdings of foreign assets), highlighting the still-modest external diversification of Chinese wealth, especially of portfolio equity and debt.

Figure 2.4. International Investment Position, 2015

Sources: Lane and Milesi-Ferretti 2017; IMF, Balance of Payment Statistics; and authors' calculations.

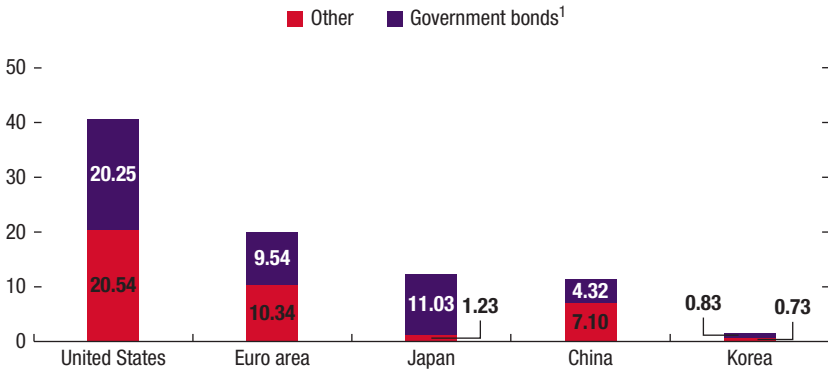
¹ Assets are net of reserves.

FURTHER LIBERALIZATION OF CHINA'S BOND MARKET

So, while the overall size of financial markets in China has grown, foreign sector participation has increased only slightly and international integration relative to peer economies remains low. This section explores the characteristics of the country's bond markets and the types of bonds that might attract foreign investors through further cross-border liberalization.²

² As in other countries, foreign investors could also increase exposure to a particular country through offshore markets. For China, this is especially the case through the offshore markets operating in Hong Kong SAR, where bonds can also be issued in renminbi—usually known as dim sum bonds (see Chapter 14). Nonetheless, the small foreign participation in the Chinese onshore bond market does not seem to be driven by the availability of bonds in these offshore markets. In addition to maturity considerations (that is, maturities are often shorter in offshore markets), the activity in these offshore markets is influenced by both the offshore issuance of bonds by Chinese companies that need to be authorized by the National Development and Reform Commission (China's economic planning ministry and regulator for enterprise bonds), and net renminbi outflows from the mainland, which provide a large part of the liquidity and are also regulated from the mainland. Moreover, the launch of the Bond Connect program—which liberalizes some regulations by allowing institutional international investors to trade onshore bonds through Hong Kong SAR—has increased foreign holdings in onshore markets in 2018, according to Hong Kong Exchange (2018).

Figure 2.5. Total Value of Bonds Outstanding at the End of 2017
(Trillions of US dollars)



Sources: Bank of Japan; Financial Supervisory Service, Korea; European Central Bank; People's Bank of China; and Securities Industry and Financial Markets Association.

Note:

¹ Government bonds cover bonds issued by the general government (central, state, and local government accounts; social security funds; and nonmarket, nonprofit institutions controlled and mainly financed by government units).

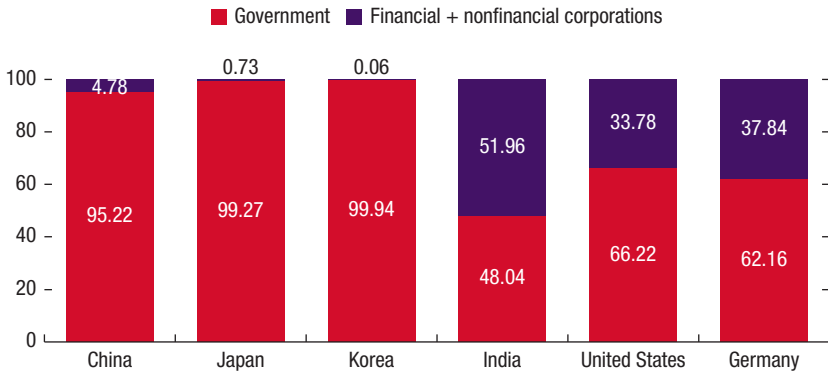
Chinese bonds outstanding at the end of 2017 were high in absolute terms, with a stock of about \$11 trillion at the end of 2017 (Figure 2.5), more than Korea (about \$2 trillion), and similar to Japan (\$12 trillion), but not comparable yet with the euro area (\$20 trillion) or the United States (\$41 trillion).

Unlike Japan, Korea, and even the euro area and the United States, the issuers of Chinese bonds are more concentrated in the nongovernment sector (although for China that includes important state-owned enterprises and various government-sponsored vehicles). Nonetheless, most foreign holdings of Chinese bonds are concentrated in government instruments (Figure 2.6). This situation resembles that of Japan and Korea, but is far from those of the United States, India, and euro area countries such as Germany, where nonresidents contribute a substantial fraction of the private sector's bond financing.³ In this context, further liberalization of the bond market in China could help the private sector diversify funding, improve liquidity, and lengthen borrowing maturities.

In terms of pricing, the evolution of the Chinese bond yield curve reflects higher nominal yields than either US or euro area bonds, as well as a degree of comovement in the evolution of Chinese yields relative to those countries despite China's closed capital account. Figure 2.7 depicts the bond yields in April 2018,

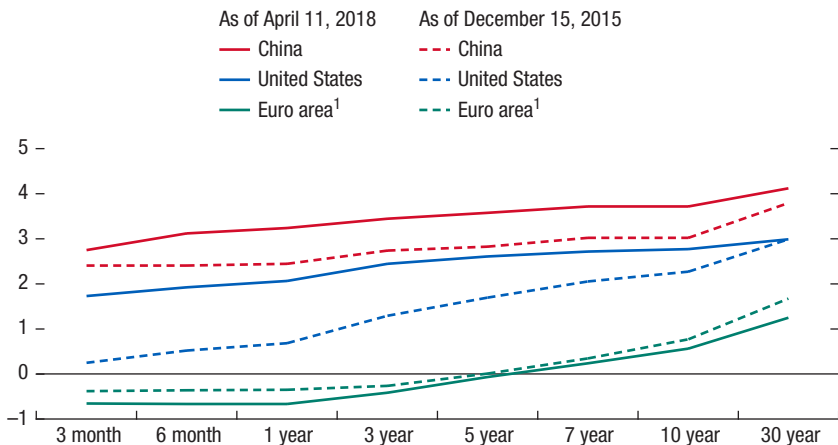
³ The May 2017 Research Report of the Hong Kong Exchange finds that foreign financial institutions tend predominantly to hold Chinese sovereign bonds and the most highly rated corporate bonds as part of their renminbi reserves because of China's weak market infrastructure, particularly the rather low credibility of local credit rating agencies.

Figure 2.6. Foreign Holdings, by Type of Bonds, 2016
(Percent of total)



Sources: U.S. Department of Treasury; Haver Analytics; Deutsche Bundesbank; Bank of Japan; Financial Supervisory Service, Korea; Reserve Bank of India; National Securities Depository, India; and authors' calculations.

Figure 2.7. Yield Curve of Government Bonds, 2015 and 2018
(Percent)



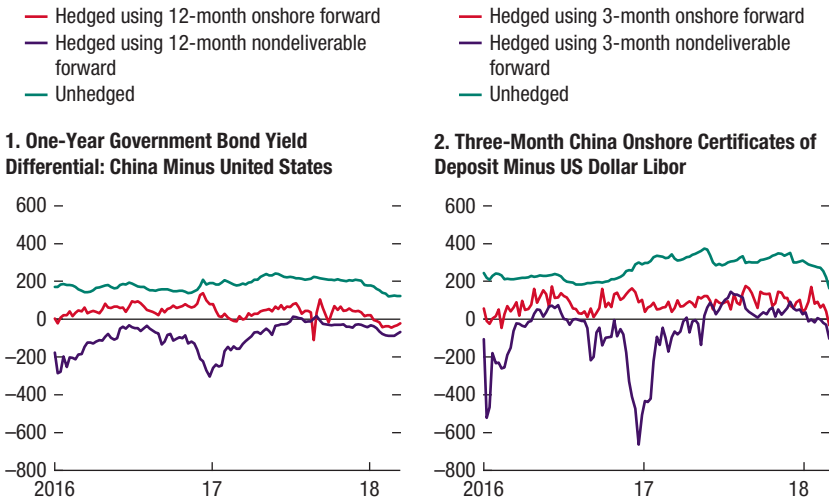
Source: Bloomberg L.P.

¹ Based on euro area AAA-rated government bonds.

as well as the yield curve before the beginning of monetary normalization in the United States in December 2015 (depicted by the dashed lines in Figure 2.7).

Synchronized yield developments between China and the rest of the world do not necessarily imply the existence of big cross-currency arbitrage opportunities, because of both remaining capital controls and the relatively high cost of hedging

Figure 2.8. Foreign Exchange Hedged and Unhedged Yield Differentials, 2016–18



Sources: Bloomberg L.P.; China Foreign Exchange Trade System; and authors' calculations.
Note: Libor = London interbank offered rate.

currency risk. Figure 2.8 captures the relative hedged yield differentials between similar Chinese and US government bonds, using either onshore or offshore forwards.⁴ The hedged China-foreign yield differentials are not as positive as the unhedged ones, especially when using nondeliverable offshore forwards (depicted by the green lines in Figure 2.8). Comparing covered 12-month with 3-month differentials, shorter maturity investments hedged onshore look somewhat more attractive to foreign investors.⁵

⁴ A forward foreign exchange contract is an obligation to purchase or sell a specific currency on a future date for a fixed price set on the date of the contract. In the context of this chapter, while onshore forwards refer to contracts made in mainland China, offshore forwards cover contracts in international financial centers, such as Hong Kong SAR. A nondeliverable forward (NDF) is similar to a regular forward foreign exchange contract, except at maturity the NDF does not require physical delivery of currencies.

⁵ MA and McCauley (2014) also document that the renminbi is priced more cheaply onshore than offshore in the foreign exchange forward markets (as in Figure 2.8, as shown by the higher cost of hedging using NDFs compared with onshore forwards). They associate this phenomenon with an appreciation of the renminbi and net private capital inflow pressures whenever the capital account opens up in China. Their projections for net inflows contrast with both HE and others (2012) and Bayoumi and Ohnsorge (2013), who project large increases in gross external positions (both assets and liabilities), but with private assets increasing more than liabilities. Estimating the net impact of further financial market liberalization is beyond the objectives of the chapter and constitutes a very complex task, especially given that relationships estimated with historical data would not necessarily be good predictors of the final direction of capital flows after structural policy changes—which, in any case, will not necessarily be implemented all at once.

In this context, it could be envisaged that the successful liberalization of the Chinese bond market would encompass not only further regulatory measures linked to the bond market itself (that is, by allowing further foreign participation in terms of buying and issuing bonds onshore), but that the resulting inflows and outflows of bonds would depend on several factors, including covered interest parity considerations, where both interest rate differentials and foreign exchange market considerations are important.⁶

MARKET OPENING AND INCREASING EXTERNAL INFLUENCES

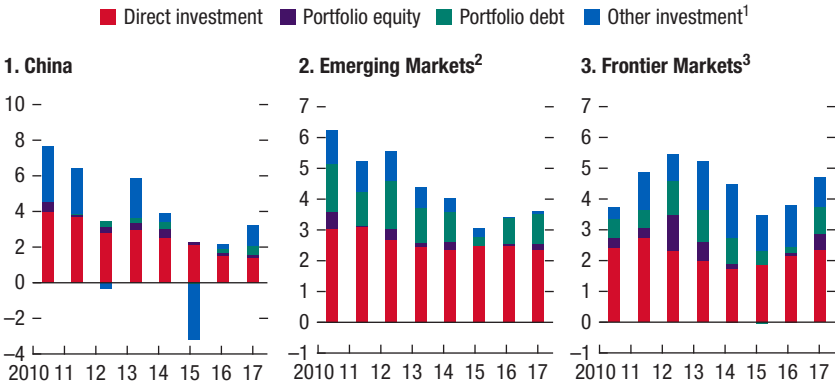
Further capital account liberalization, including deepening of the bond market, would increase the impact of current policies in key global financial centers (the euro area, Japan, the United States) on capital flows to China. While the capital flows literature (for example, Calvo, Leiderman, and Reinhart 1993) has covered the role of a number of external variables—variables now usually labelled as “push” factors—a consensus has emerged on the role of US monetary policy (including unconventional monetary policies, as reflected in Fratzscher, Lo Duca, and Straub [2018]), risk aversion (as captured by the US Chicago Board Options Exchange Volatility Index, or VIX, as stressed by Forbes and Warnock [2012], among others), and the US dollar exchange rate (Bruno and Shin 2015) in helping explain the synchronicity of capital flows to emerging markets.

Despite continuation of the US monetary policy tightening that started at the end of 2015, an interesting feature of the global economic expansion of 2017 is that capital inflows to both emerging and frontier markets rose. Figure 2.9 (panel 1) shows that this was also the case for China, which experienced an increase in bank-related inflows (captured under “other investment”) and, to a lesser degree, in portfolio equity and debt inflows.

A large part of capital inflow behavior in recent years has been related to unconventional monetary policy in the United States. Figure 2.10 (panel 1) illustrates that US unconventional monetary accommodation (as in an expanding Federal Reserve balance sheet) has underpinned a significant portion of portfolio inflows to emerging markets. Both elevated global risk appetite (proxied by low US VIX levels) and domestic pull factors explain the 2017 increase in capital inflows to emerging market economies. Overall, these model estimates suggest that the expected steady pace of Federal Reserve policy normalization over the next few years (both through balance sheet reduction and a rising federal funds rate) could reduce portfolio flows by a cumulative \$75 billion by late 2019

⁶ Absent counterparty risk, covered interest rate parity is a pure arbitrage relationship that links the premium of a currency's forward over its spot exchange rate to its nominal interest rate advantage over foreign currency (see Cerutti, Obstfeld, and Zhou [2019] for more details).

Figure 2.9. Gross Capital Inflows, 2010–17
(Percent of GDP)



Sources: IMF, *World Economic Outlook*; IMF Balance of Payments Statistics; and authors' calculations.

¹ Other investment includes mostly bank-related inflows.

² Emerging markets data do not include China.

³ Frontier market economies are defined as *World Economic Outlook* low-income economies included in the Morgan Stanley Capital International Frontier Markets Index: Bangladesh, Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Kenya, Mali, Niger, Senegal, Togo, and Vietnam.

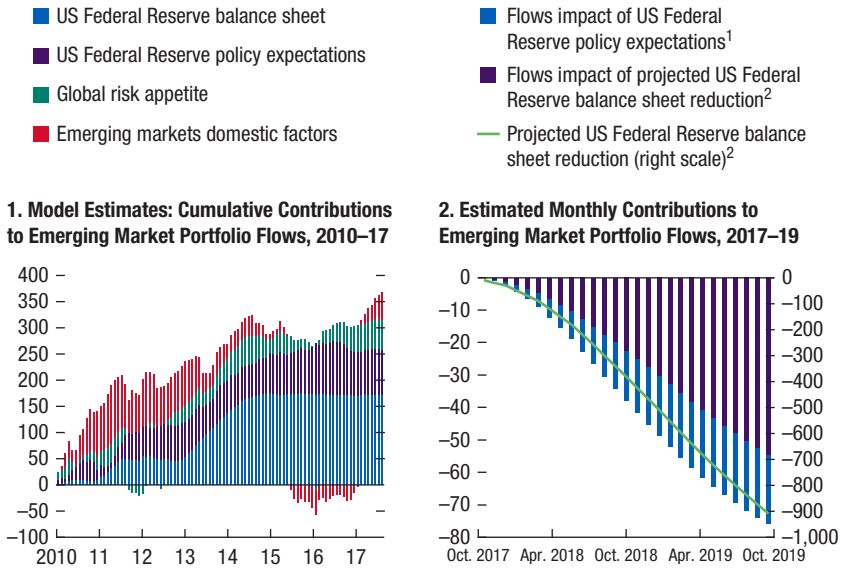
(Figure 2.10, panel 2, left vertical axis).⁷ Most emerging market economies should be able to handle this reduction in inflows, given their enhanced resilience and stronger growth outlooks.

A rapid increase in investor risk aversion would, however, have a more severe impact on portfolio inflows and could prove more challenging, including for China—but especially so for countries with greater dependence on external financing.

The relative foreign exchange value of the US dollar is another important driver of global financial conditions. China has moved to managing its exchange rate against a basket of currencies, rather than against the US dollar alone, to dampen exposure to US dollar variability. Nonetheless, the US dollar exchange rate tends to have a substantial impact on capital inflows (see Bruno and Shin

⁷ As IMF (2017a) highlights, estimates for portfolio flows are obtained using a model adapted from Koepke (2014). The model estimates the impact of external “push” and domestic “pull” variables on portfolio flows to emerging markets, consistent with the capital flows literature. The dependent variable reflects monthly data from the Institute of International Finance on nonresident portfolio flows to emerging market economies (that is, foreign purchases of emerging market stocks and bonds). Independent variables aim to capture push factors and pull factors. Push variables include a proxy for global risk aversion (either the US corporate BBB spread over Treasuries or the USVIX), three-year-ahead expectations for the effective federal funds rate, and the change in assets held on the Federal Reserve’s balance sheet. Pull variables include an emerging market economic surprise index compiled by Citigroup and the Morgan Stanley Capital International Emerging Markets Index (MSCI).

Figure 2.10. US Federal Reserve's Balance Sheet and Capital Portfolio Flows to Emerging Markets, 2010–17 and 2017–19
(Billions of US dollars)



Sources: *Global Financial Stability Report*, October 2017 and April 2018.

¹ *World Economic Outlook* forecasts for the path of the federal funds rate.

² US Federal Reserve's published plans for balance sheet normalization.

2015; Hofmann, Shim, and Shin 2017), and the US dollar's steady depreciation against most currencies from early 2017 to early 2018 (Figure 2.11, panel 1) has been one key driver of increasing capital inflows to emerging markets.

This depreciation spell, which stopped only in early 2018, stood at odds with the traditional (uncovered) interest rate parity condition.⁸ Take the US dollar–euro relationship, for example. As indicated by the market's expectations of future short-term interest rates (proxied by the yield differential of

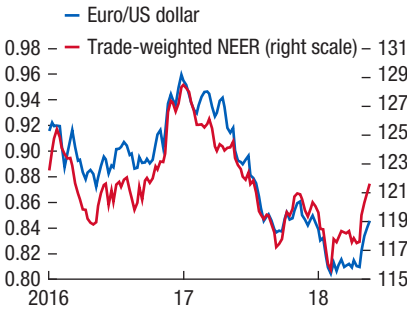
⁸ The traditional (risk-neutral) uncovered interest rate parity formula can be written as follows:

$$e_t = -\sum_{j=1}^T (i_{j,t} - i_{j,t}^*) + \sum_{i=1}^T (\pi_{t+i} - \pi_{t+i}^*) + \bar{q}_{t,T+1} + (p_t - p_t^*),$$

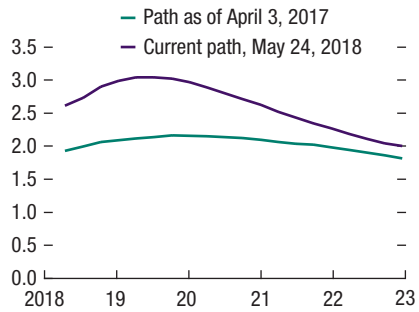
in which an asterisk denotes a foreign variable; e is the current nominal exchange rate (expressed in units of domestic currency per foreign currency, so that an increase in e represents a depreciation of domestic currency); i denotes a one-period nominal interest rate; π is an inflation rate; and q is the real exchange rate. As the future interest rate differential (the first term on the right) widens and future inflation-rate differentials (the second term on the right) narrow, theory predicts that the domestic currency should appreciate. The only potential counteracting force in the equation is the long-term future real exchange rate ($\bar{q}_{t,T+1}$), which captures a broad range of factors, including future fiscal policy conditions. Of course, adding risk premiums to the aforementioned formula (to capture the failure of uncovered interest parity) would introduce an additional driver of the currency's relative value.

Figure 2.11. Recent and Estimated Evolution of the US Dollar, 2016–18

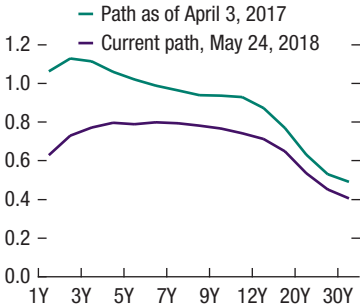
1. US Spot Exchange Rate and NEER
(Euros; NEER index 1997 = 100)



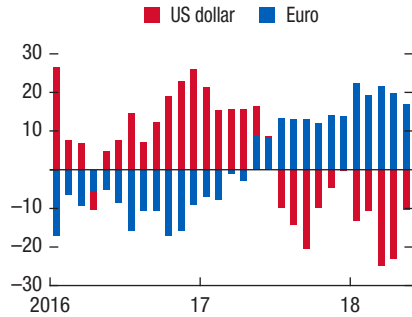
2. Implied Future Interest Rate Differentials, United States Minus Euro Area¹
(Percentage points)



3. Implied Future Inflation Rate Differentials, United States Minus Euro Area²
(Percentage points)



4. Speculative Euro and US Dollar Net Futures Positions
(Billions of US dollars; positive = net long position)



Sources: Bloomberg L.P.; Haver Analytics; US Commodity Futures Trading Commission; and Authors' calculations.

Note: NEER = nominal effective exchange rate.

¹ Eurodollar minus Euribor futures yield spreads. Each point represents the future-implied expected short-term interest rate differential at a specific date.

² Swap-implied future inflation rate differentials.

Eurodollar-Euribor futures in panel 2 of Figure 2.11), the market by the start of 2018 had priced in faster US monetary tightening than the implied future interest rate differential path at the start of 2017. Similarly, the market also expected the future inflation differential between the euro area and the United States to narrow further relative to expectations of early 2017 (Figure 2.11, panel 3). Both forces should have put upward pressure on the dollar, contrary to the evolution that actually occurred in the foreign exchange market.

The dollar's depreciating trend is reflected in foreign exchange futures market sentiment: speculative positions on the euro flipped from net short to net long after the euro began appreciating in early 2017, while the US dollar has been heavily shorted more recently. One possible explanation for the puzzling US dollar depreciation is that advanced-economy financial conditions have remained relatively loose, fueling capital outflows (and inflows to emerging market and frontier economies). Another potential explanation is that, given expected reductions in the Federal Reserve's balance sheet and impending bigger fiscal deficits in the United States, a great deal of US dollar debt will have to be absorbed by markets in the coming years, weakening the currency, all else being equal.

More recently (especially since April 2018), the dollar has indeed shown more strength, as growth in the euro area and Japan has seemed to retreat from stronger rates in 2017. Nonetheless, as of the end of May 2018, the US dollar had only partially reversed its cumulative depreciation after early 2017, and markets' speculative positioning on the currency remained net short—although at a lower level than at the end of 2017.

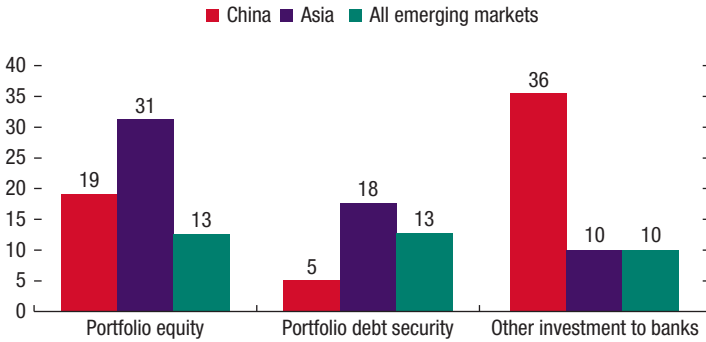
SENSITIVITY OF CAPITAL INFLOWS TO THE GLOBAL FINANCIAL CYCLE

The US variables discussed in the previous section are often identified as key drivers of the global financial cycle (Cerutti, Claessens, and Rose 2017). The increased integration of China into international capital markets will likely increase its exposure to the global financial cycle, which, some have argued, could augment financial stability risks while weakening the scope for independent monetary policy (Rey 2016).

China's sensitivity to the global financial cycle is currently lower than that of other countries in terms of portfolio flows, especially portfolio debt securities. As Figure 2.12 shows, based on the analysis of Cerutti, Claessens, and Puy (forthcoming), in China, only 5 percent of total variance in portfolio debt inflows is accounted for by a common factor empirically related to the global financial cycle. This is much lower than for the average Asian emerging market economy (18 percent) and for the average of all emerging market economies (13 percent). The finding is in line with the reality that foreign participation is simply not as large in China's bond market as it is elsewhere.

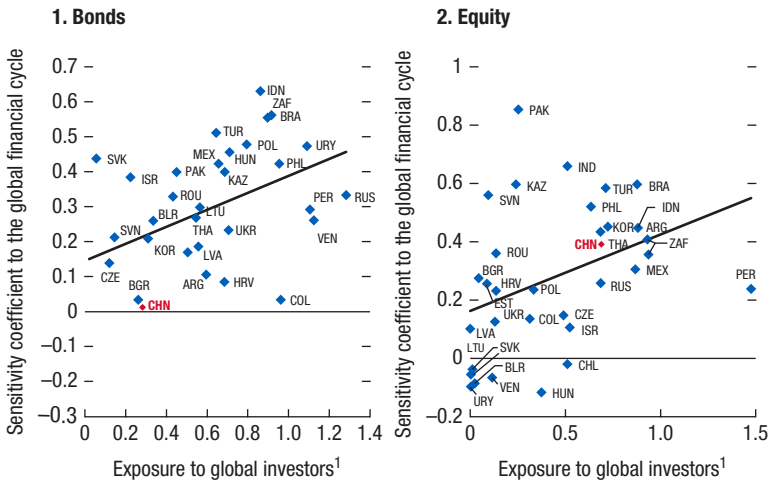
In this context, it is likely that further liberalization in the bond market would probably elevate sensitivity to the global financial cycle. Using the estimated loading coefficient for the common factor estimated by Cerutti, Claessens, and Puy (forthcoming), along with countries' exposures to global investors, one can visualize in Figure 2.13 (panel 1) how China's low bond inflow sensitivity is related empirically to the relatively low participation of global investors. Based on this cross-country evidence, it is foreseen that further liberalization of the Chinese bond market will increase sensitivity to global developments, as has happened in other countries. This is less the case for equity inflows, where China ranks in the middle of the emerging market economy group (see Figure 2.13, panel 2).

Figure 2.12. Sensitivity to Emerging Market Common Factors, by Type of Capital Flow, 2001–15
(Percent of total variance accounted for by the common global factor)



Source: Cerutti, Claessens, and Puy (forthcoming).

Figure 2.13. Exposure of Global Investors and Sensitivity to the Global Financial Cycle, 2001–15



Source: Cerutti, Claessens, and Puy (forthcoming).

Note: Data labels in the figure use International Organization for Standardization country codes.

¹ A weight above (below) one implies that the country was over- (under-) represented in global investor flows relative to total balance of payment flows. Peru is an outlier in terms of exposure to global investors in equity markets because of the incorporation in offshore markets of Peru's largest domestic bank holding company and a large Peruvian mining company.

CONCLUSIONS

Room remains substantial for further integration of China into the global bond market, which would advance the broader project of sustainably integrating the country into international trade and finance. However, this process will likely increase exposure to the global financial cycle.

This chapter concludes that, for monetary autonomy, the cost would not be large given China's size and especially under a more flexible exchange rate framework than the current one, supported by a well-articulated inflation-targeting framework.⁹ For financial stability, however, work remains to be done, as both China's government and the IMF recognize (IMF 2017b).

Other advantages, from a domestic Chinese perspective, include that an influx of foreign capital would help diversify funding and improve liquidity, maturities, and transparency in the local bond markets. Similarly, further geographical diversification by Chinese resident financial asset holders (including in the private sector) would improve domestic asset allocations.

From a global perspective and taking into account that China offers a potentially large pool of savings, better integration into the international bond market could promote a significantly more productive allocation of the world's savings, to the benefit of lenders and borrowers alike.

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⁹ The need for greater flexibility is often cited inside and outside of China, but much progress remains to be made. Transition could proceed along broad lines as laid out in Obstfeld (2007), with due attention to the need to refine an appropriate inflation-targeting framework, as discussed in several of the essays in AI and Schipke (2017).

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PART II

Bond Market Characteristics

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Sovereign Bonds: What Does the Yield Curve Tell Us?

**CHEN Sally, ZHANG Longmei, and Kevin Chow,
with Thomas Harjes and Nathan Porter**

China's sovereign bond market has ballooned in recent years into the world's third largest after the United States and Japan. But concerns about limited liquidity, investor participation, and market efficiency have consistently marred investor perceptions of the country's government bonds as a suitable benchmark for the overall bond market.

Low liquidity in the medium and long end of the yield curve, as well as thin overall secondary market activity beyond the 10-year maturity, limit the reference function of government bonds for other instruments. And banks still hold roughly 70 percent of all government Treasuries outstanding—usually holding them until maturity—limiting the supply of recently issued on-the-run securities for secondary trading and “information processing” in the bond market.

These factors have caused many to doubt whether the government yield curve can accurately reflect market conditions and thus help develop the bond market and, more broadly, China's capital markets—an important task in the country's economic reform efforts.

Nonetheless, this chapter finds that various measures implemented in recent years have boosted the linkage between China government bond (CGB) curve factors, macro variables, and global financial market conditions. And despite liquidity concerns, the government bond yield curve seems to anticipate changes in macroeconomic conditions. Similarly, there is evidence that linkage between liquidity management by the People's Bank of China (PBC) and CGB pricing is emerging, suggesting growing policy transmission via the bond market.

This chapter analyzes China's government bond market—yield movements, changes in its slope and curvature, and responses and interactions with the aggregate economy—to better understand its liquidity and informational efficiency. It finds that with greater market liberalization, more market-based open market operations from the PBC, integration with the global financial system, and a more robust CGB market,¹ the Chinese central government bond market can become a more efficient tool in the country's crucial economic transition.

¹ Box 3.1 details the evolution of China's monetary policy operations and their macroeconomic impact.

CHARACTERISTICS OF A LIQUID, ROBUST BOND MARKET

An efficient and well-functioning government bond market underpins operations in the entire financial market of a country. Generally, the “risk-free” status of government bonds and their relatively higher liquidity can benchmark other fixed income securities in the same currency, facilitate hedging positions held in other markets, and foster efficient resource allocation.²

Moreover, because governments are considered the most creditworthy borrowers in an economy, government bond yields are by extension seen as proxies for nominal risk-free rates. Yield spreads of other debt—including local government and private corporate debt relative to the levels at which governments borrow—otherwise known as “risk spreads,” are often used to gauge the market’s assessment of the creditworthiness of other borrowers. Capital market participants also rely on the government yield curve to assess the cost of funds on different time horizons. For this, the bond market can be a useful long-term asset and risk management tool.

The latter is important for China as it further liberalizes its economy. A developed capital market would unburden a banking system that has thus far provided the bulk of financing to borrowers. A deep capital market would also expand the government’s ability to fund large infrastructure projects and urbanization programs, as well as meet greater social spending needs, such as for an aging population.

A well-developed government securities market can also boost the rest of the bond market by enhancing overall bond market liquidity. Government securities generally offer a range of maturities and are widely traded, facilitating construction of a risk-free yield curve. The most recently issued bonds—so-called on-the-run securities—are often more liquid than other, older bonds. In addition, deep, liquid repurchase (repo) and derivatives markets allow investors to take speculative positions on sovereign debt and thus reveal expectations on future interest rate movements—including growth and inflation outlooks, as well as government funding needs—enhancing bond market liquidity.

A liquid bond market, in turn, can provide useful information about macroeconomic developments. And the changing slope of the government yield curve and interest rate movements can help gauge investor expectations of macroeconomic fundamentals. A rich literature also shows that, empirically, the slope of the yield curve offers useful insights into investor expectations for growth and inflation prospects. For example, an inverted yield curve—where shorter rates are higher than longer rates—tends to be associated with greater likelihood of recession (or default); and a steeper nominal yield curve suggests expectations of faster growth and, possibly, rising inflation.

The efficiency of the bond market is also a critical part of indirect monetary policy transmission and implementation. Even in a bank-dominated financial

² This risk-free status is relative to other bonds for the same country, such as corporate bonds, which carry additional credit risk.

system, the government bond market is important for transmitting the cost of banking system reserves—as influenced by policy decisions about interest rates and banking system reserves—and of the cost of commercially borrowed funds (given the dominant role of banks in the government bond market). These prices should then transmit directly to bond yields for subnational governments and corporations, subject to movement in their specific credit risk spreads. In turn, these changes influence banks' decisions over lending, loan rates, and more broadly, other interest rates in the economy.

But the usefulness of a government yield curve is not determined by fiat; it depends critically on the efficiency with which bond prices adjust to new information. This process, including the movement of rates toward their equilibrium values, relies on market participants' willingness to use government securities as reference rates, including their ability to act on their views and the usefulness of these sovereign bonds as hedging instruments. A liquid government bond market therefore is crucial to efficient capital allocation and information gathering, as much of the analysis and pricing activity in the bond markets revolve around the government yield curve.

Cassola and Porter (2011) have already found that China's bond yields (sovereign and corporate) do contain considerable information about the state of the economy and seem to play a role in an emerging monetary policy transmission channel, although they are not fully efficient, given regulation, liquidity, and segmentation issues. Since then, much has happened: China's financial market has deepened and is further integrating gradually with the global financial system.

Yet, questions of efficiency and concern for lack of liquidity in China's bond market remain. Although, as noted, the central government bond market has expanded to become one of the largest globally, liquidity remains an issue amid limited investor participation. A propensity for the largest investors to hold to maturity and limited market liquidity beyond the 10-year sector have led many to doubt whether the yield curve can accurately reflect market conditions.

Meanwhile, despite formal interest rate liberalization, competition among banks in deposit taking and lending remains somewhat constrained. Beyond the central government bond market, well-connected state-owned enterprises still borrow at favorable rates (see Chapter 4 on credit bonds), and local governments and many large, private corporations issue debt with limited risk spreads relative to central government bonds due to perceptions of implicit guarantees and backstops by governments. Still, the Chinese government bond market is worthy of study. Its absolute size and growing linkage with the macroeconomy and gradually with the global financial system suggest that its developments are likely to have greater spillover and spillback between the domestic economy and the rest of the world (see Chapter 2 on China's bond and global financial markets).

This chapter addresses the following questions: Are Chinese government bond yields informative about macroeconomic developments? What are the macrofinancial interactions between real variables and bond yields? Have recent market developments and structural reforms strengthened transmission channels?

Have financial prices become more informative signals of business cycle dynamics to play a bigger role in allocating credit?

The chapter finds that since the 2008–09 global financial crisis, both domestic monetary policy and global financial conditions have had an increasing impact on the level, slope, and curvature of the yield curve, likely boosted by China's growing nonbank and shadow banking sectors as the government launched large stimulus programs to support growth following the global financial crisis. In addition, the yield curve provides predictive power for real activities proxied by industrial production. Meanwhile, the monetary policy stance, proxied by the 7-day repo rate and the benchmark lending rate, has a significant and persistent impact on short-dated central government bonds, suggesting growing linkage between monetary policy and bond market pricing. Lastly, the transmission to inflation is limited, likely reflecting China's flattening Philips curve.³

OVERVIEW OF CHINA'S GOVERNMENT BOND MARKET

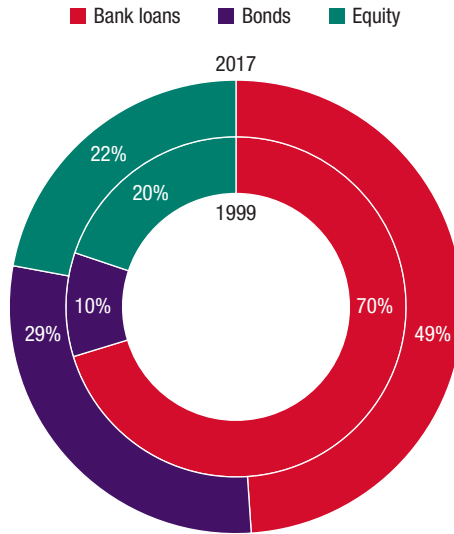
China's bond market has expanded sizably, from 17 percent of GDP in 2000 to 90 percent in 2017. Bonds in 2017 made up about one-third of total financing, from less than 10 percent in 1999 (Figure 3.1). Meanwhile, the importance of bank lending has been declining, with its share in total financing falling from 70 percent in 1999 to less than 50 percent in 2017.

This expansion in bond financing has been largely driven by relaxed policy on bond issuance and growing financing needs. For example, simplification of the approval procedure has boosted corporate bond issuance in the onshore market. In the public sector, gross issuance of local government bonds has increased markedly since the implementation of the debt-for-bond swap program, while bond issuance by the Ministry of Finance and policy banks (notably, the China Development Bank, the Export-Import Bank of China, and the Agricultural Development Bank of China) has continued to increase to support government finance and infrastructure investment (Figure 3.2).

As the size of the bond market has grown, the share of bonds from government entities has fallen relative to the total outstanding. Bonds and fixed income securities issued by central and local governments, policy banks, and the central bank fell from 78 percent in 2010 to 56 percent in 2017 (Figure 3.3). The decline is largely due to a suspension of central bank bill issuance as the PBC changed its tools for managing liquidity in the banking sector. Meanwhile, the share of private sector bonds increased to 45 percent of the total outstanding, thanks to active issuance of corporate bonds, bank negotiable certificates of deposit, and other

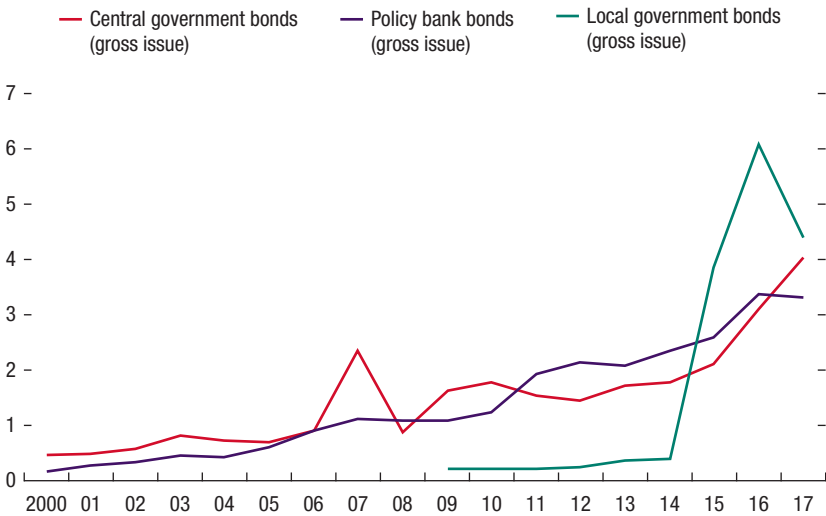
³ A flat yield curve, in which longer-dated yields are roughly the same as short rates, tends to suggest impending recession. In China's case, the interpretation is complicated by both a flattening Philips curve and limited liquidity at the longer end of the yield curve. In particular, the latter curtailed the predictive power of the central government bond curve, as discussed later in the chapter.

Figure 3.1. China's Financial Structure, 1999 and 2017



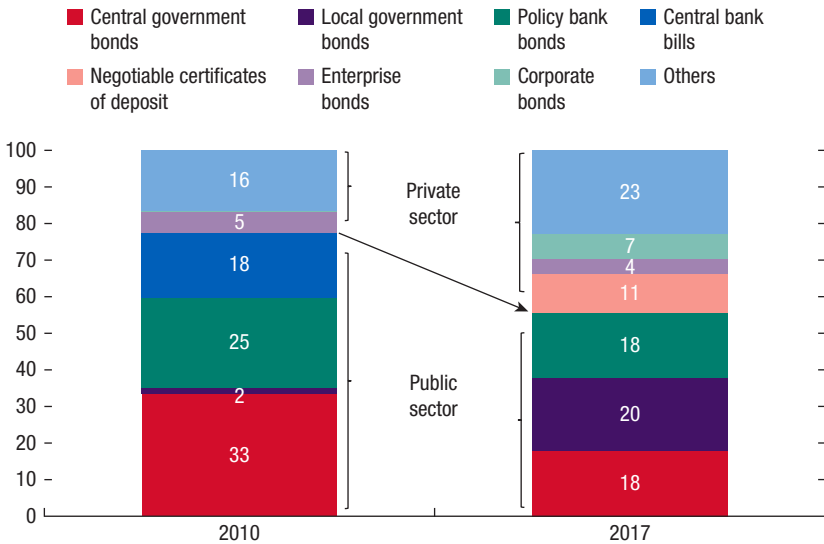
Sources: People's Bank of China; and authors' calculations.

Figure 3.2. Public Sector Bond Issuance, 2000–17
(Trillions of renminbi)



Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Figure 3.3. Outstanding Bonds by Issuer, 2010 and 2017
(Percent)



Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

types of fixed income securities such as convertible bonds and asset-backed securities.

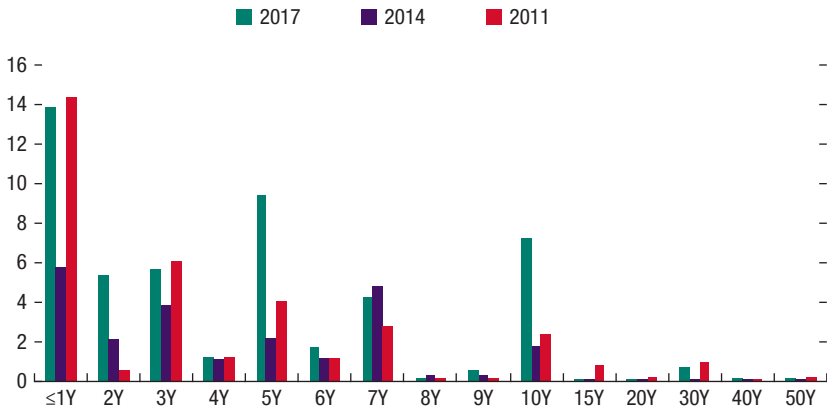
Currently, the liquidity of CGBs remains limited and unevenly distributed. In the more mature markets, such as the United States, most transactions—and by extension, private sector bond pricing references—take place in the intermediate-dated sector of the yield curve, such as 5- and 10-year bonds. By comparison, most transactions in CGBs are concentrated in the short end of the yield curve (Figure 3.4). For example, more than half of turnover is located in the 3-year or shorter segment. For longer-dated CGBs, liquidity is concentrated at the 4- and 5-year as well as the 9- and 10-year segments of the yield curve. Relatively thin liquidity in longer-dated bonds suggests that the slope of the yield curve could be largely driven by movements in short-dated instruments and the information content of longer-dated bonds could be limited.⁴

Liquidity in the market for policy bank bonds, which are also considered risk free, is deeper by comparison; this deeper pool of trading liquidity has offered greater information efficiency in policy bank bonds.⁵ Specifically, liquidity here has been boosted by more frequent reopenings of on-the-run papers, helping to enhance the benchmark status of these securities and boosting trading activity.

⁴ For more in-depth discussions on liquidity conditions across different yield curve segments, please refer to Chapter 12 on Trading in China's Bond Market.

⁵ For more in-depth discussion on policy bank bonds, please refer to Box 3.2.

Figure 3.4. Central Government Bond Daily Turnover, by Maturity, 2011, 2014, and 2017
(Billions of renminbi)



Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Note: Y = year.

Based on evidence from the policy bank bond market, analysis by International Monetary Fund (IMF) staff suggests that improving trading liquidity is key to enhancing the CGB market's information efficiency and its policy transmission mechanism.

CONSTRUCTING AND DISSECTING THE DIFFERENT YIELD CURVE COMPONENTS

There is a large amount of literature about the power of the slope (and by extension the curvature) to predict economic activity and inflation. The transmission mechanism largely involves monetary policy and inflation expectations (Afonso and Martins 2010). Bond yields tend to rise in response to stronger growth and higher inflation. Meanwhile, a flat or humped yield curve is generally associated with an uncertain economic outlook. Specifically, an inverted yield curve has historically been associated with recessions (Bauer and Mertens 2018).

To better understand the structure of China's government yield curve and, in turn, its interaction with macroeconomic developments, this section decomposes the central government yield curve into three factors: level, slope, and curvature. The identification of these factors helps assess the linkage between yield curve and macroeconomic developments.

The identification exercise relies on the three-factor Nelson-Siegel model (Diebold and LI 2006).⁶ This class of factor model is one of the most popular used by academics and market participants. It is capable of replicating a variety of stylized facts from empirical yield curves. Specifically, the loading parameter λ can be varied over time; this variable, which determines the relative factor loadings, has been found to increase dramatically, becoming volatile ahead of recessions and declining afterward in both its level and volatility (JIAO and MA 2017). The factor loadings for level, slope, and curvature—each set to capture movements in these three factors—also afford users flexibility in reproducing a range of yield curve shapes, including changes in overall yield levels, as well as movements in long and short rates that determine the slope and curvature of the yield curve.

Data and Methodology

Data on the government yield curve are from the WIND database for both inter-bank and exchange traded bonds;⁷ these are monthly observations from 2002. Using the Nelson-Siegel model, the CGB yield curve is approximated by the following three factors:

$$\bar{y}_{i,T} = \beta_{1t} + \beta_{2t} \left(\frac{1 - e^{-\lambda_i \tau}}{\lambda_i \tau} \right) + \beta_{3t} \left(\frac{1 - e^{-\lambda_i \tau}}{\lambda_i \tau} - e^{-\lambda_i \tau} \right). \quad (3.1)$$

The parameters of the defined yield curve are β_{1t} (level), β_{2t} (slope), and β_{3t} (curvature). Their respective loadings are given as 1, $\left(\frac{1 - e^{-\lambda_i \tau}}{\lambda_i \tau} \right)$, and $\left(\frac{1 - e^{-\lambda_i \tau}}{\lambda_i \tau} - e^{-\lambda_i \tau} \right)$.

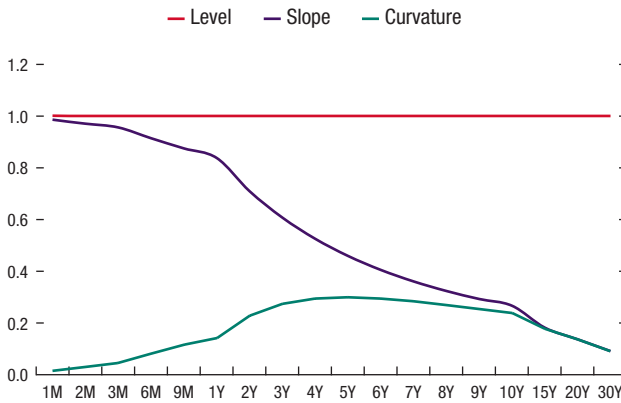
- The first factor, with a loading of one, represents the long-term *level* of interest rates as an increase in β_{1t} increases all yields equally, changing the *level* of the yield curve (Figure 3.5).
- Loading for the second factor, as it declines from 1 to 0, reflects a short-term factor and is interpreted as negative of the “slope”: an increase in β_{2t} raises short yields more than long yields, thus changing the *slope* of the yield curve. Here, a negative slope factor indicates a steep curve (that is, short rates are lower than long rates).
- Loading for the third factor, starting at 0, increases before converging back to 0 at long maturities, represents a medium-term factor, and is interpreted as *curvature*. Since increases in β_{3t} have minimal effects on long and short rates, an increase in β_{3t} will increase the curvature of the yield curve.⁸

⁶ This exercise relies on an IMF term structure estimation tool; for more information, please see Gasha and others (2010).

⁷ WIND Economic Database (www.wind.com.cn).

⁸ The parameter λ_i controls both the exponential decay rate and the maturity at which the loading on β_{3t} reaches its maximum.

Figure 3.5. Estimated Factor Loadings, by Tenor
(Coefficient)



Source: Authors' calculations.

Note: M = month; Y = year.

Results

Using estimation results, the implied fitted curve and the actual yield curve are close, indicating overall good fit provided by the model (Annex Figure 3.1.1). A robustness test using the most-liquid tenors—bills out to the 10-year note—offers qualitatively similar results (Annex Figure 3.1.2).

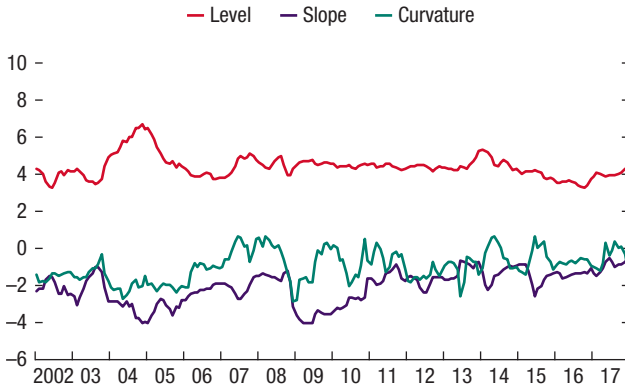
The time series of the three latent yield-curve factors—level, slope, and curvature—offer the following insights on China's central government bond yield curve (Figure 3.6):

Level: There is some variability in the level of the yield curve over time. Higher rates—particularly at longer tenors—were seen earlier in the sample (around 2003), while, more recently, rates were lower by comparison (Annex Figure 3.1.3). That said, overall, yield levels were mostly stable since the global financial crisis, with a few cyclical swings seen since 2013.

Slope: The slope factor shows the typical pattern of a steep yield curve (that is, negative value), though it does occasionally flatten (approaching zero), including periods before the global financial crisis as well as over brief periods in more recent years. Notably, the dramatic flattening of the slope around the global financial crisis and its subsequent steepening are developments in line with other bond markets.

Slope changes matter, as they offer greater insight into yield movements. The short end of the curve exhibits greater variability relative to the longer end (Annex Table 3.1.1), likely reflecting reduced liquidity for longer-dated CGBs and the segment's limited responses to changes in macro data, financial conditions, and policy.

Figure 3.6. Estimated Factors for the Central Government Bond Yield Curve, 2002–17
(Percent)



Source: Authors' calculations.

Curvature: Findings here offer insight into yield movements across the three segments of the yield curve—the short end, proxied by the 1-month bill; the mid section, proxied by the 10-year note; and the long end, proxied by the 30-year note. The curvature factor is often negative, suggesting that the curve is usually upward sloping (that is, the yield on short-dated paper is lower relative to the middle of the curve, which is lower compared to the longer-dated paper; Annex Tables 3.1.2 and 3.1.4). Not surprisingly, it is also positively correlated with slope, given a steep yield curve observed generally.

Still, the curvature factor exhibits slightly different variability compared to the slope, suggesting that the different segments of the yield curve react differently to the same information (Annex Tables 3.1.2 and 3.1.4); again, this is not a surprise. Inflation and growth shocks, as documented by the literature, tend to have varying impacts on different segments of the yield curve. A negative growth shock tends to lower longer-dated yields more than short rates, while positive inflation shocks tend to lift short rates more than long rates, likely in anticipation of tighter monetary policy in the immediate future. Apart from this, limited trading liquidity in the intermediate-dated and longer-dated securities may have played a role in the CGB's yield curvature. Indeed, longer-dated securities have narrower standard deviations than shorter-dated paper; this suggests that the information content in the longer-dated securities may be limited (Annex Table 3.1.1). Robustness tests using the most liquid tenors offer qualitatively similar results (Annex Figure 3.1.4).

MACROFINANCIAL LINKAGE

To assess the interaction between the CGB yield curve and the macro economy, this section first looks at simple correlations between the estimated factors and macro variables as a starting point. It then uses vector autoregression to analyze the impact of shocks to monetary policy, economic activity, and global financial conditions on the yield curve. Finally, it estimates the extent to which shocks to the yield curve could be transmitted to the real economy.

Simple Correlations

Simple correlation suggests that the yield curve factors are correlated with monetary policy, macro indicators, and global financial conditions, though the degree of correlation varies (Table 3.1). Notably, the 7-day repo rate and the 10-year Treasury yield are both highly correlated with the slope factor. A closer look at these variables offers the following insights:

The level factor was correlated with movements in industrial production growth—a proxy for GDP growth. As China's growth slowed after the boom years in the early 2000s, yield levels fell generally, though there were cyclical swings. Since late 2016, amid an economic upswing and recovery in industrial production—prompted in part by a rebound in producer price inflation—yields have increased (Figure 3.7).

The high negative correlation between the repo rate and the slope suggests that short rates play an important role in the slope of the yield curve. This is not surprising. Repo rates—and policy rates by extension—affect the level of short rates more disproportionately. And, to the extent that inflation affects the level of short rates—compared to the impact of growth on longer-dated yields, for example—an increase in the consumer price index (CPI) is generally associated with a flattening of the slope (that is, the slope factor turns less negative); this correlation is in line with observations in other countries. During periods of high inflation, policy rates rise, lifting short rates and flattening the yield curve correspondingly. During the global financial crisis, weakened economic activity, falling inflation,

TABLE 3.1.

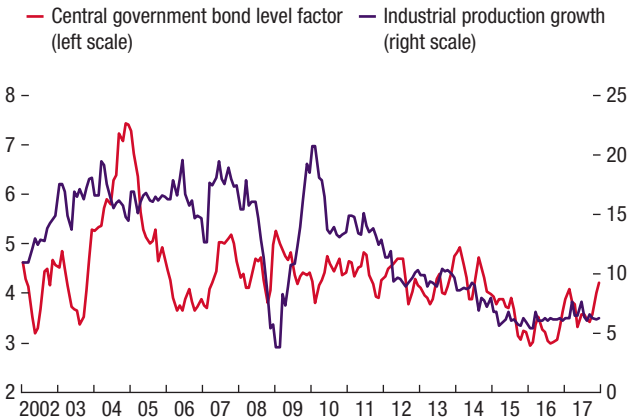
Correlation Matrix of Central Government Bond Yield Curve Factors and Macro and Financial Variables

	1	2	3	4	5	6	7	8
1. Level factor	–							
2. Slope factor	0.72							
3. Curvature factor	–0.57	–0.56						
4. Industrial production growth	0.45	0.50	–0.22					
5. Consumer price index	0.26	–0.18	0.17	0.30				
6. 7-day repurchase rate	–0.15	–0.67	0.28	–0.28	0.44			
7. 10-year Treasury yield	0.38	0.50	–0.31	0.76	0.01	–0.43		
8. VIX	0.03	0.23	–0.13	–0.01	–0.05	–0.16	0.03	–

Sources: Bloomberg LP; CEIC; and authors' estimates.

Note: VIX = Chicago Board Options Exchange Volatility Index.

Figure 3.7. Central Government Bond Level Factor and Industrial Production Growth, 2002–17
(Percent, left scale; year-over-year percent, right scale)



Sources: CEIC; and authors' calculations.

and the corresponding decline in policy rates weighed on short rates and steepened the yield curve (that is, the slope factor became more negative). In more recent periods, while inflation has remained contained, the CGB slope has flattened as regulatory tightening has pushed up short rates (Figure 3.8).

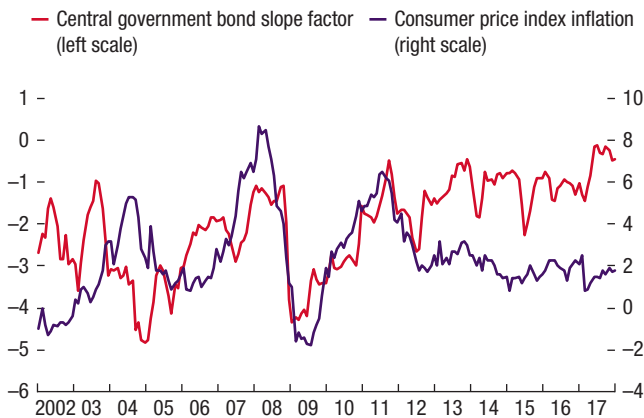
Linkages between Yield Curve Factors and Macroeconomic Variables

To assess the interaction between domestic macro conditions, global financial conditions, and the central government yield curve, this analysis estimated a set of vector autoregressions. Domestic macro variables include industrial production growth—a proxy for GDP growth—and CPI and producer price index (PPI) inflation. The monetary policy stance in China is proxied by the 7-day repo and benchmark lending rates. Global financial conditions are proxied by the 10-year US Treasury yield and the Chicago Board Options Exchange Volatility Index (VIX). The full data sample runs from January 2002 to December 2017 and is separated into two subsamples (2002:M1–2007:M12 and 2008:M1–2017:M12) to better distill responses in the periods before and after the global financial crisis. For ease of interpretation, the sign of the slope factor was inverted—a positive sign signals a steepening of the yield curve (that is, long rates increase more than short rates), while a negative sign indicates a flattening of the curve.

A large body of literature offers explanation for the possible channels of transmission between macro variables and the yield curve. For example, Diebold, Rudebusch, and Aruoba (2006) note that, in the United States, Treasury yields react to macroeconomic developments by anticipating the Federal Reserve's

Figure 3.8. Central Government Bond Slope Factor and Consumer Price Index Inflation, 2002–17

(Percent, left scale; year-over-year percent, right scale)



Sources: CEIC; and authors' calculations.

decision, or the Fed could be setting its federal funds target by reacting to yield developments. In China, it is possible that the greater use of open market operations in recent years has increased the economy's sensitivity to short rates—as evidenced by industrial production's response to increases in short rates and a steepening of the slope—and by extension, changes in the slope of the government yield curve.

Several questions were considered and revealed complex dynamics between macroeconomic variables and yield curve factors:

- Macroeconomic variables' response to yield curve shocks, including industrial production, inflation, and the 7-day repo and benchmark lending rates
- Yield curve responses to macroeconomic shocks
- Yield curve responses to changes in monetary and liquidity conditions
- Yield curve responses to shocks to the 10-year Treasury yield in the United States as well as the VIX to gauge the impact of greater market integration with the rest of the world.

Responses of the Macroeconomic Variables to Yield Curve Shocks

In general, macro variables' sensitivity to yield curve shocks increased in the period after the global financial crisis, suggesting a growing relationship between the yield curve and economic developments since then. The most notable impacts are seen in responses to changes in the level factor:

- *Level*: Increases in the level factor were associated with notable and persistent declines in CPI both before and after the global financial crisis. In the pre-global financial crisis period, a positive shock to the level factor leads to lower CPI inflation four months later; by comparison, the decline in CPI was immediately after the global financial crisis (Annex Figure 3.1.5). The significant role of the level factor is underscored by the variance of the errors in forecasting CPI. At the eight-month horizon, surprises to the level factor explain roughly 12 percent of such variance and stabilize at around that level thereafter in the period after the global financial crisis (Annex Table 3.1.5).
- *Slope*: The slope factor offered limited predictive power for CPI in periods both before and after the global financial crisis. It does offer tentative evidence that increases in the slope of the yield curve lowered CPI roughly half a year later. Meanwhile, a steeper curve leads to an increase in industrial production growth three months later in the post-global financial crisis period, with persistent impacts.

Response of Yield Curve Factors to Macroeconomic Shocks

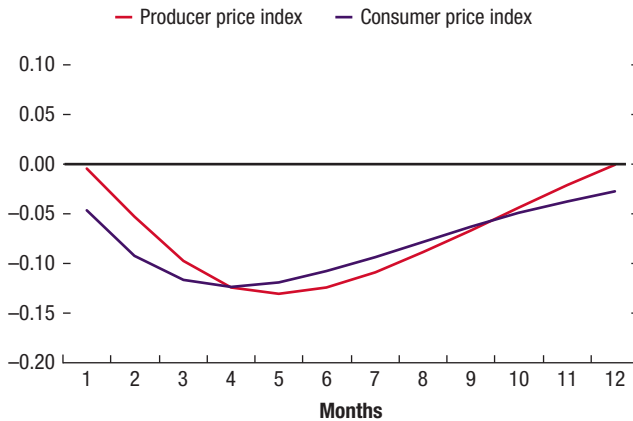
Yield curve factors did not seem to respond to macro shocks before the global financial crisis, but became more responsive to both industrial production and inflation shocks after the global financial crisis. Specifically, an increase in CPI leads to an immediate flattening of the yield curve after the global financial crisis, with the impact persistent through the one-year horizon (Figure 3.9). For PPI—to reflect the possibility that PPI may be more representative of inflationary pressure during the years of export-oriented, manufacturing-heavy production—the impact is similar on the slope factor, while somewhat larger on the curvature factor compared to CPI (Figure 3.10). Meanwhile, a positive shock to industrial production lifts the level factor with a four-month lag (Annex Figure 3.1.6).

The findings on the slope and curvature added nuance to insights into the movements of the yield curve. The flattening of the yield curve in response to inflation increases after the global financial crisis (both PPI and CPI) was driven more by the intermediate sector, as evidenced by the steepening of the curvature, followed by short rates, evidenced by a flattening of the curve. That said, movements in the middle of the curve were relatively short lived, with the impact fading within four to six months, while a flattening of the curve was persistent out to a year.

Response of Yield Curve Factors to Monetary Policy Stance

Seven-day repo rate: The impact of the repo rate—a proxy for the monetary policy stance—on yield curve factors is immediate, significant, and more durable in the period after the global financial crisis, suggesting an increase in the linkage between the repo rate and the government yield curve. Specifically, increases in the repo rate raise yield curve levels almost immediately, though this effect fades

Figure 3.9. Response of Central Government Bond Slope Factor to Inflation Shock, after the Global Financial Crisis
(Percentage points)



Source: Authors' calculations.

Note: The period after the global financial crisis refers to January 2008 to December 2017.

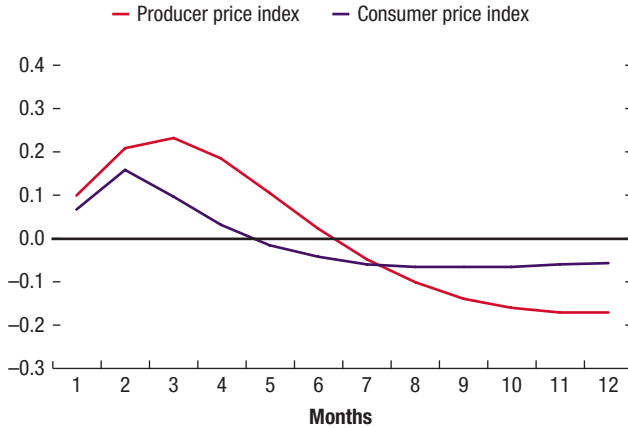
after four months. Meanwhile, increases in the repo rate have a significant and persistent impact on the slope of the curve, with the yield curve flattening in the following 12 months. These two findings suggest that shocks to the repo rate have a durable impact on short-term yields, underscoring the growing linkage between these two rates after the global financial crisis (Annex Figure 3.1.6).

Benchmark rate: The one-year benchmark lending and deposit rate was used as the policy rate by the central bank for many years before the gradual switch to the 7-day repo rate (Box 3.1). To better capture the dynamics during these years, the analysis looked at the transmission from benchmark rate to yield curve and compared it with that of the repo rate. Interestingly, the transmission is much stronger and persistent for the repo rate in the period after the global financial crisis, with the difference most evident in the slope factor. This suggests that the 7-day repo rate has become more effective in guiding market expectations (Figure 3.11).

Response of the Central Government Bond Yield Curve to Global Financial Conditions

China's growing financial market integration with the rest of the world suggests increasing spillover of global financial conditions into China. Using the 10-year US Treasury note as a proxy for benchmark funding conditions in the United States and the VIX as a proxy for global market volatility, findings from the period after the global financial crisis suggest that shocks to the 10-year Treasury yield

Figure 3.10. Response of Central Government Bond Curvature Factor to Inflation Shock, after the Global Financial Crisis
(Percentage points)



Source: Authors' calculations.

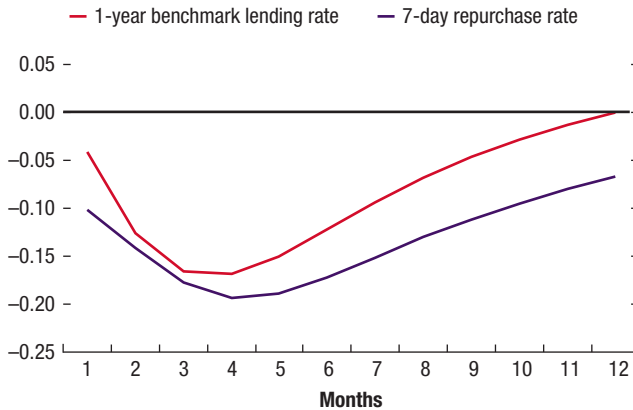
Note: The period after the global financial crisis refers to January 2008 to December 2017.

have a significant and persistent impact on CGB level and slope, while the impact of VIX fades within two to three quarters (Annex Figure 3.1.7).

- *Ten-year Treasury yield*: Before the global financial crisis, there is little linkage between the CGB curve and the 10-year US Treasury yield, given China's limited integration with international markets. After the global financial crisis, increases in the 10-year Treasury yield are associated with an immediate and persistent impact on CGB levels and a steepening of the slope, suggesting greater correlation with longer-dated CGB notes. Meanwhile, in response to increases in the 10-year Treasury yield, the CGB curve steepened. Notably, the US 10-year yield can explain about 7–9 percent of variation in the CGB level and slope factors after the global financial crisis (Annex Table 3.1.7).
- *VIX*: Similar to the 10-year Treasury yield, the VIX does not have a significant impact on China's yield curve in the earlier years. After the global financial crisis, shocks to the VIX raise overall yield levels and steepen the yield curve, though these impacts fade after 8 to 11 months. These findings suggest that although an increase in volatility raises the CGB term premium, its impact is relatively short lived. Still, the VIX explains about 40 percent of variation in the slope factor in recent years, suggesting a close link between China and global financial markets.

Figure 3.11. Response of Central Government Bond Slope Factor to Interest Rate Shock, after the Global Financial Crisis

(Percentage points)



Source: Authors' calculations.

Note: The period after the global financial crisis refers to January 2008 to December 2017.

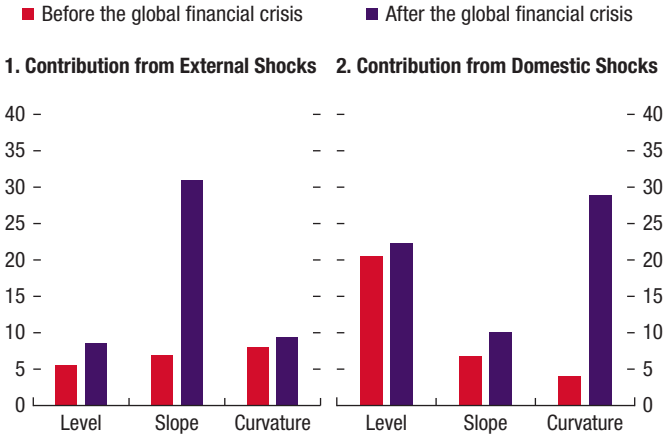
Domestic versus External Shocks: Comparison of US Treasuries and Policy Bank Bonds

Analysis of the linkages between the CGB yield curve and macro conditions—both domestic and external—uncovered the following:

- *Sensitivity to macro shocks increased following the global financial crisis:* All the curve factors evidenced greater response to macro shocks in the period after the global financial crisis. Notable increases in slope and curvature sensitivities suggest that the short and intermediate sectors of the curve are becoming more responsive to macro developments.
- *Domestic variables matter more in affecting yield curve movements:* Both the level and curvature factors are more responsive to domestic developments than to external shocks.
- *External factors are increasingly more influential in CGB movements:* External shocks (VIX and US Treasury yield) are increasingly driving the change in the slope factor, and are even more important than domestic factors (the sum of contributions from the 7-day repo rate, industrial production, and inflation) in the period after the global financial crisis (Figure 3.12). This likely reflects the magnitude of global financial shocks in this period, as indicated by sizable volatility in the VIX.

Nonetheless, the overall impact of yield curve movement on macro conditions remains limited compared with advanced economies. For example, the impulse

Figure 3.12. Contributions from External and Domestic Shocks to Variance of Forecast Error of Yield Curve Factors, before and after the Global Financial Crisis
(Percent, 12-month average)



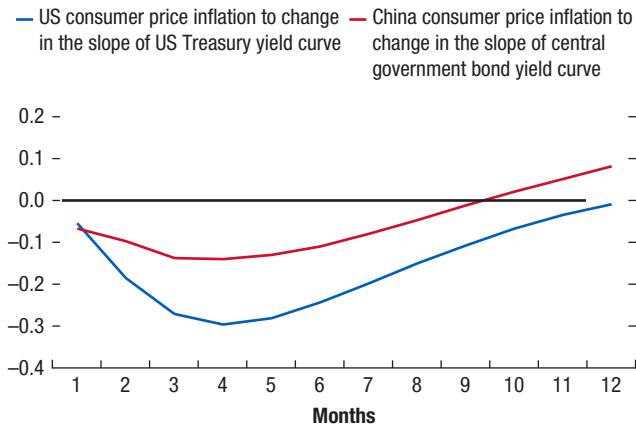
Source: Authors' calculations.

response of inflation to a change in the slope factor is three times larger in the United States than in China (Figure 3.13). This likely reflects that China remains a bank-credit-driven economy, and room is significant for expanding the role of the bond market. Moreover, still-limited market liquidity—including secondary market trading—has hindered the efficiency with which CGBs incorporate new data and policy changes.

Comparisons against policy bank bonds offer greater insight into the role of trading liquidity in the information content of the bonds. Policy bank bonds are close analogs to CGBs. Both securities are considered “risk free” and are backed by the central government. The key difference between these two stems from their trading liquidity. Benchmark policy bank bonds are reopened more frequently, allowing on-the-run securities to trade with greater liquidity (Box 3.2). This level of liquidity therefore allows policy bank bonds to become more responsive than CGBs to domestic and external developments.

Applying the same vector autoregression analysis for CGBs to these policy bonds, it is found that policy bank bonds have been more responsive than CGBs to domestic shocks during the period after the global financial crisis, particularly for the level factor; this suggests these bonds offer greater monetary policy transmission than CGBs (Figure 3.14). Specifically, policy bank bonds are more sensitive to changes in industrial production and inflation, likely reflecting their deeper liquidity and greater efficiency at reflecting data and policy developments.

Figure 3.13. Response of Inflation to Shock in Government Yield Curve Slope Factor, after the Global Financial Crisis
(Percentage points)



Source: Authors' calculations.

CONCLUSIONS

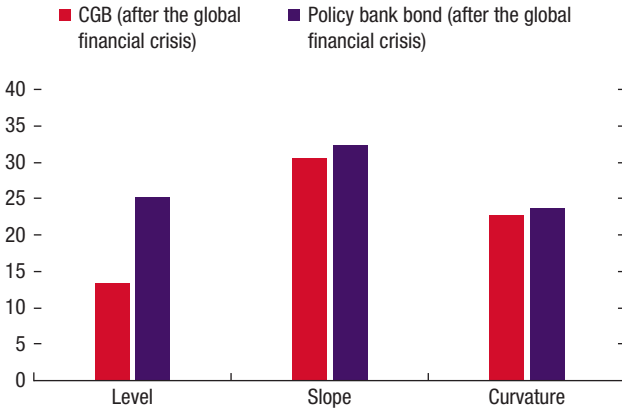
Over the years, the Chinese government has introduced reform measures to improve liquidity in the domestic bond market. The number of primary dealers and market makers that facilitate the trading of central government and policy bank bonds has increased. After the inclusion of the renminbi in the special drawing rights basket, the authorities further opened the domestic bond market to foreign investors.

The PBC also introduced changes to its monetary policy operations. For example, the introduction of new tools such as the standing lending facility and the medium-term lending facility have increased central bank flexibility in managing banking system liquidity. This has resulted in less frequent use of the reserve requirement ratio and benchmark interest rates, but both of these continue to carry strong market signals and can be too blunt for policy fine-tuning.

In part due to these developments, the linkage between CGB curve factors, macro variables, and global financial market conditions is growing. Notably, despite concerns regarding limited liquidity and opportunities for price discovery, CGBs seem to anticipate changes in macroeconomic conditions, with the correlation more pronounced and durable after the global financial crisis, though overall predictive power remains weak.

Meanwhile, changes in the 7-day repo rate have a significant and persistent impact on short-dated CGBs, suggesting a growing linkage between the PBC's liquidity management, which affects repo rates, and CGB pricing. Also notable is

Figure 3.14. Contributions from Domestic Shocks to Variance of Forecast Error of Yield Curve Factors, after the Global Financial Crisis
(Percent, 12-month average)



Source: Authors' calculations.

the close linkage between CGB factors and external market conditions, including the 10-year Treasury yield and the VIX.

Evidence from the policy bank bond market suggests that improving trading liquidity is key to boosting the CGB market's information efficiency and its policy transmission mechanism. In the period after the global financial crisis, policy bank bond levels have been more responsive than CGBs to changes in industrial production and the 7-day repo rate, likely a result of greater trading activities in that market. Greater market liberalization, including more active use of repo trading and hedging activities, more market-based open market operations from the PBC, and integration with the global system, can improve market liquidity for CGBs. In turn, a more robust and liquid CGB market will boost the overall efficiency of the Chinese capital market, proving the crucial benchmark for credit pricing that the country needs as it looks to further reform its economy and improve credit allocation.

Box 3.1. China's Monetary Policy Framework and Its Market Impact

The People's Bank of China (PBC) policy arsenal falls broadly into three categories (HE, WANG, and YU 2015; Girardin, Lunven, and MA 2014): (1) quantity-based instruments; (2) price-based instruments including lending rates, deposit rates, and open-market operations; and (3) administrative window guidance.

The PBC's quantity-based instruments toolkit revolves primarily around reserve requirements. By changing these, the PBC can effectively add or drain system liquidity, and the central bank has used changes in required reserve ratios to signal changes in its policy stance over the years.

That said, the PBC has also changed its reliance on different policy instruments. The required reserve ratio was its dominant policy instrument from the mid-2000s until around 2011. But it has increased the use of price-based, more market-oriented instruments; notably, open market operations began rising sharply in 2015. A significant strengthening of liquidity forecasting and management has enabled the greater reliance on price-based instruments.

Background

In the fall of 2017, China's 10-year sovereign bond yield briefly climbed above 4 percent for the first time in over three years. Market observers noted that this move signaled two developments: (1) PBC monetary policy increasingly resembles a standard interest-rate-based framework (see Harjes 2017); (2) the bond market plays an important role in the transmission of monetary policy, as actual and expected adjustments in the PBC's monetary policy stance are immediately reflected in longer-term bond yields. As the central bank's operations have changed, focus has shifted to the efficacy of the transmission channel of these new instruments and their impact on economic activity and inflation in China.

MA (2017) finds that changes in China's short-term interest rates have a noticeable impact on government bond yields of various maturities, but the transmission of short-term rates to longer-term bond yields is less effective in China than in other countries (India, the Republic of Korea, the United Kingdom, and the United States). He concludes that inadequate liquidity in segments of the bond market, underdevelopment of the market for derivatives, and restrictions on market access continue to weaken the interest rate transmission channel. Nevertheless, recent analysis (Harjes 2017) suggests a significant impact of changes in short-term interest rates on economic activity and, with some lag, on prices. These results are broadly in line with other studies, including Fernald, Spiegel, and Swanson (2014), who show that changes in Chinese interest rates have a substantial impact on economic activity and inflation, while other traditional measures of monetary conditions, such as shocks to M2, do not matter much any longer.

Evolution of China's Monetary Policy Framework

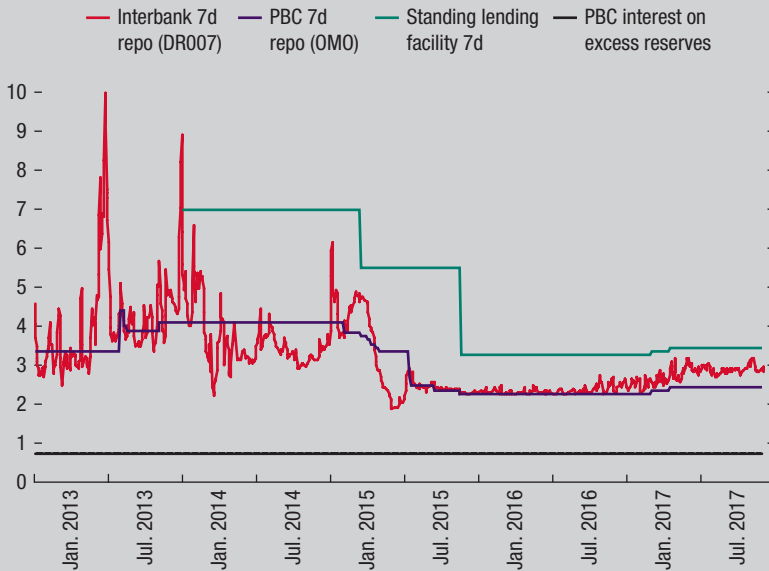
China has witnessed rapid financial innovation and undertaken significant financial market liberalization and reform, transforming its financial sector over the past few years. Banks still play a major role in financial intermediation, but other nonbank financial institutions and capital markets have become more prominent as a source of credit and in the provision of financial services to Chinese firms and households.

Overall, the financial system has become more market based but also more complex. In response, the PBC's operational conduct of monetary policy is relying increasingly on a standard, market-based system. While quantitative instruments still play a role, interest rates have become key instruments of monetary policy.

Box 3.1. China's Monetary Policy Framework and Its Market Impact *(continued)*

In late 2015, the PBC formally abolished the remaining constraints on bank lending and deposit rates, in theory to allow banks to set their own lending and deposit rates after the PBC previously had eliminated mandatory loan-to-deposit ratios and put less stress on credit quotas. Although money growth (M2) remains the official intermediate target (albeit for the first time, no quantitative number was published in the 2017 Government Work Plan presented to the National People's Congress), the central bank has clearly deemphasized its importance and indicated on several occasions that it is now using the 7-day interbank rate to send policy signals (PBC 2016). To do so, it has set a corridor around the 7-day rate, which has de facto been defined by the PBC's repo operations bid rate as the lower bound and the rate for the PBC's standing lending facility accessible by banks as the upper bound (Figure 3.1.1). To cap rates at the upper bound, the central bank accepts a relatively broad pool of collateral (including bank loans) for funds borrowed at the standing lending facility.

Figure 3.1.1. Interest Rate Corridor, January 2013 through October 2017 (Percent)



Source: Authors' calculations.

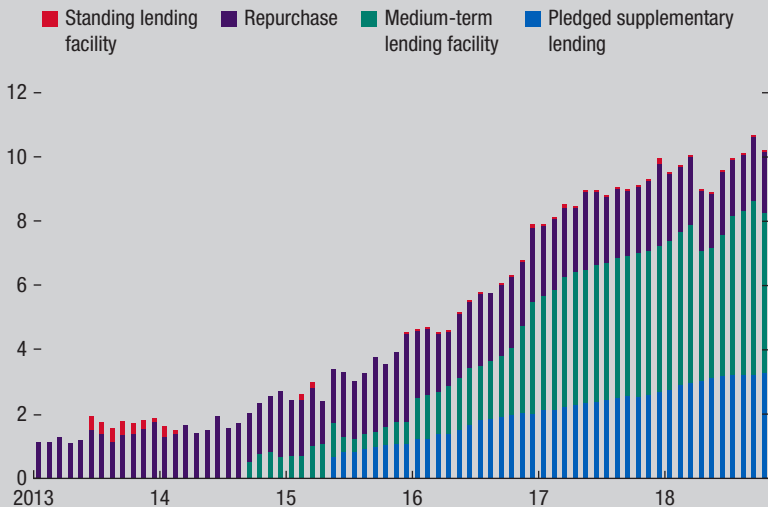
Note: 7d= 7-day; DR007 = interbank 7-day repo rate for depository financial institutions; OMO = open market operations; PBC = People's Bank of China; repo = repurchase.

Box 3.1. China's Monetary Policy Framework and Its Market Impact *(continued)*

Since mid-2015, the PBC has narrowed the corridor significantly and enforced a structural liquidity deficit in the banking sector that prevents the interbank rate from falling below the PBC's repo bid rate, as banks are competing for funds provided through open market operations.¹ This has kept the seven-day rate within the corridor while the central bank has nudged it up as the economy gathered pace in the second half of 2016 and as concerns about rapid credit growth and rising leverage came to the fore.

Complementing this shift has been the central bank's use of a range of liquidity management tools. After capital inflows and PBC reserve accumulation slowed and eventually turned into outflows and reserve sales in 2014, the rising demand for domestic liquidity had to be met with other policy tools: short-term open market liquidity operations, standing lending facilities, medium-term lending facilities, and pledged supplementary lending (Figure 3.1.2). With these tools, the PBC injected and occasionally withdrew cash at different rates and for different durations and improved its ability to manage daily cash levels. High volatility in money market rates, once a regular occurrence, has been reduced significantly (Figure 3.1.3).

Figure 3.1.2. The People's Bank of China's Outstanding Liquidity Tools, 2013–18
(Billions of renminbi)

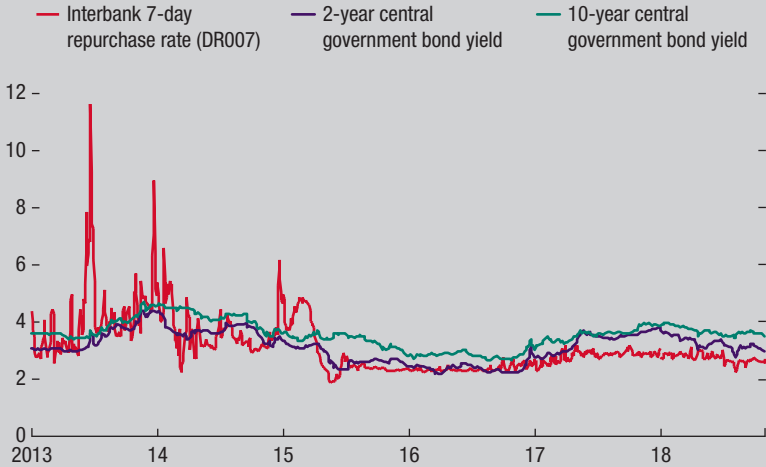


Source: CEIC.

¹ In a structural surplus (for example, in case of quantitative easing or large unsterilized foreign exchange purchases), the interest rate on excessive reserves for banks flush with cash would become the effective lower bound.

Box 3.1. China's Monetary Policy Framework and Its Market Impact (continued)

Figure 3.1.3. Fixed Income Instruments: 7-Day Repurchase Rate and 2- and 10-Year Central Government Bond Yields, 2013–18
(Percent)



Source: WIND Economic Database (www.wind.com.cn).

Note: DR007 = interbank 7-day repurchase rate for depository financial institutions.

Transmission of Monetary Policy

The interest rate channel is a key channel for transmission. A policy-induced increase in the short-term nominal interest rate leads first to an increase in longer-term nominal interest rates, as investors act to arbitrage away differences in risk-adjusted expected returns on debt instruments of various maturities, as described by the expectations hypothesis of the term structure. When nominal prices are slow to adjust, these movements in nominal interest rates translate into movements in real interest rates as well. Firms, finding that their real cost of borrowing over all horizons has increased, cut back on their investment expenditures. Likewise, households facing higher real borrowing costs scale back purchases of homes, automobiles, and other durable goods. Aggregate output and employment fall, putting downward pressure on inflation.

While an interest-rate-based monetary policy reduces the importance of money demand in the transmission of policy actions to the economy, it raises the prominence of the role played by the term structure of interest rates. Under the expectations hypothesis of the term structure, long-term nominal interest rates depend on expectations of future nominal short-term interest rates. These in turn crucially depend on expectations about future monetary policy (Walsh 2010). These are influenced by various factors, including economic activity, the output gap, the exchange rate, and inflation developments. However, long-term trends, such as demographics, saving patterns, and the future rate of technological progress that affect the so-called natural rate of interest also play an

Box 3.1. China's Monetary Policy Framework and Its Market Impact *(continued)*

important role in long-term yields. They may also reflect global factors and should therefore be less correlated with changes in the monetary policy stance.

There is a significant pass-through from the PBC's policy rates to the average bank lending rate. The historically close link between the PBC's benchmark rate for bank loans and the average bank lending rate reflects that the PBC's rates used to define the floor (abolished in 2013) for bank lending rates. Regressing the average lending rate on either the PBC benchmark rate or the (smoothed) interbank repo rate reveals a significant and high coefficient, of about 70 percent, for the benchmark rate, and about 30 percent for the repo rate. It is notable that the interbank rate spike in 2013 also pushed up the average bank lending rate as banks passed on the higher funding costs to protect their margins, notwithstanding the unchanged benchmark lending rate, signifying the increasing importance of the interbank repo rate.

Changes in policy rates also have a measurable impact on short-term government yields. The two-year government bond yield is an important determinant of longer-term and corporate bond yields and can serve as a measure of market expectations of monetary policy stance over the next couple of years. All policy rates are positively correlated with the two-year government bond yield. Bivariate vector autoregression analysis reveals an almost complete pass-through from PBC benchmark rate changes to government bond yields after about six months, but a lower (25 percent) pass-through for the interbank rate.

Against that background, a forward-looking and transparent monetary policy approach, clearly communicated with the markets and public about its plans, objectives, and policy decisions, now seems the most effective and efficient way for the PBC to conduct its policy.

Box 3.2. The Role of Policy Banks in China's Bond Market

Bonds issued by three policy banks—the China Development Bank, the Export-Import Bank of China, and the Agricultural Development Bank of China—have played an important role in fostering interbank bond market development in China.

These banks primarily issue bonds to fund lending to the targeted sectors with policy mandates. For example, the China Development Bank lends to support infrastructure projects undertaken by local governments; the Export-Import Bank of China lends to promote trade and support the export-oriented manufacturing sector; and the Agricultural Development Bank of China provides funding to improve water conservancy and farming facilities in rural areas.

Given that the bonds issued by policy banks are backed by the central government, investors perceive these bonds as risk free. Banks purchase policy bank bonds largely for liquidity management, as the bonds can be used as collateral in the repo markets or borrowing from the People's Bank of China (PBC). Some prefer investing in policy bank bonds to central government bonds (CGBs) given their relatively higher yields—as domestic investors must pay tax on their policy bank bond holdings while CGB coupons are tax free (Figure 3.2.1). Given the higher yield and virtually risk-free nature of policy bank bonds, the demand for these bonds has been growing. Total market size has been catching up with CGBs in recent years (Figure 3.2.2).

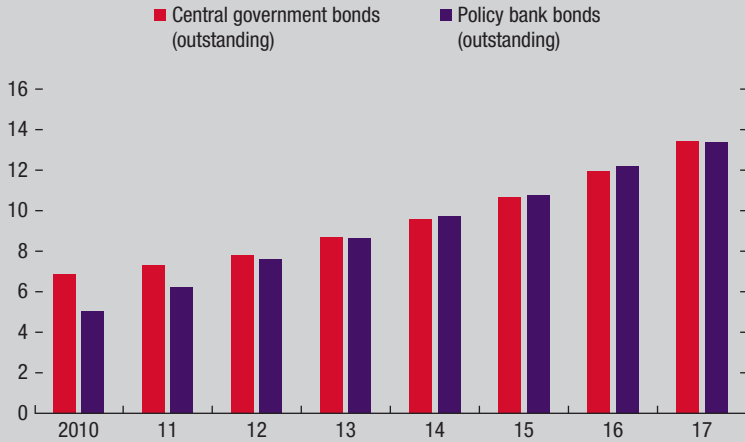
Figure 3.2.1. Yield of China Development Bank Bonds versus Central Government Bonds, 2010–18
(Percent per year)



Source: WIND Economic Database (www.wind.com.cn).

Box 3.2. The Role of Policy Banks in China's Bond Market (continued)

Figure 3.2.2. Outstanding Central Government Bonds and Policy Bank Bonds, 2010–17
(Trillions of renminbi)

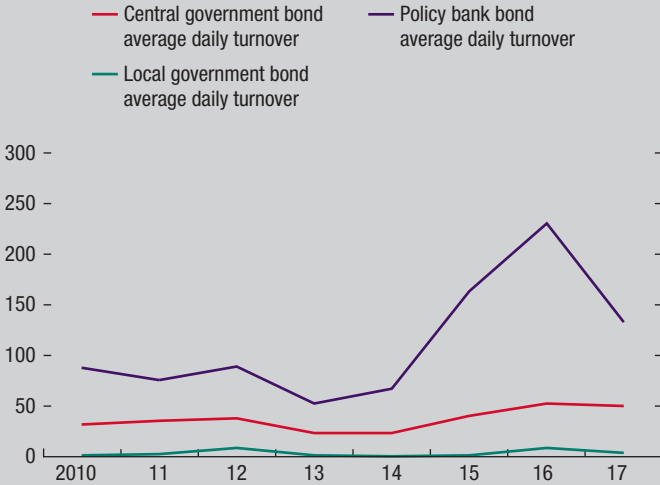


Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Policy bank bonds are more actively traded in the secondary market than are other types of public sector bonds. The average daily turnover of policy bank bonds is almost twice that of CGBs (Figure 3.2.3). A crucial factor that has supported market liquidity is the high level of liquidity for benchmark issues. Unlike CGBs, recently issued on-the-run policy bank bond papers can be reopened—and often are, thus deepening the trading liquidity of these papers. Moreover, the jump in bond default cases in 2016 heightened risk aversion, resulting in flight to quality by bond investors. Portfolio shift from high-yield corporate bonds to risk-free assets boosted the demand for policy bank bonds, and trading of this paper rose markedly (Figure 3.2.4).

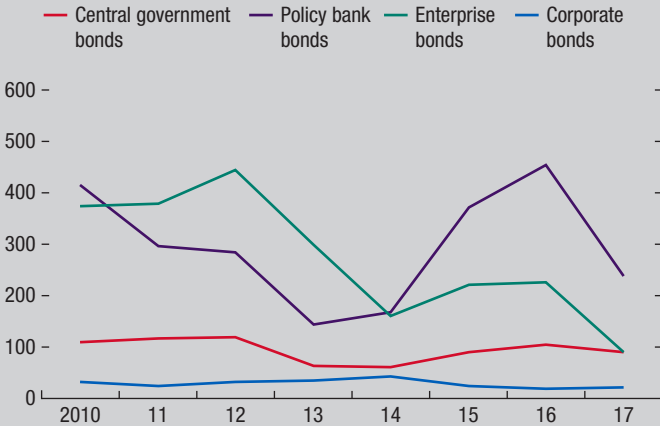
Box 3.2. The Role of Policy Banks in China's Bond Market (continued)

Figure 3.2.3. Daily Turnover of Public Sector Bonds, 2010–17
(Billions of renminbi)



Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Figure 3.2.4. Ratio of Annual Turnover to Outstanding, 2010–17
(Percent)



Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Box 3.2. The Role of Policy Banks in China's Bond Market (continued)

Figure 3.2.5. Daily Turnover of Policy Bank Bonds, by Tenor, 2011, 2014, and 2017
(Billions of renminbi)



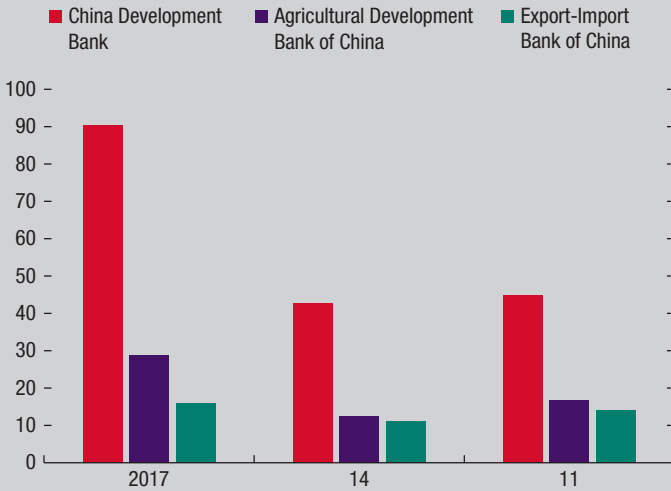
Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Another factor that supported policy bank bonds trading liquidity is the opening up of the domestic bond market to foreign investors. Appetite for policy bank bonds, particularly longer-dated, higher-yielding bonds, was strong among foreign investors. As a result, the turnover of 10-year policy bank bonds surged in 2017, surpassing the turnover of shorter-term maturities, 1-year or below, the segment with highest turnover in the past (Figure 3.2.5).

Finally, the launch of a number of bond indices by investment banks that track the return on policy bank bonds, such as China Development Bank bonds, is also driving the increase in trading liquidity. Notably, most of the surge in turnover of policy bank bonds in recent years has been largely concentrated in bonds issued by the China Development Bank, given its more regular issuance schedule and higher turnover in the secondary market (Figure 3.2.6).

Box 3.2. The Role of Policy Banks in China's Bond Market (continued)

Figure 3.2.6. Daily Turnover of Policy Bank Bonds, by Issuer, 2011, 2014, and 2017
(Billions of renminbi)

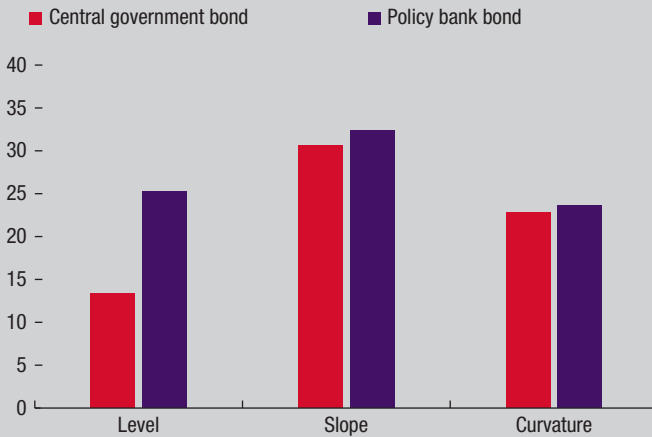


Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Policy bank bonds, reflecting risk-free status and higher liquidity, in practice provide another benchmark yield curve in China. The China Development Bank yield curve is highly correlated with the central government curve—0.6 for the level factor and 0.9 for the slope factor. Applying the same vector autoregression analysis for CGBs to these policy bank bonds, their level factors have been more responsive to domestic shocks since the global financial crisis (2008:M1–2017:M12). The decomposition of the variance of forecast errors shows that shocks from industrial production, inflation, and the 7-day repo rate in total contributed 25 percent of the variance of the level factor of the policy bank bond versus 14 percent for the CGB (Figure 3.2.7). For the slope and curvature factors, the responsiveness of the policy bank bond is also marginally higher than the CGB.

Box 3.2. The Role of Policy Banks in China's Bond Market (continued)

Figure 3.2.7. Contribution from Domestic Shocks to Variance of Forecast Error of Yield Curve Factors after the Global Financial Crisis
(Percent, 12-month average)



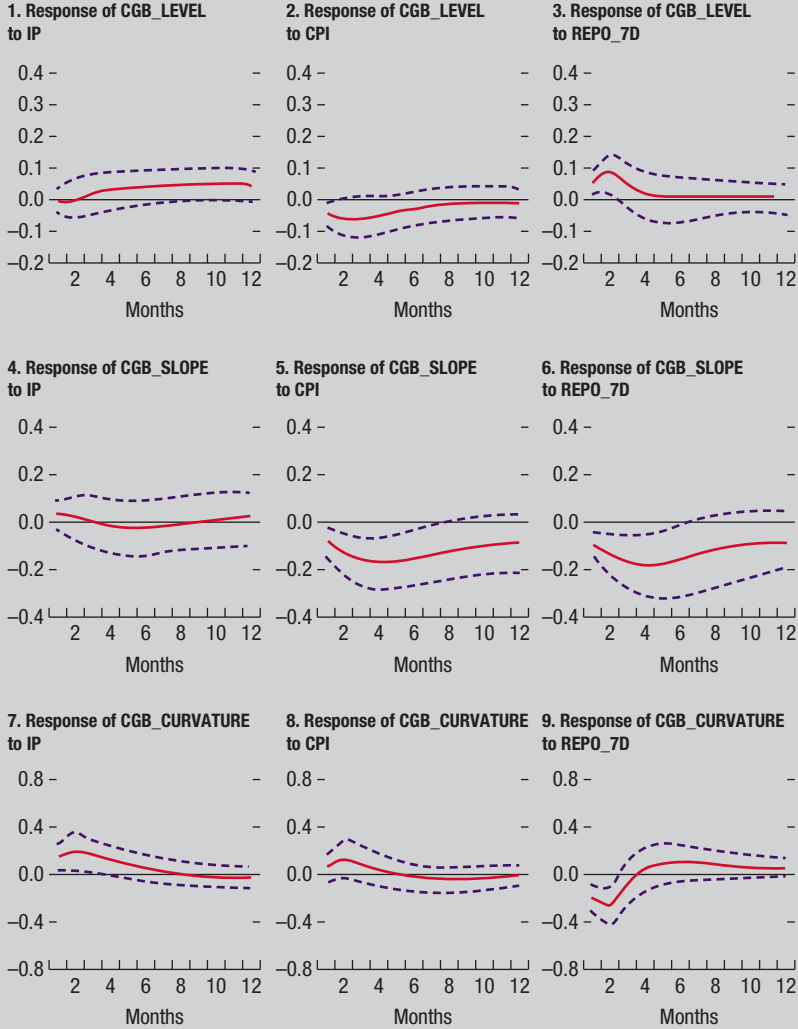
Source: Authors' calculations.

Impulse response results show a similar picture. A one standard deviation shock to industrial production could lead to a 0.05 standard deviation increase in the level factor of a policy bank bond, while a one standard deviation shock to the repo rate would increase the level factor by 0.1 standard deviation after six months (Figure 3.2.8). In contrast, the impact of an industrial production and repo rate shock on the level factor of the CGB yield is relatively small and not statistically significant.

For the slope factor, both policy bank and central government bonds have a similar response to an inflation shock. A one standard deviation shock from consumer price index (CPI) inflation tends to flatten the slope of both yield curves as short-term yields moved up faster than long-term yields. The greater sensitivity suggests that policy bank bonds exhibit better monetary policy transmission, likely a result of their deeper market liquidity and more efficient incorporation of new data and policy changes.

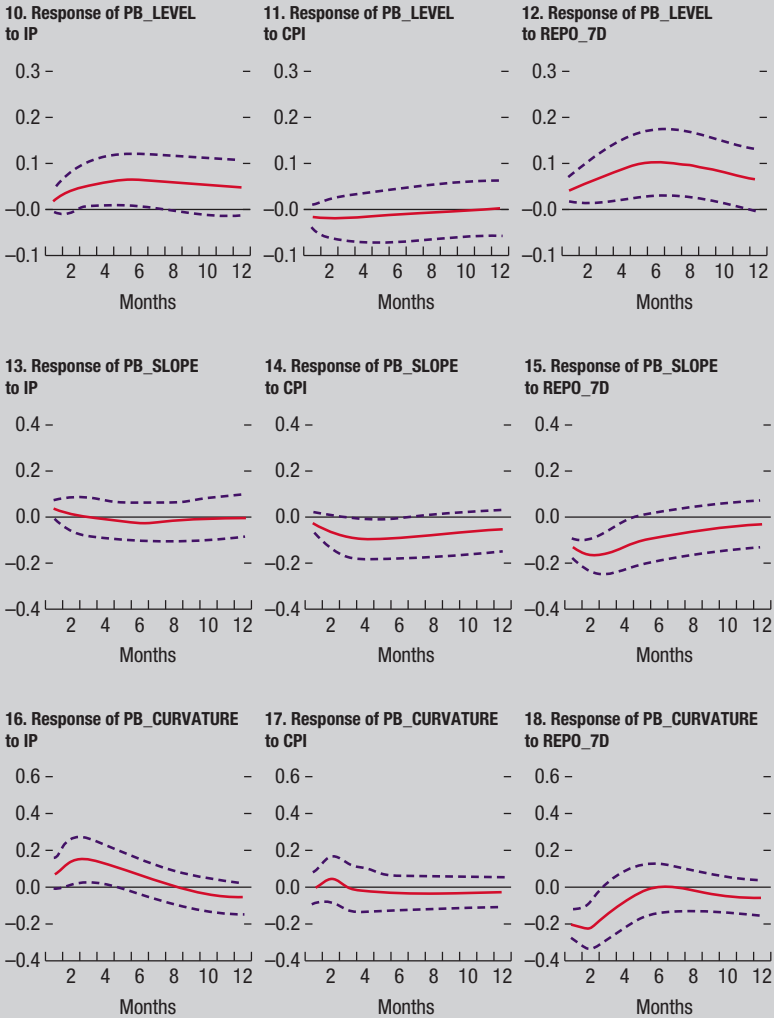
Box 3.2. The Role of Policy Banks in China's Bond Market (continued)

Figure 3.2.8. Impulse Response of Central Government Bonds and Policy Bank Bonds to Domestic Shocks after the Global Financial Crisis
(Percentage points)



Box 3.2. The Role of Policy Banks in China's Bond Market
(continued)

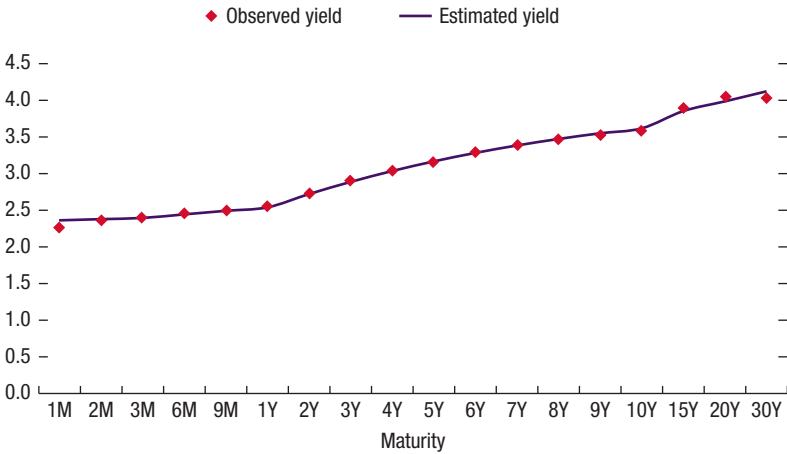
Figure 3.2.8. Impulse Response of Central Government Bonds and Policy Bank Bonds to Domestic Shocks after the Global Financial Crisis (Continued)
(Percentage points)



Source: Authors' calculations.

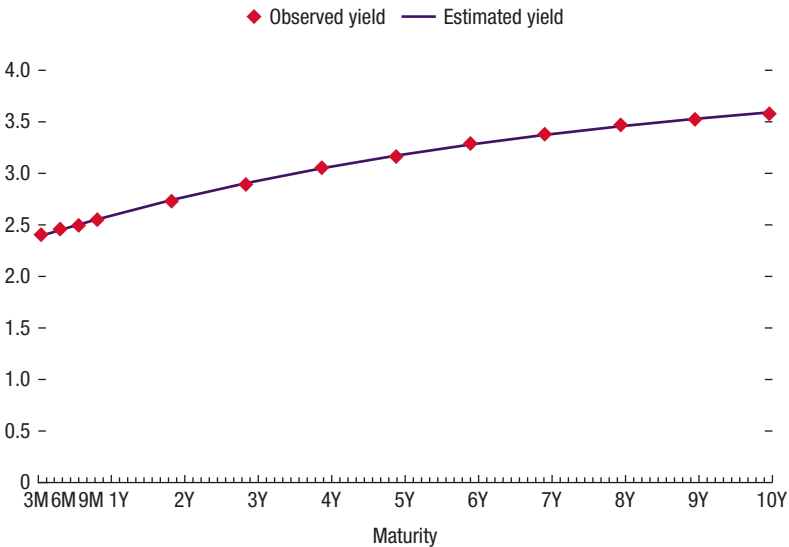
Note: Vector autoregression with two lags and six variables including industrial production (IP) growth, consumer price index (CPI) inflation, 7-day repurchase (repo) rate, and the three yield curve factors of central government bonds (CGBs) versus policy bank bonds. Impulse response is estimated by the Cholesky method. Panels are shown in the following sequence: response of level, slope, and curvature of CGB yield curve to one standard deviation shock from industrial production growth, CPI inflation, and 7-day repo rate during the post-global financial crisis period; response of level, slope, and curvature of policy bank bond yield curve to one standard deviation shock from industrial production growth, CPI inflation, and 7-day repo rate during the post-global financial crisis period from January 2008 to December 2017.

Annex Figure 3.1.1. Estimated and Observed Central Government Bond Yield Curves
(Percent per year)



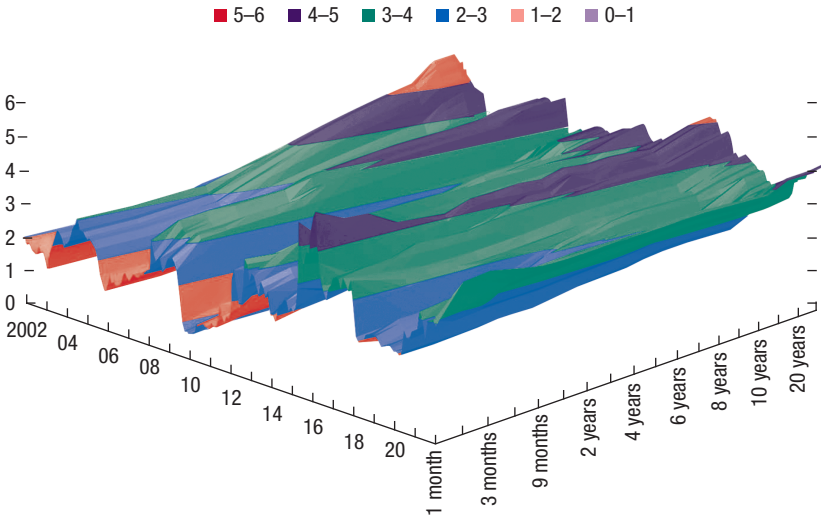
Source: Authors' calculations.
 Note: M = month; Y = year.

Annex Figure 3.1.2. Robustness Test: Estimated Central Government Bond Yield Curves Using 3-Month to 10-Year Yields
(Percent per year, average yield curve fitting, 3-month to 10-year)



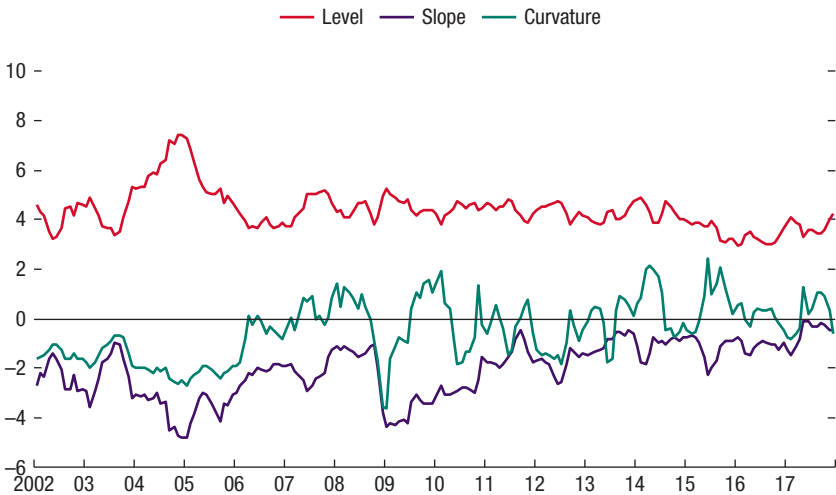
Source: Authors' calculations.
 Note: M = month; Y = year.

Annex Figure 3.1.3. Observed Central Government Bond Yield Curves, 2002–17
(Percent per year)



Source: Authors' calculations.

Annex Figure 3.1.4. Robustness Test: Estimated Factors for the Government Bond Yield Curve Factors Using 3-Month to 10-Year Yields
(Percent)



Source: Authors' calculations.

ANNEX TABLE 3.1.1.

Model Descriptive Statistics: Average Observed Central Government Bond Yields				
Maturity	Mean	Standard Deviation	Minimum	Maximum
1-month	2.26	0.76	0.72	4.98
2-month	2.37	0.76	0.79	4.63
3-month	2.40	0.75	0.82	4.60
6-month	2.46	0.73	0.86	4.21
9-month	2.50	0.72	0.87	4.15
1-year	2.55	0.72	0.93	4.08
2-year	2.74	0.70	1.20	4.35
3-year	2.90	0.64	1.36	4.38
4-year	3.05	0.61	1.67	4.47
5-year	3.16	0.59	1.98	4.43
6-year	3.29	0.58	2.17	4.61
7-year	3.38	0.56	2.31	4.67
8-year	3.46	0.56	2.37	4.88
9-year	3.53	0.57	2.43	5.07
10-year	3.58	0.57	2.49	5.24
15-year	3.90	0.57	2.75	5.82
20-year	4.06	0.57	2.94	5.94
30-year	4.03	0.54	2.76	5.53
Slope	1.78	0.66	-0.51	3.27
Curvature	-0.60	0.40	-1.48	1.22

Source: Authors' calculations.

ANNEX TABLE 3.1.2.

Model Descriptive Statistics: Estimated Factors								
Factor	Mean	Standard			$\rho(1)$	$\rho(3)$	$\rho(12)$	$\rho(60)$
		Deviation	Minimum	Maximum				
Level	4.40	0.63	3.26	6.68	0.44	0.45	0.15	0.10
Slope	-2.05	0.89	-4.05	-0.50	0.32	0.51	0.25	0.18
Curvature	-0.97	0.82	-2.89	0.67	0.37	0.22	0.11	-0.29

Source: Authors' calculations.

Note: $\rho(1)$, $\rho(3)$, $\rho(12)$, and $\rho(60)$ are sample autocorrelations at displacements of 1, 3, 12, and 60 months, that is, relationships between movements of observations at month (n) and the factor estimates.

ANNEX TABLE 3.1.3.

Model Descriptive Statistics: Yield Curve Residuals				
Maturity	Mean	Standard Deviation	Minimum	Maximum
1-month	-0.11	0.24	-0.87	0.94
2-month	-0.01	0.07	-0.23	0.26
3-month	0.00	0.04	-0.15	0.16
6-month	0.01	0.05	-0.21	0.20
9-month	0.00	0.07	-0.26	0.22
1-year	0.01	0.08	-0.37	0.22
2-year	0.02	0.08	-0.30	0.17
3-year	0.01	0.05	-0.16	0.14
4-year	0.01	0.04	-0.09	0.16
5-year	-0.01	0.03	-0.09	0.10
6-year	0.01	0.04	-0.05	0.16
7-year	0.00	0.02	-0.06	0.06
8-year	-0.01	0.03	-0.06	0.07
9-year	-0.03	0.04	-0.13	0.11
10-year	-0.04	0.07	-0.16	0.15
15-year	0.04	0.08	-0.11	0.25
20-year	0.07	0.07	-0.10	0.25
30-year	-0.09	0.36	-2.03	0.31
Slope	0.02	0.48	-2.07	0.97
Curvature	-0.10	0.19	-0.72	0.81

Source: Authors' calculations.

ANNEX TABLE 3.1.4.

Robustness Test: Model Descriptive Statistics: Estimated Factors for the 3-Month to 10-Year Curve								
Factor	Mean	Standard Deviation	Minimum	Maximum	$\rho(1)$	$\rho(3)$	$\rho(12)$	$\rho(60)$
Level	4.36	0.83	2.94	7.44	0.88	0.55	0.30	0.10
Slope	-2.02	1.11	-4.84	-0.10	0.87	0.53	0.22	0.27
Curvature	-0.47	1.21	-3.63	2.44	0.74	0.31	0.10	-0.21

Source: Authors' calculations.

Note: $\rho(1)$, $\rho(3)$, $\rho(12)$, and $\rho(60)$ are sample autocorrelations at displacements of 1, 3, 12, and 60 months, that is, relationships between movements of observations at month (n) and the factor estimates.

ANNEX TABLE 3.1.5.

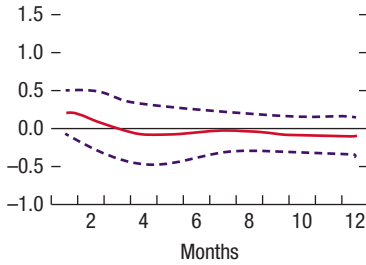
Decomposition of Forecast Error Variance of Consumer Price Index Inflation to Central Government Bond Yield Curve Shock, after the Global Financial Crisis						
Month	CGB_LEVEL	CGB_SLOPE	CGB_CURVATURE	IP	CPI	REPO_7D
1	4.03	1.24	0.00	6.02	88.72	0.00
2	5.73	2.33	1.73	15.49	74.46	0.25
3	8.32	3.42	4.61	19.75	63.36	0.54
4	10.14	3.82	7.52	23.15	54.50	0.87
5	11.23	3.82	10.09	25.70	47.86	1.30
6	11.80	3.56	12.14	27.78	42.95	1.77
7	12.02	3.21	13.69	29.58	39.28	2.22
8	12.01	2.89	14.80	31.18	36.49	2.63
9	11.85	2.65	15.56	32.62	34.35	2.96
10	11.61	2.55	16.04	33.91	32.68	3.22
11	11.31	2.61	16.31	35.03	31.35	3.40
12	10.99	2.83	16.41	35.97	30.27	3.51

Source: Authors' calculations.

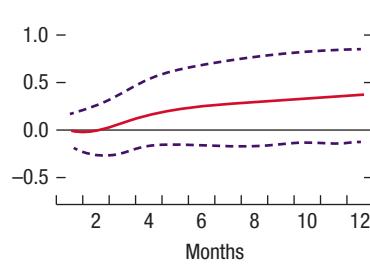
Note: Cholesky ordering: CGB_LEVEL; CGB_SLOPE; CGB_CURVATURE; IP; CPI; REPO_7D. 7D = 7-day; CGB = central government bond; CPI = consumer price inflation; IP = industrial production growth; repo = repurchase.

Annex Figure 3.1.5. Impulse Response of Industrial Production Growth and CPI Inflation to Central Government Bond Yield Curve Factor Shocks, before and after the Global Financial Crisis
(Percentage points)

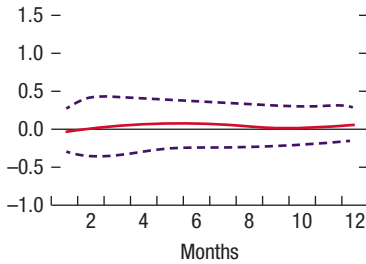
1. Pre-GFC: Response of IP to CGB_LEVEL



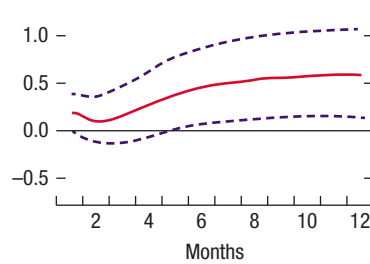
2. Post-GFC: Response of IP to CGB_LEVEL



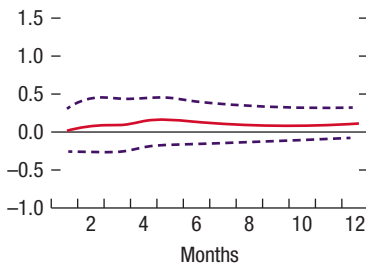
3. Pre-GFC: Response of IP to CGB_SLOPE



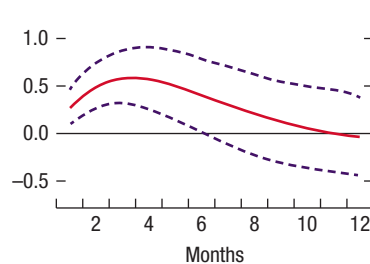
4. Post-GFC: Response of IP to CGB_SLOPE



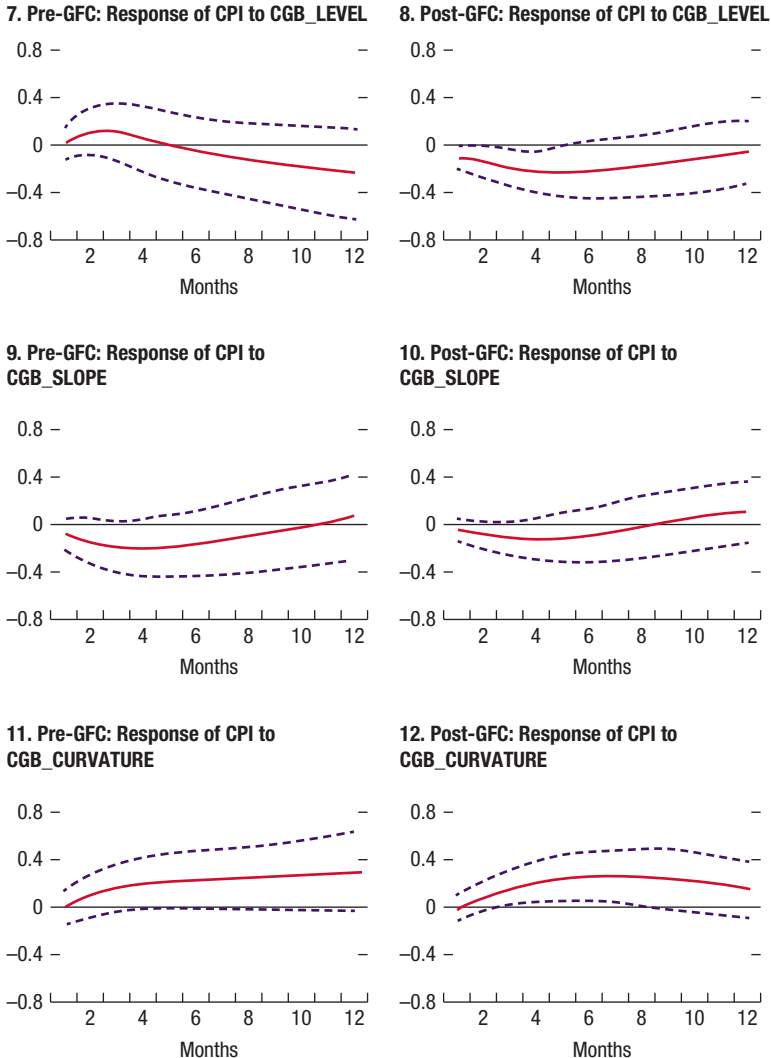
5. Pre-GFC: Response of IP to CGB_CURVATURE



6. Post-GFC: Response of IP to CGB_CURVATURE



Annex Figure 3.1.5. Impulse Response of Industrial Production Growth and CPI Inflation to Central Government Bond Yield Curve Factor Shocks, before and after the Global Financial Crisis (continued)
(Percentage points)

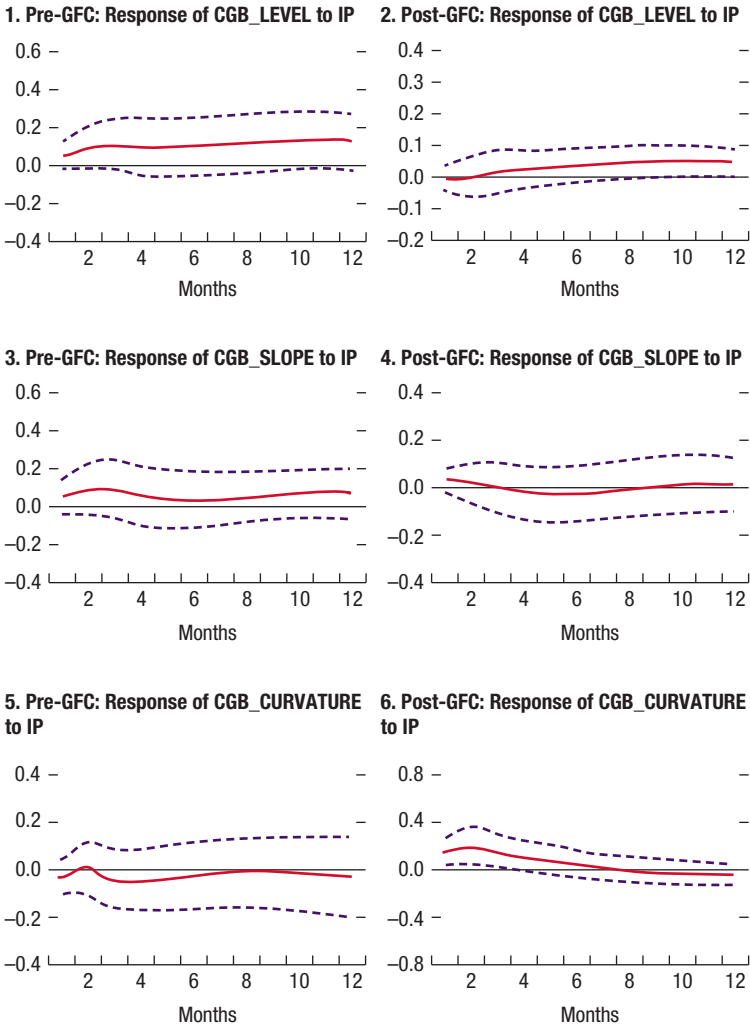


Source: Authors' calculations.

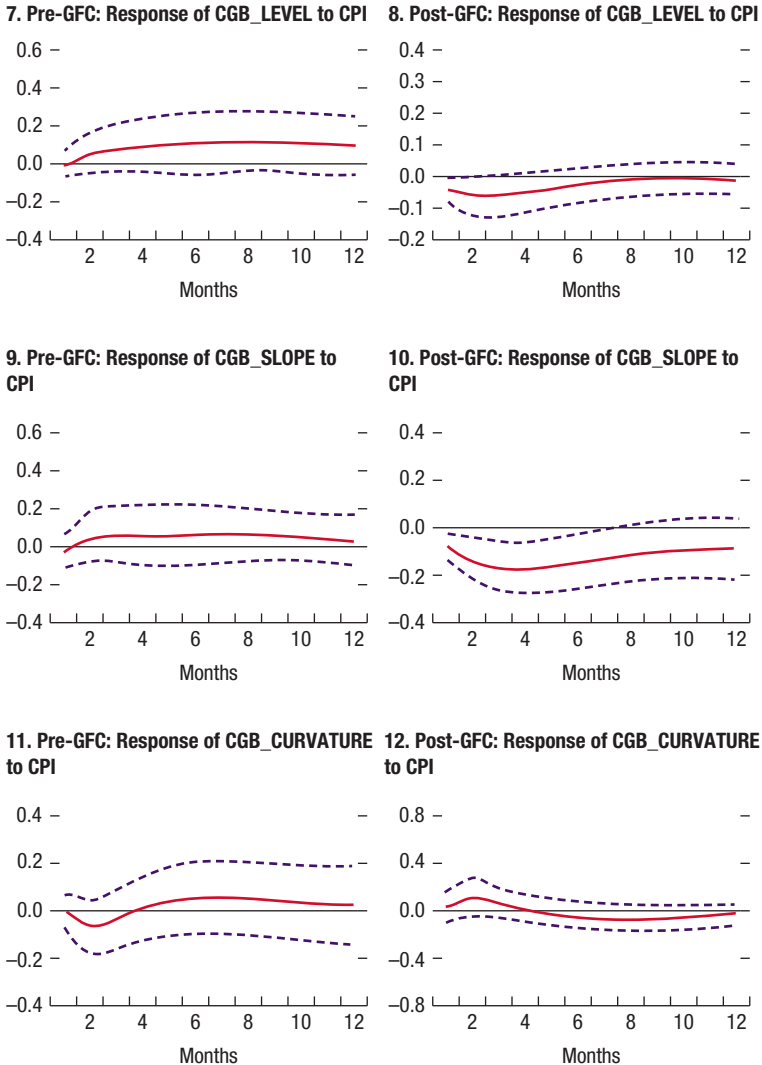
Note: Vector autoregression (VAR) with two lags and six variables including three central government bond (CGB) factors, industrial production (IP) growth, and consumer price index (CPI) inflation. Impulse response is estimated by the Cholesky method. Panels are shown in the following sequence: response of IP growth to one standard deviation of shock from level, slope, and curvature of CGB yield curve; response of CPI inflation to one standard deviation of shock from level, slope, and curvature of CGB yield curve. GFC = global financial crisis; pre-GFC = January 2002 to December 2007; post-GFC = January 2008 to December 2017.

Annex Figure 3.1.6. Impulse Response of Central Government Bond Factors to Industrial Production Growth, Consumer Price Index Inflation, and Repo Rate Shocks, before and after the Global Financial Crisis

(Percentage points)

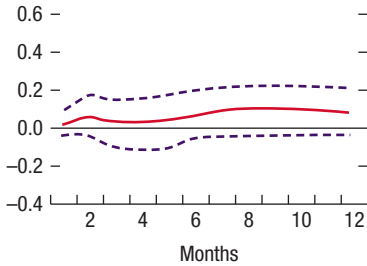


Annex Figure 3.1.6. Impulse Response of Central Government Bond Factors to Industrial Production Growth, Consumer Price Index Inflation, and Repo Rate Shocks, before and after the Global Financial Crisis (*continued*)
(Percentage points)

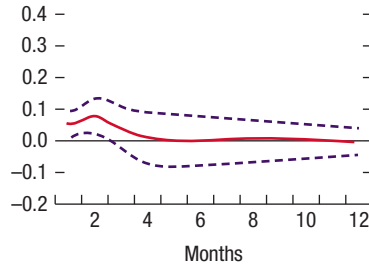


Annex Figure 3.1.6. Impulse Response of Central Government Bond Factors to Industrial Production Growth, Consumer Price Index Inflation, and Repo Rate Shocks, before and after the Global Financial Crisis (*continued*)
(Percentage points)

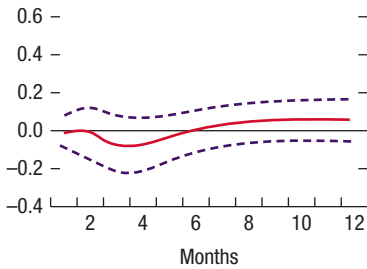
13. Pre-GFC: Response of CGB_LEVEL to REPO_7D



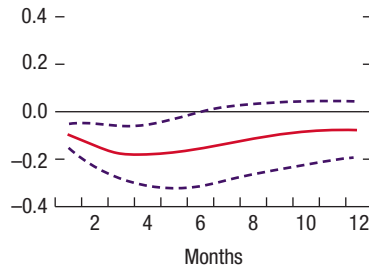
14. Post-GFC: Response of CGB_LEVEL to REPO_7D



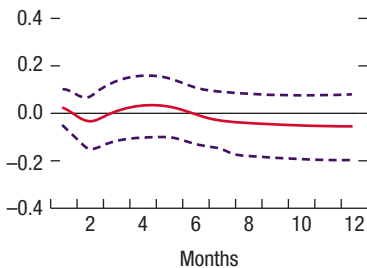
15. Pre-GFC: Response of CGB_SLOPE to REPO_7D



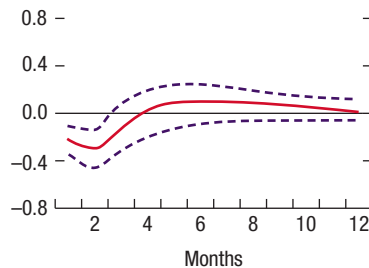
16. Post-GFC: Response of CGB_SLOPE to REPO_7D



17. Pre-GFC: Response of CGB_CURVATURE to REPO_7D



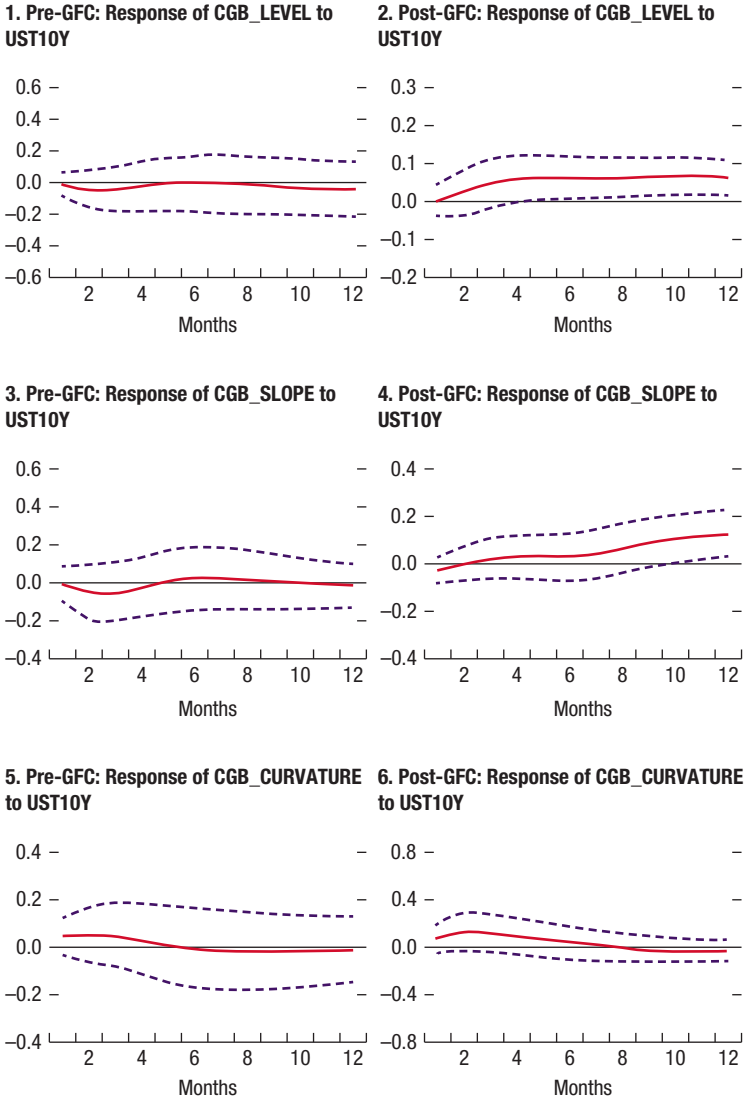
18. Post-GFC: Response of CGB_CURVATURE to REPO_7D



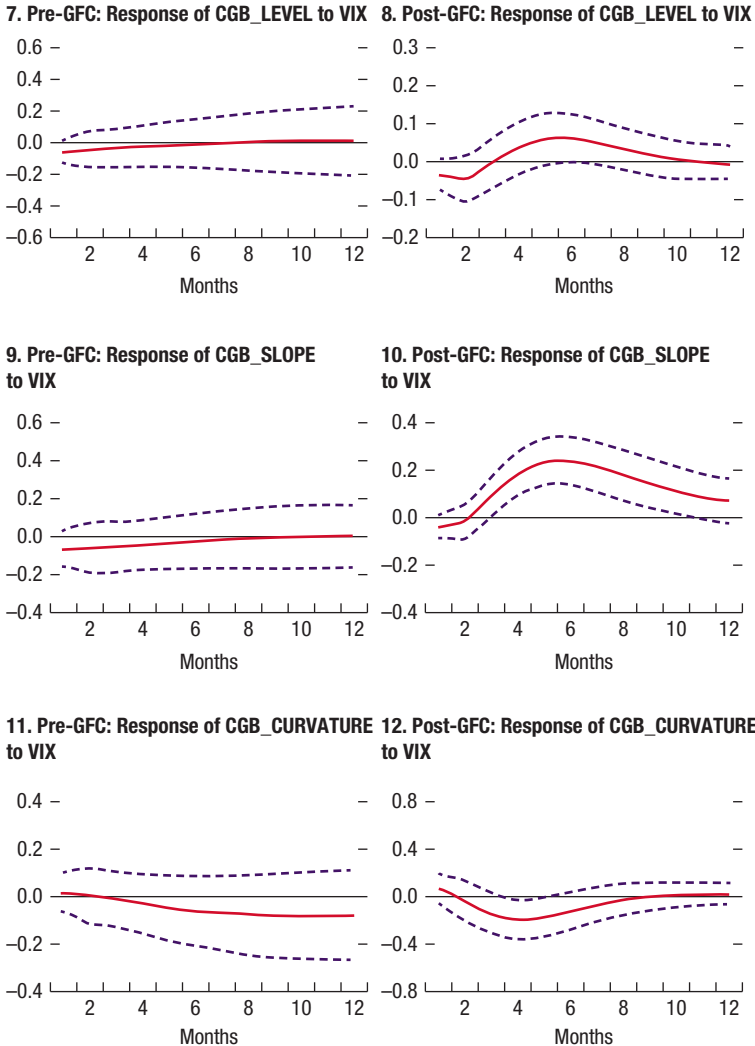
Source: Authors' calculations.

Note: Vector autoregression (VAR) with two lags and six variables including industrial production (IP) growth, consumer price index (CPI) inflation, 7-day repurchase (repo) rate (REPO_7D), and three central government bond (CGB) factors. Impulse response is estimated by Cholesky method. Panels are shown in the following sequence: response of level, slope, and curvature of CGB yield curve to one standard deviation shock from IP growth; response of level, slope, and curvature of CGB yield curve to one standard deviation shock from CPI inflation; response of level, slope, and curvature of CGB yield curve to one standard deviation shock from 7-day repo rate. GFC = global financial crisis; pre-GFC = January 2002 to December 2007; post-GFC = January 2008 to December 2017.

Annex Figure 3.1.7. Impulse Response of Central Government Bond Factors to US Treasury 10-Year Yield and Volatility (VIX) Shocks, before and after the Global Financial Crisis
(Percentage points)



Annex Figure 3.1.7. Impulse Response of Central Government Bond Factors to US Treasury 10-Year Yield and Volatility (VIX) Shocks, before and after the Global Financial Crisis (*continued*)
(Percentage points)



Source: Authors' calculations.

Note: Vector autoregression (VAR) with two lags and five variables including US Treasury 10-year yield (UST10Y), Chicago Board Options Exchange Volatility Index (VIX), and three central government bond (CGB) factors. Impulse response is estimated by Cholesky method. Panels are shown in the following sequence: response of level, slope, and curvature of CGB yield curve to one standard deviation shock from US Treasury 10-year yield; response of level, slope, and curvature of CGB yield curve to one standard deviation shock from VIX. pre-GFC = January 2002 to December 2007; post-GFC = January 2008 to December 2017.

ANNEX TABLE 3.1.6.

Forecast Error Variance Decomposition: Changes in Central Government Bond Factors to Domestic and External Shocks, before the Global Financial Crisis

Variance Decomposition of CGB_LEVEL

Month	UST10Y	VIX	REPO_7D	IP	CPI
1	1.43	2.92	0.93	1.95	0.03
2	3.66	1.58	2.36	3.98	1.13
3	4.73	1.04	1.79	6.00	1.97
4	4.86	1.32	1.80	7.21	3.27
5	4.34	1.54	2.48	8.49	4.67
6	3.86	1.71	3.72	9.50	6.28
7	3.53	1.86	4.91	10.11	8.05
8	3.34	2.08	5.93	10.46	9.81
9	3.26	2.34	6.82	10.76	11.37
10	3.22	2.64	7.63	11.08	12.71
11	3.22	2.96	8.32	11.39	13.87
12	3.23	3.30	8.90	11.64	14.91

Variance Decomposition of CGB_SLOPE

Month	UST10Y	VIX	REPO_7D	IP	CPI
1	1.22	3.21	0.00	1.71	0.43
2	4.63	2.68	0.01	3.04	0.65
3	6.48	2.19	0.62	3.57	0.68
4	6.82	1.90	0.81	3.76	0.78
5	6.37	1.73	0.74	4.19	0.89
6	5.92	1.61	0.87	4.60	1.10
7	5.55	1.52	1.07	4.84	1.41
8	5.29	1.43	1.25	4.96	1.74
9	5.14	1.37	1.45	5.10	2.00
10	5.05	1.35	1.68	5.29	2.20
11	5.03	1.38	1.92	5.52	2.38
12	5.05	1.46	2.16	5.77	2.56

Variance Decomposition of CGB_CURVATURE

Month	UST10Y	VIX	REPO_7D	IP	CPI
1	3.15	0.31	0.42	0.19	0.09
2	5.95	0.21	0.91	0.23	2.44
3	7.68	0.36	0.84	0.40	1.91
4	8.58	0.62	0.96	0.68	1.61
5	7.98	0.96	0.96	1.15	1.96
6	7.21	1.36	0.84	1.51	2.40
7	6.55	1.68	0.80	1.59	2.62
8	6.06	2.06	0.83	1.52	2.59
9	5.68	2.51	0.93	1.43	2.45
10	5.37	3.07	1.11	1.36	2.29
11	5.10	3.74	1.36	1.33	2.15
12	4.87	4.53	1.65	1.34	2.05

Source: Authors' calculations.

Note: Cholesky ordering: UST10Y; VIX; REPO_7D; IP; CPI; CGB_LEVEL; CGB_SLOPE; CGB_CURVATURE. Tables of variance decomposition are shown in the sequence of level, slope, and curvature of the CGB (central government bond) yield curve to shocks from US Treasury 10-year yield (UST10Y), VIX (Chicago Board Options Exchange Volatility Index), 7-day repurchase (repo) rate (REPO-7D), industrial production growth (IP), and consumer price index (CPI) inflation during the period January 2002 (2002:M1) to December 2007 (2007:M12).

ANNEX TABLE 3.1.7.

Forecast Error Variance Decomposition: Changes in Central Government Bond Factors to Domestic and External Shocks, after the Global Financial Crisis

Variance Decomposition of CGB_LEVEL					
Month	UST10Y	VIX	REPO_7D	IP	CPI
1	0.04	2.23	13.29	0.42	2.76
2	0.47	2.53	19.35	0.24	2.21
3	1.32	1.88	20.07	0.40	2.16
4	2.10	2.78	19.93	0.69	2.18
5	2.69	4.61	19.77	0.87	2.15
6	3.25	5.95	19.71	0.97	2.09
7	3.90	6.44	19.65	1.07	2.03
8	4.68	6.46	19.47	1.24	2.00
9	5.52	6.36	19.18	1.51	2.00
10	6.35	6.25	18.84	1.89	2.02
11	7.12	6.14	18.52	2.34	2.04
12	7.79	6.04	18.24	2.81	2.04

Variance Decomposition of CGB_SLOPE					
Month	UST10Y	VIX	REPO_7D	IP	CPI
1	0.81	1.46	4.66	0.73	1.82
2	0.40	0.66	4.18	0.47	2.74
3	0.62	6.72	4.36	0.51	4.25
4	0.73	20.15	4.11	0.38	5.59
5	0.78	31.49	3.53	0.52	6.23
6	0.94	37.60	3.09	1.00	6.45
7	1.40	40.11	2.88	1.55	6.44
8	2.26	40.77	2.85	2.00	6.30
9	3.57	40.59	2.96	2.26	6.08
10	5.23	40.05	3.12	2.37	5.83
11	7.12	39.38	3.28	2.39	5.58
12	9.10	38.65	3.42	2.37	5.34

Variance Decomposition of CGB_CURVATURE					
Month	UST10Y	VIX	REPO_7D	IP	CPI
1	0.50	0.75	18.42	4.35	0.57
2	1.96	0.48	26.80	5.39	2.01
3	3.35	2.27	24.69	5.80	2.18
4	4.68	4.39	22.09	5.98	2.01
5	5.47	5.72	20.57	6.08	1.87
6	5.75	6.17	19.84	6.10	1.85
7	5.78	6.18	19.59	6.05	1.94
8	5.72	6.10	19.59	5.98	2.12
9	5.67	6.07	19.71	5.94	2.33
10	5.63	6.07	19.83	5.96	2.53
11	5.61	6.08	19.92	6.05	2.68
12	5.61	6.07	19.96	6.20	2.79

Source: Authors' calculations.

Note: Cholesky ordering: UST10Y; VIX; REPO_7D; IP; CPI; CGB_LEVEL; CGB_SLOPE; CGB_CURVATURE. Tables of variance decomposition are shown in the sequence of level, slope, and curvature of CGB yield curve to shocks from US Treasury 10-year (UST10Y) yield, Chicago Board Options Exchange Volatility Index (VIX), 7-day repurchase (repo) rate, industrial production (IP) growth, and consumer price index (CPI) inflation during the period January 2008 (2008:M1) to December 2017 (2017:M12).

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Credit Bonds

ZHANG Longmei and WU Yuchen

China's credit bond market has grown rapidly in recent decades. Since 1983, when China's first enterprise bond was issued, the credit bond market has expanded from enterprise bonds to new products such as corporate bonds and medium-term notes, among others. By the end of 2017, outstanding credit bonds reached \$2.7 trillion, the second-largest market in the world after the United States (Figure 4.1).

Bond financing remains a small portion of corporate financing in China, however, suggesting that there is still significant room for expansion (Figure 4.2). Credit bonds account for only 30 percent of GDP and 10 percent of total financing of nonfinancial corporations. Banks continue to dominate, with bank loans accounting for 70 percent of corporate financing, compared to around 10 percent in the United States. As the financial system moves toward direct financing, credit bonds are likely to continue growing rapidly in the long term.

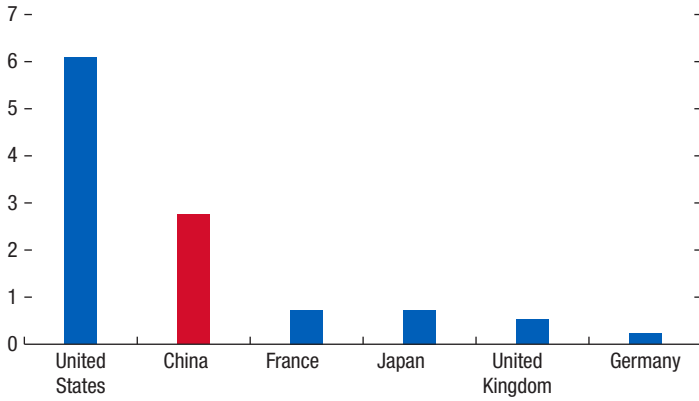
Foreign participation remains extremely low, accounting for only 1 percent of the overall market, compared to 29 percent in the United States. Recent measures to open up the bond market, such as granting institutional investors direct access to the interbank market and Bond Connect,¹ have mostly attracted foreign inflows to the sovereign bond market rather than to credit bonds. Significant room for increased foreign participation remains.

Despite the huge potential, China's credit bond market is beset by several issues that will be important to overcome. First, the market is highly segmented, with different bonds subject to different regulatory requirements and traded and settled on different platforms. Second, reflecting market-perceived government guarantees, especially for state-owned enterprises (SOEs) and local government financing vehicles (LGFVs), credit ratings appear to be distorted—with more than 90 percent of credit bonds rated above AA. While the government has recently issued a series of new regulations to break such implicit guarantees, in practice they still exist. Hence, bond pricings may not adequately reflect

The authors thank CHEN Wanhong of the National Development and Reform Commission and LU Dabiao of the China Securities Regulatory Commission for helpful comments.

¹ Bond Connect is a new mutual market access scheme that allows investors from mainland China and overseas to trade in each other's bond markets through connection between the related mainland and Hong Kong SAR financial infrastructure institutions.

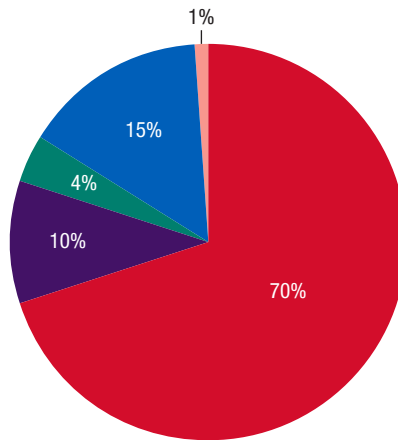
Figure 4.1. Outstanding Debt Securities of Nonfinancial Corporations
(Trillions of US dollars)



Sources: Bank for International Settlements 2017.
Note: Data are as of the third quarter of 2017.

Figure 4.2. Nonfinancial Corporation Financing, by Type, 2017

■ Loan ■ Bond ■ Equity ■ Shadow banking ■ Other



Source: People's Bank of China 2017.

underlying risks, leading to inefficient credit allocation and large contingent government liabilities. Access to the credit bond market remains quite restrictive, with issuance dominated by SOEs, while private firms have very limited access.

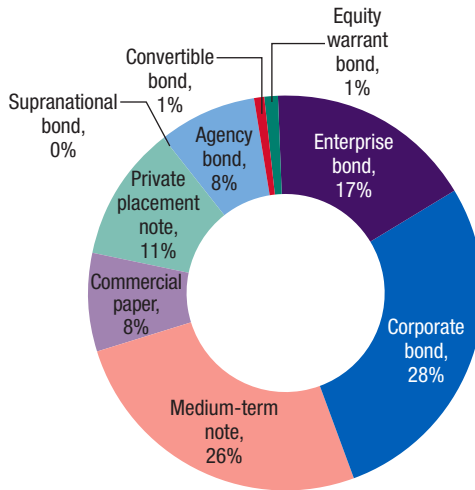
This chapter studies these issues in detail, in particular, how the current credit bond market is structured, how liquidity risks and credit risks are priced for different credit bonds, and what role implicit government guarantees play in bond pricing. The rest of the chapter first discusses the regulatory structure and characteristics of the various credit bond segments then analyzes empirically the pricing behavior of different types of credit bonds, and tests the impact of implicit guarantees on bond pricing.

MARKET STRUCTURE AND CHARACTERISTICS

China's credit bond market is highly diverse, with many different market segments.² Enterprise bonds, corporate bonds, and medium-term notes and commercial paper account for the lion's share (Figure 4.3). Nonfinancial firms can in principle freely choose any type of bond as a financing tool, but for historical reasons, SOEs typically dominate enterprise bond issuance, while private firms normally issue corporate bonds or medium-term notes or commercial paper.

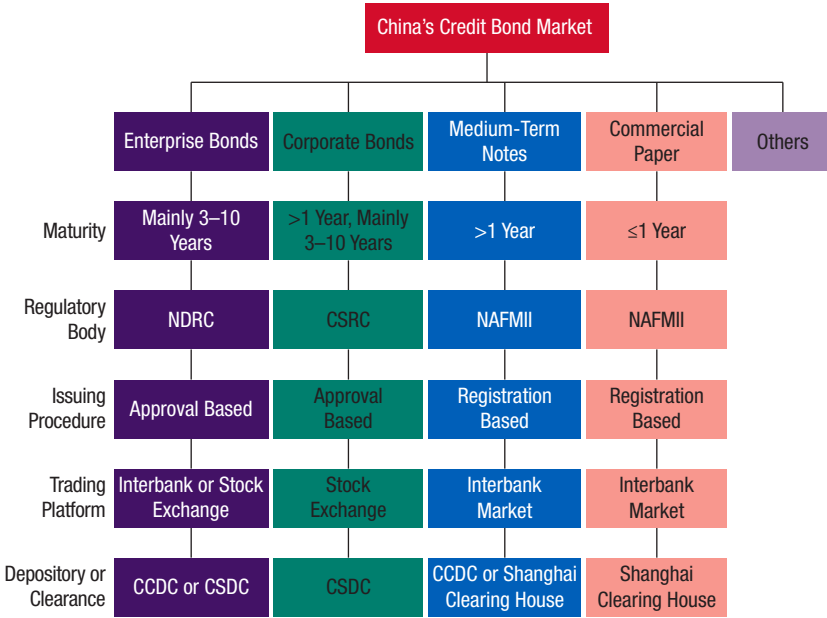
Credit bond regulation differs across agencies. Unlike in the United States, where the Securities and Exchange Commission is the sole regulator, credit bonds in China are regulated by different regulatory agencies, subject to different issuance procedures, and traded and settled on different platforms (Figure 4.4). Among the three main types of credit bonds, enterprise bonds are regulated by

Figure 4.3. Composition of the Credit Bond Market, 2017



Source: WIND Economic Database (www.wind.com.cn) 2017.

² This chapter focuses only on credit bonds issued by nonfinancial firms.

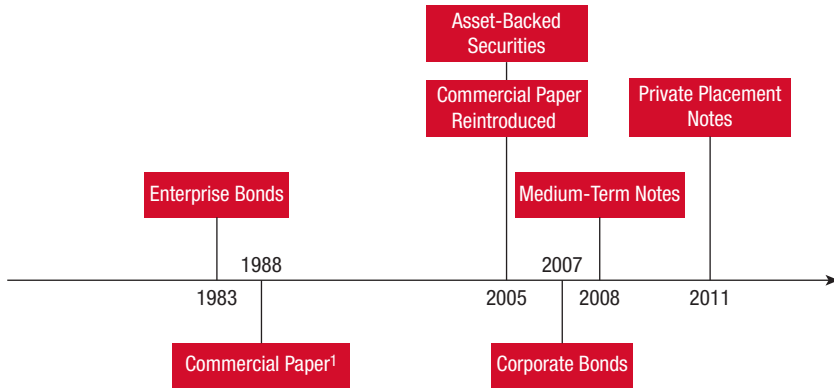
Figure 4.4. Segmented Bond Market Regulation

Source: Authors' compilation.

Note: CCDC = China Central Depository and Clearing Corporation Limited; CSDC = China Securities Depository and Clearing Corporation Limited; CSRC = China Securities Regulatory Commission; NAFMII = National Association of Financial Market Institutional Investors; NDRC = National Development and Reform Commission.

the National Development and Reform Commission according to the Corporate Law, the Securities Law, and Guidance on Enterprise Bond Management, and traded on both the interbank market and the exchange market. Corporate bonds are regulated by the China Securities Regulatory Commission according to the Securities Law and the Guideline on Corporate Issuance and Trading, and traded only on the exchange market. Medium-term notes and commercial paper are regulated by the National Association of Financial Market Institutional Investors under the People's Bank of China, based on the Guideline on Interbank Bond Market Nonfinancial Firms Financial Tools, and traded only on the interbank market.

In terms of issuance procedures, medium-term notes and commercial paper are registration based, while the issuance of enterprise bonds still requires approval. For corporate bonds, issuance to the general public requires approval, while private placement is registration based. All credit bonds (excluding private placement) require minimum ratings, such as AA or A–, or in some cases AAA. For

Figure 4.5. Development of Credit Bond, 1983–2017

Source: Authors' compilation.

¹Commercial paper was suspended in 1997.

firms with a leverage ratio exceeding a certain threshold, a compulsory external guarantee is required, in addition to the minimum ratings requirement.³

The existence of similar credit bond markets reflects China's unique historical development of credit bonds (Figure 4.5), which is closely related to the country's broader reform and policies to open its markets.

The development of China's credit bond market has proceeded in three stages:

- *First stage—enterprise bonds:* For a long period, enterprise bonds were the only type of credit bonds in China. They were first issued in 1983 and corresponding formal regulation was introduced in 1987 by the State Council. Overall, the guiding principle for enterprise bonds is to channel low-cost funding to weak links in the economy and achieve the goals of the national development strategy. Historically, enterprise bonds have been designed to provide financing for key national infrastructure projects, such as the Three Gorges Hydraulic Project, the national railway construction project, the construction and reengineering of the national electrical grid, and the development of the steel, chemical engineering, energy, and other industries. Over time, as China's development strategy has evolved, enterprise bonds have also expanded to finance such areas as green development, social housing, poverty reduction, and social services for seniors.

Initially, enterprise bonds were jointly regulated by the People's Bank of China and the National Development and Reform Commission (NDRC). At the end of the 1990s, purview shifted solely to the NDRC. Each bond

³ For example, for enterprise bond issuance, a compulsory explicit guarantee is required for issuers with debt-to-assets ratios of 75 percent or above, except for AAA issuers with ratios below 85 percent and AA+ issuers with ratios below 80 percent. The outstanding medium-term notes cannot exceed 40 percent of a firm's net assets.

issuance is typically earmarked for a project. The NDRC is in charge of both project approval and monitoring, and the corresponding bond issuance. With the reform in recent years, firms now have more flexibility in the bond issuance schedule within the quota that has been granted. For historical reasons, enterprise bond issuance is almost entirely by SOEs, both at the central and local levels. Bonds issued by LGFVs (so-called *chengtou zhai*), now account for 80 percent of enterprise bonds. By 2017, enterprise bonds accounted for 17 percent of outstanding credit bonds.

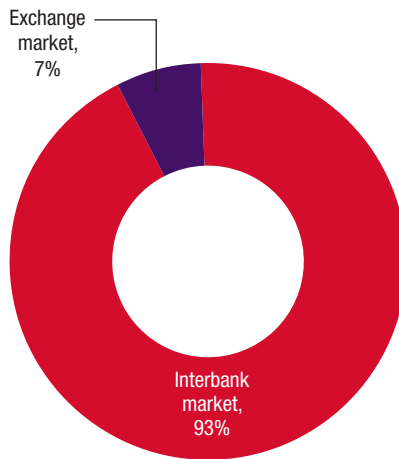
- *Second stage—corporate bonds:* Since 2004, the pace of capital market liberation has quickened, which has led to the introduction of new financial products, including bonds issued by financial institutions (so-called financial bonds) and asset-backed securities. In 2007, corporate bonds were launched, regulated by the China Securities Regulatory Commission and traded solely on the exchange market. Initially, the issuance was restricted to listed companies. Later, the regulator streamlined approval and filing procedures for exchange membership, and established a private placement system for nonlisted companies in 2015, which has spurred the rapid growth of this segment of the market. The panda bond, a renminbi-denominated bond issued by offshore companies, was also introduced to the exchange bond market in 2016. By 2017, outstanding corporate bonds were worth \$600 billion, accounting for 25 percent of the entire credit bond market.
- *Third stage—medium-term notes and commercial paper:* To further promote the ability of companies to raise financing directly, commercial paper was reintroduced in 2005, and a new type of credit bond, medium-term notes, was launched in 2008. Both commercial paper and medium-term notes are formally classified as nonfinancial-firm debt financing instruments,⁴ regulated by the National Association of Financial Market Institutional Investors (which is legally part of the People's Bank of China) and traded on the interbank market. Medium-term notes are the first type of credit bonds that can be issued on a registration basis, instead of after formal approval by the respective regulators. By 2017, the outstanding stock was \$600 billion, accounting for another 26 percent of total credit bonds outstanding. Commercial paper with tenors of 3, 6, 9, or 12 months reached \$50 billion, about 8 percent of total credit bonds.

Trading

The trading platform, meanwhile, has shifted from the exchange market to the interbank bond market. In 1997, about 98 percent of credit bonds were traded on the exchange market. This percentage declined significantly to 7 percent by

⁴ In addition to commercial paper and medium-term notes, nonfinancial-firm financing instruments also include asset-backed notes and private placement notes.

Figure 4.6. Credit Bond Trading, by Market, 2017



Source: WIND Economic Database (www.wind.com.cn) 2017.

2017, while the remaining 93 percent of transactions are traded in the interbank market (Figure 4.6).⁵

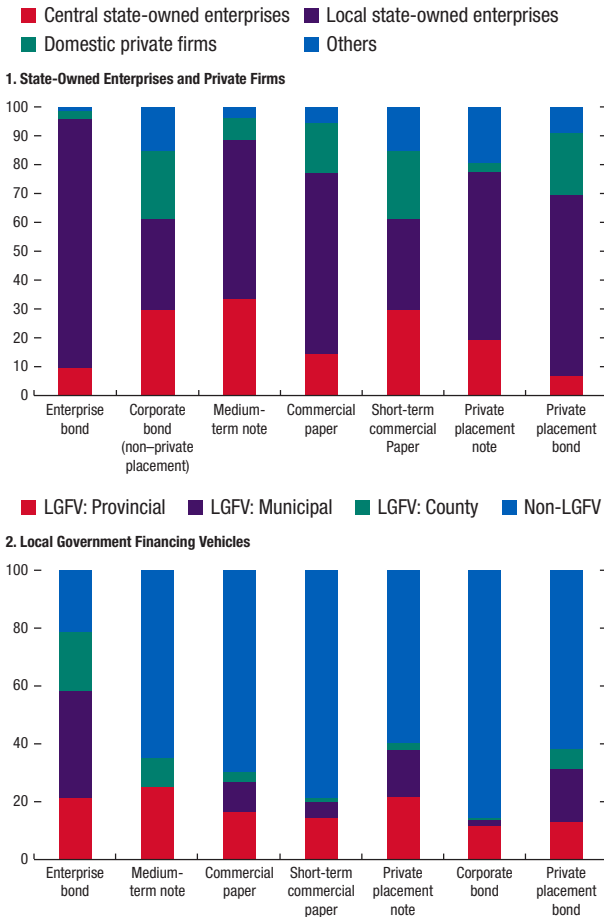
The current trading structure is in line with international experience, which shows that 90 percent of bond transactions typically take place outside the exchange market, that is, over the counter. It is notable that over-the-counter bond transactions in China take place in the interbank bond market, which typically provides funding only for banks in other countries. The interbank market is a wholesale market dominated by large institutional investors, where transactions are based on bilateral negotiations and the main settlement method is real-time gross settlement. The exchange market, on the other hand, is more of a retail market dominated by smaller institutional investors, such as securities firms, funds, and high-net-worth individuals. The transactions on the exchange are often settled on a net basis.

Issues

Credit bond issuance has been dominated by SOEs (Figure 4.7, panel 1). While the role of SOEs in China has declined significantly—in the past two decades, the share in employment fell below 15 percent and the share in industrial sales below 20 percent—SOEs still account for a disproportionately large share of credit, in both the banking system and the bond market (Lam and Schipke 2017). In

⁵ In addition, less than 0.3 percent of transactions take place in the commercial bank over-the-counter market and the free trade zone bond market.

Figure 4.7. Issuer Ownership Structure, by Bond Type, 2017
(Percent)



Source: WIND Economic Database (www.wind.com.cn) 2017.

Note: LGFV = local government financing vehicle.

2017, SOEs accounted for 40 percent of outstanding bank loans, and 80 percent of outstanding credit bonds were issued by SOEs, particularly local SOEs, with variation across different bond types. For example, enterprise bonds are almost exclusively issued by SOEs, while the share of private firm issuance is close to 40 percent of corporate bonds and short commercial paper.

For enterprise bonds, LGFVs account for 80 percent of total issuance (Figure 4.7, panel 2). Given that these firms are often used to finance the off-budget spending of local governments, such as infrastructure investment, LGFV borrowings are classified as augmented government debt in the IMF

definition (IMF 2018).⁶ Bonds issued by LGFVs often enjoy pricing advantages because they are generally considered to be backed by government guarantee. While the government has issued a number of regulations to break the implicit guarantees, the perception continues to be held by many market participants (see Chapter 11).

Investors

Credit bonds are almost entirely held by domestic investors. Reflecting various capital account restrictions, foreign participation in the credit bond market remains negligible, at 1 percent. Among domestic investors (Table 4.1), collective investment vehicles account for about 60 percent, followed by banks and securities firms. Reflecting the different trading platforms, securities firms have a higher participation rate in the corporate bond market (traded on exchanges) compared to other bonds that are mainly traded in the interbank market. Participation of long-term investors, such as pension and insurance funds, at 5 percent to 7 percent, is likewise limited.

Liquidity

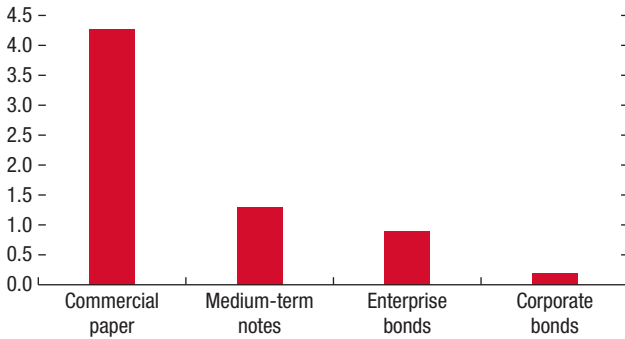
Credit bond liquidity varies across different bond types, but is generally low. Liquidity is typically higher for shorter maturities, in particular commercial paper (partly reflecting maturities shorter than one year) and is also higher for bonds traded on the interbank market than those traded on the exchange market (Figure 4.8). For example, enterprise bonds, despite long maturities of 7–10 years, have higher liquidity than corporate bonds with shorter maturities. This is because the interbank market has attracted large institutional investors that contribute to more liquidity, while investors in the exchange market often use corporate bonds as a tool for liquidity management, with transactions dominated by

TABLE 4.1.

Credit Bond Domestic Investor Base, 2016 (Percent)			
Investor Base	Corporate Bonds	Enterprise Bonds	Medium-Term Notes
Collective investment vehicles	64	62	62
Banks	18	29	31
Securities firms	12	3	2
Insurance	7	5	5
Clearing house	0	1	0
Nonbank financial institutions	0	1	0

Source: Authors' compilation.

⁶ In the 2014 national audit, the Chinese government officially acknowledged about 13 trillion renminbi in LGFV debt as government debt and since then has implemented various measures to break the link between LGFVs and government debt.

Figure 4.8. Annual Turnover Ratio, 2017

Source: Bloomberg L.P. 2017.

collateralized repurchase agreements (repos).⁷ Overall, the liquidity of credit bonds in China is much lower than in advanced economies because most investors tend to hold paper until maturity.

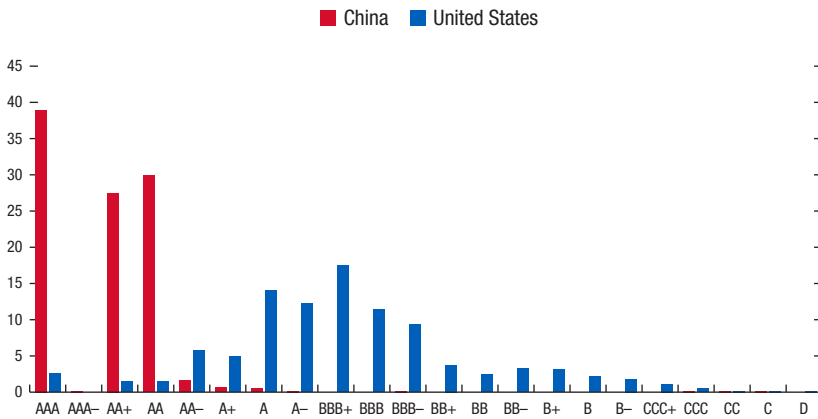
Ratings

Bond ratings in China are highly skewed, reflecting both stringent issuance requirements and implicit guarantees. More than 95 percent of credit bonds are rated AA and above, compared to less than 6 percent in the United States (Figure 4.9). This partly reflects the stringent issuance requirements. For example, among corporate bonds, only bonds with AAA rating can be issued to all investors; for medium-term notes and commercial paper, only bonds with AA rating or above can be issued; for enterprise bonds, as noted, a compulsory external guarantee is required for firms with a leverage ratio above a certain threshold. This means that access to China's credit bond market is quite restrictive and only firms with better quality can issue. At the same time, given the dominance of SOEs and the widespread market perception of government guarantees, the actual rating may overstate a firm's underlying financial health. The implicit rating by China Bond, a central depository platform, shows that about 40 percent to 50 percent of credit bonds are rated AA and above, in contrast to the 80 percent in the official ratings (Figure 4.10).

However, credit spreads in China are much higher for a given rating than in other countries. While the distribution of official ratings appears to be distorted, a closer look suggests that the same rating in China is associated with much higher credit spreads. For example, the credit spread of AAA bonds is typically 50 basis points in the United States and 87 basis points in China; for AA bonds, the credit spread is 175–220 basis points in China compared to only 70 basis points in the

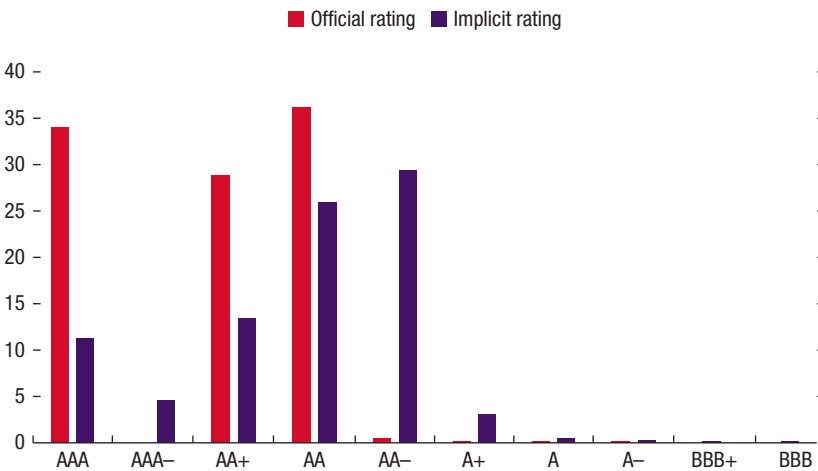
⁷ In this case, corporate bonds are used as collateral for repo transactions.

Figure 4.9. Credit Bond Ratings Distribution: China and the United States, 2017
(Percent)



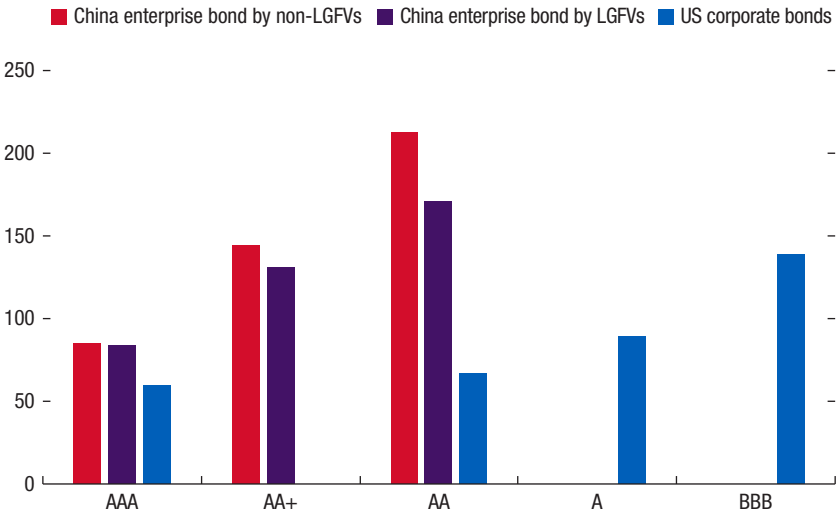
Source: Bloomberg L.P. 2017.

Figure 4.10. Official and Implicit Rating Distribution of Credit Bonds, 2017
(Percent)



Source: WIND Economic Database (www.wind.com.cn) 2017.

Figure 4.11. Credit Spreads, by Rating, China and the United States, 2017
(Basis points)



Source: WIND Economic Database (www.wind.com.cn) 2017.

Note: LGFV = local government financing vehicle.

United States.⁸ Hence, a highly condensed rating distribution disguises the large variation of underlying credit spreads (Figure 4.11).

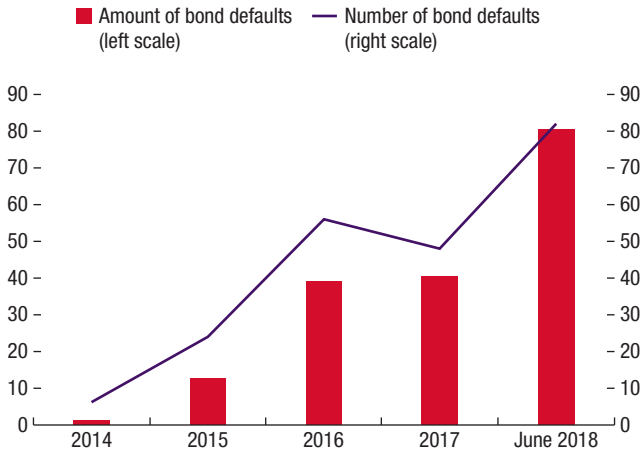
Defaults

Credit bond defaults are a more recent phenomenon in China, and overall default rates remain low. Indeed, from the first issuance of credit bonds in 1983, almost no defaults occurred in China until 2014, when the economy slowed down visibly (Figure 4.12). The low default rate can be attributed to strong economic fundamentals and strict issuance approval, but also government protection of investors in near-default cases. From 2014, when the economy entered a structural slowdown, to 2016, the default rate rose from 0 percent to 0.5 percent—still significantly lower than the global average of 2 percent. In 2017, the rate fell to 0.2 percent as the economy entered a cyclical rebound (Figure 4.13).

Proper risk pricing of credit bonds is key to the efficient allocation of resources. As credit bonds become an increasingly important venue for the financing of firms, adequate risk pricing is critical to ensuring that credit resources are allocated efficiently, which affects the overall efficiency of the

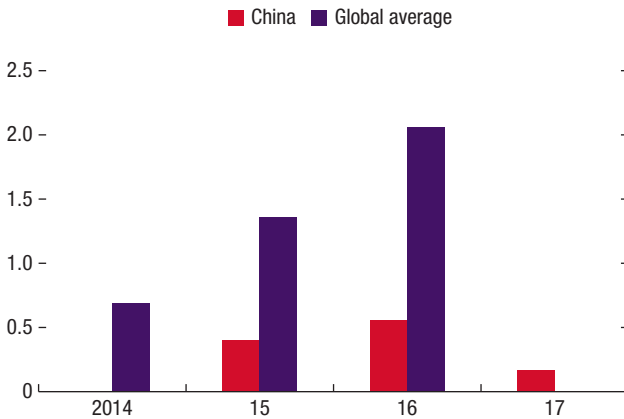
⁸ The high-yield AA bond in China, however, still has a lower spread than the high-yield bond in the United States, which has not dropped below 300 basis points since 2007.

Figure 4.12. Credit Bond Defaults, 2014–18
(Billions of renminbi, left scale; number of bonds, right scale)



Source: WIND Economic Database (www.wind.com.cn).

Figure 4.13. Credit Bond Default Rate in China and Globally, 2014–17
(Percent)



Sources: Brilliance Rating; and S&P Global.

economy. Implicit guarantees, in particular of SOEs, may significantly distort risk pricing and be detrimental to the long-term development of the credit bond market. The next section addresses the extent to which credit bond prices reflect underlying risks.

EMPIRICAL ANALYSIS

This section uses firm-level data to examine the pricing behavior of credit bonds in China. In particular, it analyzes the extent to which liquidity risk, credit risk, and the benchmark risk-free rate are reflected in bond prices and whether implicit guarantees have contributed to lower bond yields for SOEs and LGFVs.

In addition, given the segmentation of the bond market, it tests how pricing behavior differs across different credit bonds. Reflecting data restrictions, the analysis focuses on corporate and enterprise bonds that are traded on the exchange market. Medium-term notes and commercial paper are exclusively traded in the interbank market, and hence access to firm-level financial information is limited.

The literature on credit bond pricing in China is scant; the most recent study analyzes data up to 2012 (GAO and ZOU 2015) and hence does not capture the significant structural changes since then. In terms of methodology, considering the less-developed nature of the credit bond market in China, this chapter follows the linear approach used in GAO and ZOU (2015), and extends the analysis to bond market data until 2017.⁹ In comparison with Gao and Zhou (2015), one important deviation in the regression setup is that the analysis does not include credit ratings together with other firms' fundamentals as explanatory variables, which may create collinearity issues. Another contribution to the literature is to quantify the impact of implicit guarantees on bond pricing.

The model is specified as follows, where the credit bond yield is regressed on the benchmark yield and a set of risk factors, while controlling for fixed effects.

$$\text{Bond yield}_{it} = \beta_0^* \text{Guokai yield}_{it} + \sum_{j=1}^k \beta_j^* \text{factor}_{it}^j + \alpha + u_i + \varepsilon_{it}.$$

The explanatory variables include the benchmark rate (*Guokai yield*) and risk factors (*factor*) (see annex 4.1 for detailed summary statistics on regression variables). In particular,

- *Benchmark rate*: The analysis uses either the Treasury bond yield or the yield of the China Development Bank bond of the same maturity as the benchmark rate.¹⁰ The empirical results are robust to both specifications. While most studies use credit spread (bond yield minus benchmark) directly as the dependent variable, given the incomplete transmission in China, this

⁹ The literature is rich in structural models for credit pricing, including the Merton model, the Black and Cox model, the Collin-Dufresne model, and the Longstaff-Schwartz model. However, these models are not ideal for empirical testing of credit pricing (Merton 1974; Eom, Helwege, and HUANG 2004; Li and Wong 2008). The reduced form model (Jarrow and Turnbull 1995) is an alternative method, but the estimation is not robust (Duffee 1999) and often has a high estimation error similar to structural models (Gündüz and Uhrig-Homburg 2014). The linear model can easily include credit, liquidity, and systematic risk in bond pricing analysis and has been widely used empirically in recent studies (GAO and ZOU 2015).

¹⁰ The China Development Bank bond yield is the de facto benchmark rate in China's credit bond market, given its sovereign-grade ratings and much higher liquidity than the sovereign bond.

chapter uses the benchmark rate as an explanatory variable to test the degree of transmission from the risk-free rate to the credit price.

- *Credit risk factors:* A few variables are used to measure the credit risk of the issuer, including the size of total assets, interest coverage ratio, leverage ratio, and profit. The analysis also controls for ownership and firm type to test implicit guarantees for SOEs and LGFVs. Given that enterprise bonds are exclusively issued by SOEs, only data on corporate bonds (about 40 percent are issued by private firms) are used to test the pricing of implicit guarantees for SOEs.
- *Liquidity risk factors:* The analysis uses the Amihud ratio,¹¹ trading volume, and days to maturity to measure bond liquidity.
- *Systemic risk factors:* Overall stock market return and year dummy are used to control for systemic macro risks.

Reflecting data availability, the analysis looks at enterprise and corporate bonds traded on the exchange market from 2011 to 2017, including monthly trading data for 2,319 enterprise bonds and 1,467 corporate bonds. It then matches them with the financial data of bond issuers, which are interpolated to monthly frequency from quarterly data, including leverage ratio, interest coverage ratio, asset size, and profit. A few clean-up steps were performed to drop missing values and extreme values, and to ensure minimum trading of each bond during the sample period. The final sample includes 318 enterprise bonds and 265 corporate bonds. (Annex 4.2 explains the data clean-up process and presents details about the calculations.)

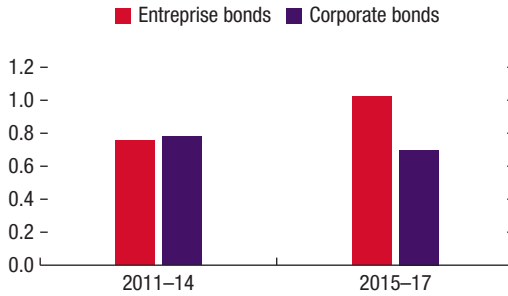
Pricing in Different Markets

Transmission from the risk-free rate to credit bond yield has improved for enterprise bonds, but remains incomplete for corporate bonds. In the sample from 2011–14, while about 80 percent of adjustment in the risk-free rate was transmitted to both enterprise and corporate bond yields, in more recent years, the transmission mechanism has strengthened notably for enterprise bonds, with almost one-to-one pass-through. For corporate bonds, transmission remains partial, at close to 80 percent (Figure 4.14). This likely reflects the fact that most government and enterprise bond trading takes place in the interbank market, with significant overlap of the investor base contributing to better pass-through. Investors on the exchange market are typically smaller institutions with limited exposure to government bonds, and are hence less sensitive to benchmark rate changes. Lack of liquidity for corporate bonds has also contributed to the partial pass-through from the benchmark rate.

Corporate bonds have better pricing of credit risks than enterprise bonds, while neither are price sensitive to liquidity risks (Figure 4.15). The regression

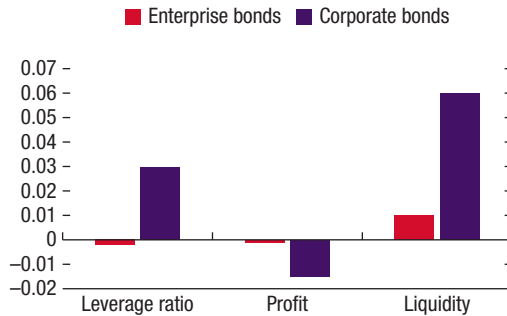
¹¹ The Amihud ratio is calculated as monthly return divided by monthly trading volume. The higher the ratio, the lower the liquidity.

Figure 4.14. Response of Credit Bond Yield to Benchmark Rate, 2011–14 and 2015–17
(Transmission ratio)



Source: Authors' estimates.

Figure 4.15. Bond Pricing of Credit and Liquidity Risks
(Percentage points)



Source: Authors' estimates.

analysis shows that, for corporate bonds, a 1 percentage point increase in leverage pushes yields 3 basis points higher, and a 1 percentage point increase in profitability reduces bond yields by close to 2 basis points. For enterprise bonds, however, both leverage and profitability have negligible impacts on bond pricing. This likely reflects that most enterprise bond issuers are LGFVs and are closely linked to the government, implying that investors value the implicit guarantee more than the firm's economic performance. In addition, external guarantees are often required for enterprise bond issuance for highly leveraged firms, which also contributes to the price insensitivity.

It is interesting that for both types of bonds, higher bond liquidity does not lead to lower yields. For corporate bonds, higher liquidity is even associated with higher spreads. This likely reflects the fact that most investors will hold the bond

until maturity or use it for collateralized repos, and hence have less demand for trading and high liquidity.

Implicit Guarantees

The regression results show that the implicit guarantee of SOEs and LGFVs typically reduces bond yields by 100 basis points. After controlling for the type of credit bond, industry, and trading year, this analysis finds that SOEs pay 108 basis points less in yield than private firms with the same financial conditions (including leverage, profitability, and size). Similarly, the analysis finds that LGFVs enjoy a 97 basis point reduction in bond yields, reflecting the perceived guarantee from the government.

In the subsample, the analysis does not find significant reduction in the pricing of implicit guarantees. This shows that despite the implementation of the new budget law in 2015, investors still perceive LGFVs as closely connected to local governments and enjoying implicit guarantees. Such a perception has contributed to a crowding out of credit resources for private companies and lower credit efficiency.

POLICY RECOMMENDATIONS

China's credit bond market is still at an early stage of development and has significant room to grow. To foster a better allocation of resources and hence overall economic development, the bond market would benefit from the following:

- *Harmonize the regulation concerning different credit bond schemes.* For historical reasons, China's credit bond market is segmented, with different regulators, issuance procedures, trading platforms, and depositories. Harmonizing the regulation of the different bond schemes would be an important step forward to reduce segmentation and regulatory arbitrage, increase liquidity, and foster price discovery. It would also increase the attractiveness for foreign investors. Recently, the government established an interministerial committee led by the People's Bank of China to work on unifying regulations. In September 2017, the regulations for rating agencies in the interbank market and exchange market were unified, which is a significant step and will pave the way for further harmonization in bond regulation.
- *Remove the implicit guarantee of SOEs and LGFVs.* SOEs dominate China's overall credit bond issuance, and on average pay 100 basis points less in bond yields than private firms with similar financial conditions, reflecting the implicit guarantees associated with SOEs. Investors still perceive LGFVs as having implicit guarantees, despite regulatory tightening. Such pricing distortions crowd out dynamic private issuers and lead to inefficient allocation of credit resources, while creating contingent government liabilities down the road. To break the implicit guarantee, the government should

allow the exit of weak SOEs and LGFVs, instead of stepping in with last-minute government support. In the meantime, such removal must proceed at a managed pace because a sudden break of implicit guarantees may lead to dramatic asset repricing and financial stability risks.

- *Broaden the investor base.* The credit bond market is dominated by domestic investors and needs to open up to attract foreign institutional investors. A more diversified investor base could promote better risk pricing and contribute to higher liquidity in the bond market. Other measures with respect to market structure, including promoting the outright repo market and centralizing market making, will also help increase bond liquidity (see Chapter 12).
- *Align the rating system with global standards.* Current credit bond ratings appear to be distorted compared to international standards. This certainly reflects the stringent regulatory threshold, but also reflects a nascent rating industry, which needs further improvement to provide more informative ratings. Bringing in more foreign participation in the ratings industry could promote a better risk culture and improve the quality of bond ratings. The licensing of three international rating agencies in 2018 is an important step forward.
- *Promote better risk sharing between investors and bond issuers.* Standards to issue credit bonds in China are stringent and issuance often requires approval. This partly reflects the regulator's intention to protect investors from potential default. However, more than 99 percent of bond investors are professional institutional investors who should be able to bear a certain degree of default risk. Regulators may strike a better balance in risk sharing between investors and bond issuers by lowering the regulatory threshold for bond issuance and encouraging more issuance by smaller private firms, while allowing bonds to default and investors to bear the risks.

CONCLUSIONS

China's credit bond market has developed rapidly in the past decade and is now the second largest in the world. Nonetheless, bond financing still accounts for only 10 percent of nonfinancial corporate financing, compared to around 60 percent in the United States. In addition, foreign investors currently hold less than 1 percent of credit bonds. This implies significant room for further bond market development and increased foreign participation.

The current fragmented credit bond market structure is the result of the market's unique historical development. New bond schemes (such as corporate bonds and medium-term notes) were introduced and developed in parallel to old schemes (such as enterprise bonds), which to some extent reflects the difficulty of fully reforming the old scheme for historical reasons. Different segments of credit bonds are also associated with different regulators and different trading and settlement platforms. The market is dominated by SOEs and LGFVs, and issuance

is highly restricted. In terms of ratings, 90 percent of credit bonds are rated above AA.

Based on firm-level data, the empirical analysis in this chapter provides unique insights into China's credit bond markets. Credit risk, for example, is more adequately reflected in the pricing of corporate bonds compared to similar enterprise bonds. At the same time, there is little pricing sensitivity to liquidity risks. The analysis also reveals that SOEs and LGFVs benefit from lower financing costs, amounting to a reduction of some 100 basis points when compared to private firms with similar financial and operating conditions. This reduction reflects the existence of implicit guarantees.

To take advantage of the full potential of China's credit bond market and improve resource allocations, further reforms will be needed:

- First, there is significant room to unify issuance procedures and regulations across different credit bond schemes. Over a longer horizon, a discussion about the benefits and costs of unifying the different regulators might be warranted.
- Second, to foster a more efficient allocation of resources, it will be important to eliminate government guarantees. Measures put in place in 2017–18 to break the link between local governments and LGFVs are already an important step in this direction. However, to create a level playing field, it will also be important to allow nonperforming SOEs to exit the market and hence allow corporate bond defaults (see Chapter 11).
- Third, efforts are needed to broaden the investor base and to attract more institutional investors into the market, including further opening up to foreign investors.
- Fourth, the rating industry in China needs further development to align with global standards. The approval of foreign rating companies in 2018 to enter the market may play an important role in this regard. Following a strengthened credit culture, the government could consider lowering the entry threshold for bond issuance and give small and medium private firms more access to bond issuance, with higher yields that properly reflect their underlying risks.

With these reforms, the credit bond market could become a more important venue for corporate financing and promote economic growth by allocating credit resources efficiently.

ANNEX 4.1. REGRESSION VARIABLES

ANNEX TABLE 4.1.1.

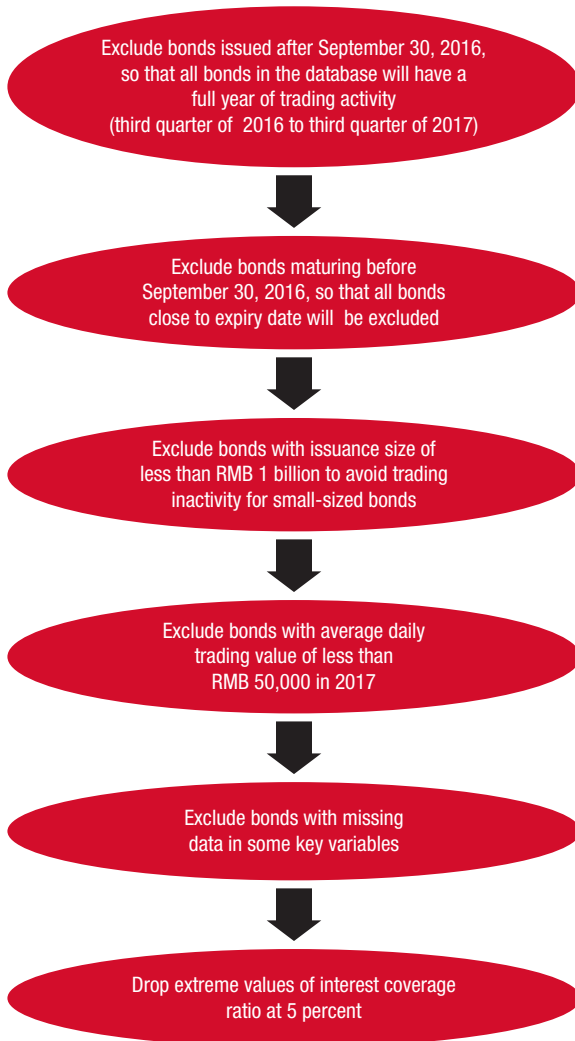
Regression Variables					
Characteristics	Type	Variables	Unit	Explanation	Expected Sign
Bond yield	Dependent variable	Bond yield	%	Monthly bond yields	
Baseline interest rate	Independent variable	Risk-free rate	%	China Development Bank bond yield with same maturity	Close to 1
Credit risk measurement	Independent variable	SOE	Dummy	SOE = 1, non-SOE = 0	-
	Independent variable	LGFV	Dummy	LGFV = 1, non-LGFV = 0	-
	Independent variable	Total asset	Log RMB million	Natural log of the total assets of the issuance company	-
	Independent variable	Profit	%	Net profit/revenue	-
	Independent variable	Interest coverage ratio	%	Interest coverage ratio	-
	Independent variable	Leverage ratio	%	Total Liability/Total Asset × 100%	+
Liquidity risk measurement	Independent variable	Illiquidity measure	%/RMB million	Amihud (2002), sum of monthly return/monthly trade dollar volume	+
	Independent variable	Trading volume	Log RMB million	Average daily trading volume	-
	Independent variable	Days left to maturity	Day	Maturity day-trading day	-
Bond specifics	Independent variable	Industry	Dummy	Different industries	
	Independent variable	Bond issuance length	Years	Bond issuance length	
	Independent variable	Issuance size	RMB 100 million	Bond issuance size	
Systematic risk measurement	Independent variable	Stock market change	%	China Securities Index 300 index change	-
	Independent variable	Trading year	Dummy	Year of the trading day	

Source: Authors' compilations.

Note: CSI = China Securities Index; ICR = interest coverage ratio; LGFV = local government financing vehicle; RMB = renminbi; SOE = state-owned enterprise.

ANNEX 4.2. DATA CLEANING AND SUMMARY STATISTICS

Annex Figure 4.2.1. Data Cleaning



Source: Authors' compilations.

Note: RMB = renminbi.

ANNEX TABLE 4.2.1.

Summary Statistics: Enterprise Bonds

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Bond yield	16,039	5.2	1.5	-13.7	14.6
Risk-free rate	28,107	4.2	0.7	2.6	6.4
LGFVs	28,454	0.8	0.4	0.0	1.0
Total assets	27,116	24.6	1.6	19.6	29.0
Profits	26,243	21.5	21.6	-7.1	78.7
Interest coverage ratio	23,564	16.1	31.6	0.8	130.6
Leverage ratio	27,116	52.0	16.6	0.3	95.2
Illiquidity measure	8,450	-0.4	8.2	-26.7	21.7
Trading volume	28,107	1.9	3.1	0.0	9.0
Days left to maturity	28,107	2,608	1,098	387	8,218
Bond issuance length	28,454	7.9	2.7	3	30
Issuance size	28,454	20.2	18.8	10	200
Stock market change	28,107	0.5	7.1	-21.0	25.8
Trading year	28,107	2014	1.95	2011	2017

Source: Authors' calculations.

Note: LGFV = local government financing vehicle.

ANNEX TABLE 4.2.2.

Summary Statistics: Corporate Bonds

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Bond yield	22,194	1.5	2.4	0.0	14.7
Risk-free rate	22,194	4.2	0.7	2.6	6.3
SOE dummy	22,468	0.5	0.5	0.0	1.0
Total assets	20,476	24.9	1.4	16.4	29.1
Profits	20,323	12.3	10.4	0.6	39.2
Interest coverage ratio	19,083	9.3	12.6	1.2	51.8
Leverage ratio	5,605	64.1	15.0	0.6	101.3
Illiquidity measure	4,713	0.0	0.0	-0.1	0.1
Trading volume	22,194	1.5	3.0	0.0	9.6
Days left to maturity	22,468	2,029	662	1,095	5,478
Bond issuance length	22,468	5.6	1.8	3	15
Issuance size	22,468	26.5	20.0	10.0	160.0
Stock market change	22,194	0.5	7.1	-21.0	25.8
Trading year	22,194	2014	1.95	2011	2017

Source: Authors' calculations.

Note: SOE = state-owned enterprise.

ANNEX 4.3. REGRESSION RESULTS

The following table presents the sensitivity of credit bond yields to the benchmark rate, credit risks, liquidity risks, and ownership characteristics. The pricing behavior is estimated separately for corporate bonds and enterprise bonds using both the ordinary least squares and fixed-effects methods.

ANNEX TABLE 4.3.1.

Sensitivity of Credit Bond Yields				
Variables	Enterprise Bonds		Corporate Bonds	
	Model (1a)	Model (1b)	Model (2a)	Model (2b)
	OLS	Fixed Effects	OLS	Fixed Effects
Risk-free rate (CDB bond yield)	0.797***	0.769***	0.714***	0.736***
LGFV dummy	-0.0334	-0.0333	-0.0645	-0.0612
	-0.968***			
	-0.233			
SOE dummy			-1.081***	
			-0.13	
Total assets	-0.304***	-0.164	-0.746***	-1.302***
	-0.0997	-0.241	-0.149	-0.31
ICR	0.00225	0.00243	0.00678**	0.00814***
	-0.00202	-0.00216	-0.00274	-0.0028
Leverage ratio (Debt/Assets)	-0.00235	-0.00423	0.0321***	0.0389***
	-0.00463	-0.00671	-0.01	-0.0128
Illiquidity measure (Amihud ratio)	-0.00951***	-0.00967***	-2.387***	-2.412***
	-0.00149	-0.0015	-0.417	-0.409
Profit (net profit margin)	-0.00151	-0.00156	-0.0145***	-0.0152***
	-0.00162	-0.00172	-0.00411	-0.00454
Trading volume	0.0129	0.00584	0.0640***	0.0624***
	-0.013	-0.0129	-0.0113	-0.0111
Days left to maturity (bond life)	0.000166**	0.000791***	-9.76E-05	-0.00027
	-8.22E-05	-0.000142	-0.000123	-0.000197
Issuance size	-0.00587		0.00668	
	-0.00486		-0.00595	
Bond maturity	-0.0821***		0.0527	
	-0.0208		-0.0467	
Stock market exchange	0.00263***	0.00389***	-0.00141	-0.00092
	-0.00097	-0.00098	-0.00111	-0.00112
Constant	10.87***	4.342	19.18***	32.78***
	-2.451	-6.028	-3.259	-7.595
Control for year	Yes	Yes	Yes	Yes
Control for industry	Yes		Yes	
No. of observations	7,402	7,402	4,313	4,313
R ²		0.559		0.493
No. of bonds	318	318	265	265

Source: Authors' calculations.

Note: CDB = China Development Bank; ICR = interest coverage ratio; LGFV = local government financing vehicle; OLS = ordinary least squares; SOE = state-owned enterprise.

*** $p < .01$; ** $p < .05$.

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Local Government Bonds

W. Raphael Lam and WANG Jingsen

China's government bond market has grown rapidly to become one of the largest in the world. Overall, China's fixed income market reached renminbi (RMB) 74.5 trillion in 2017 (over 90 percent of GDP, or US\$11 trillion), the third largest after the United States and Japan (Figure 5.1, panel 1). Local government bonds accounted for about 20 percent of China's fixed income market.

Much of the rapid growth has been driven by a debt-swap program and new issuance of local government bonds since late 2014. The central government has allowed local governments to issue bonds formally, subject to an annual cap, as part of efforts to rein in rising fiscal risks from local government off-budget borrowing. The stock of local government bonds reached RMB 15 trillion (nearly 20 percent of GDP) in 2017, exceeding the size of sovereign bonds (Figure 5.1, panel 2).

Before 2015, local government bond financing was negligible because of central government restrictions, although local governments have played a key role in regional development and social services.¹ Moreover, local governments in general face structural revenue shortfalls relative to their spending needs. They have circumvented the rules by setting up local government financing vehicles (LGFVs) to borrow from banks and capital markets, leading to a buildup of LGFV bonds (so-called *chengtuo zhai*). Local governments have also relied on those LGFVs to engage in countercyclical fiscal policies, increasing investments at a time of economic slowdown (Mano and Stokoe 2017; LI and Mano, forthcoming).

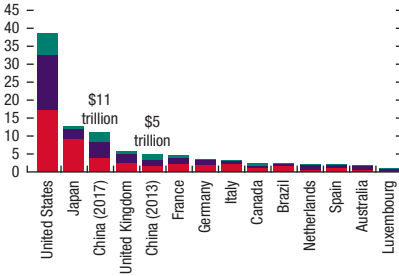
Despite its current size, the local government bond market remains underdeveloped. Banks hold most local government bonds, and trading is limited. Bond spreads suggest little credit risk differentiation partly because of the widely held view that local government bonds carry government backing (see Chapter 13 on implicit guarantees). Many local governments, particularly in

¹ China has four broad subnational government levels (provincial, prefectural, county, and township). Provincial government consists of 31 provinces, autonomous regions, and province-level municipalities. More than 3,000 prefectural and county-level governments undertake most public services. Prefectures and counties are often densely populated, ranging from 150,000 to 2 million residents.

Figure 5.1. Recent Developments in China's Bond Markets

■ General government ■ Financial institutions ■ Nonfinancial corporations

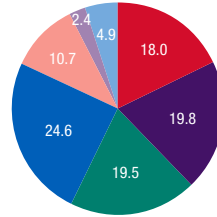
1. International Comparison of Fixed Income Markets, End of September 2017¹
(Debt securities outstanding as of the end of September 2017, trillions of US dollars)



Source: Bank for International Settlements.
 Note:
¹China's share in 2013 is added for comparison.

■ Sovereign bonds ■ Local government bonds ■ Corporate bonds¹
 ■ Financial institution bonds ■ Asset-backed securities
 ■ Interbank negotiable certificates of deposit ■ Others

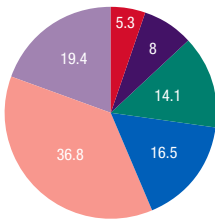
2. Growing Importance of Local Government Bond Markets, Year-End 2017
(Percent of total outstanding amount as of year-end 2017)



Sources: Ministry of Finance; WIND Economic Database (www.wind.com.cn); and authors' estimates.
 Note:
¹Includes bills and notes, and local government financing vehicle bonds not classified as government debt.

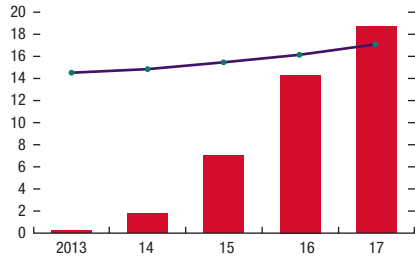
■ Social housing ■ Environmental protection
 ■ Transportation and infrastructure ■ Land development
 ■ Municipal construction ■ Others

3. Use of Government Debt, by Selected Provinces, 2015
(Percent of local government debt)



Sources: Local government in Jaingsu province; and WIND Economic Database (www.wind.com.cn).

4. Government Bonds Outstanding, 2013-17
(Percent of GDP)



Sources: Ministry of Finance; authors' estimates.

underdeveloped regions, continue to face structural deficits—higher spending needs than revenues—even with bond financing.

This chapter discusses recent developments in the local government bond market and how these compare to other countries. It looks at current impediments to market development and reviews policy options, including fiscal reforms, to develop a sound local government bond market.

RECENT DEVELOPMENTS

The local government bond market was negligible before mid-2014 because most borrowing was through off-budget financing vehicles. Local governments were prohibited by law from borrowing on their own before 2014, except under the five-year pilot bond issuance program that started in 2009. Under the program, the Ministry of Finance issued RMB 200 billion in local government bonds on behalf of local governments. The central government later allowed a small set of provincial governments to issue bonds directly (about RMB 3 billion to RMB 4 billion as of the end of 2014). Local governments used other sources of financing for development needs and as a countercyclical fiscal tool to achieve growth targets. They relied on land sale proceeds and established LGFVs to borrow from banks and capital markets in ways to circumvent legal restrictions.² In contrast to the small outstanding amount of local government bonds before 2014, LGFV bonds rose rapidly starting in 2010, contributing to significant fiscal risks (IMF 2015).

The buildup of fiscal risks in local government finance has prompted central government measures to impose stricter control. The revised budget law adopted a strategy of “opening the front door and closing the back door,” allowing provincial governments to issue their own bonds subject to an annual cap determined by the National People’s Congress, while tightening local government off-budget borrowing and other unregulated sources.³ At the same time, the central government recognized about 22 percent of GDP of LGFV debt as general government debt in 2014–15. A three-year bond-swap program (of RMB 18 trillion, or 25 percent of 2015 GDP) was also launched to gradually replace high-interest and short-duration debt (including bank loans, LGFV bonds, trusts, and other nonstandard borrowing) with provincial government bonds with maturities of 2 years to 20 years (Table 5.1).

The local government bond market grew from RMB 1.1 trillion to RMB 14.7 trillion between 2014 and 2017. The rapid buildup of debt has contributed to the deterioration of the net financial worth of local governments (Lam and Moreno-Badia, forthcoming; IMF 2018a). Much of this growth was due to the debt-swap program. About 90 percent of official local government debt is now in the form of debt securities (Table 5.1). Overall, this program has helped local governments extend debt maturities, reduce interest costs, and standardize local government debt instruments (Lam, WEI, and van Eden 2017), but could have crowded out private investment (HUANG, Pagano, and Panizza 2016). While

² Those LGFVs are distinct entities owned by local governments, typically established for land development, infrastructure investment, and social housing. The rise of infrastructure spending after the global financial crisis was mostly financed through such off-budget financing. LGFVs are legally registered as corporations and have public sector objectives, which contrast with state-owned enterprises that run primarily on a commercial basis. In most cases, local governments have shared the LGFVs’ responsibilities to service debt and have provided debt guarantees.

³ The National People’s Congress authorized an issuance of RMB 1.6 trillion in bonds in 2015, of which RMB 600 billion was for new financing and another RMB 1 trillion was for refinancing maturing LGFV debt deemed general government debt under a three-year debt-swap program.

TABLE 5.1.

Government Debt and Bond Issuance, 2013–17					
<i>(Trillions of renminbi; percent)</i>					
	2013	2014	2015	2016	2017
Government Debt Outstanding	9.5	25.0	25.5	27.3	29.9
<i>(Percent of GDP)</i>	16.0	38.8	36.9	36.7	37.7
of which: central government	8.7	9.6	10.7	12.0	13.5
of which: local governments	0.9	15.4	14.8	15.3	16.5
<i>(Percent of GDP)</i>	1.45	23.9	21.5	20.6	20.9
<i>Debt-swap program (flow)</i> ¹	-	-	3.2	4.9	2.8
New bond issuance ²	3.0	4.0	0.6	1.2	1.6
Local government bond outstanding	0.8	1.1	4.8	10.6	14.7
<i>(Percent of official local government debt)</i>		7.1	32.6	69.3	89.5
Government Debt Ceiling ³	-	25.5	26.9	29.8	33.0
Central government	-	10.1	11.2	12.6	14.1
Local government	-	15.4	15.7	17.2	18.8

Sources: Ministry of Finance; and WIND Economic Database (www.wind.com.cn).

Note: Italicized values indicate percent of GDP, otherwise in renminbi.

¹ The debt-swap program will end by October 2018.

² These amounts include the local government bond pilot program between 2009 and 2014.

³ The government debt ceiling was approved by the National People's Congress.

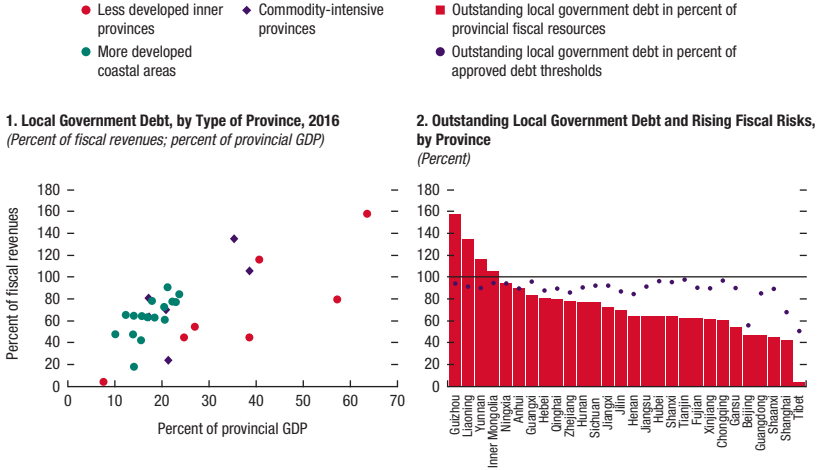
the debt-swap program ended in October 2018, further expansion of local government bonds is likely, given local governments' sizable financing needs.

The issuance of local government bonds varies significantly across provinces, but does not fully reflect the fiscal fundamentals of local governments (Figure 5.2). The more developed coastal provinces, nominally, have the largest bond issuance, but their debt burdens in terms of percent of GDP are smaller than the less-developed provinces. The less-developed provinces have debt of more than 40 percent of GDP, on average, and more than 80 percent of provincial fiscal resources. The weighted average yields on local government bonds reached 4.3 percent in 2017 (about 140 basis points below the average bank lending rate), and spreads across provinces were minimal—within 10–20 basis points—much smaller than the spreads of subnational government bonds issued in other countries (Sola and Palomba 2015). The credit ratings of local government bonds are not differentiated among provinces, with most issuance receiving triple AAA– ratings.

Relative to member countries of the Organisation for Economic Co-operation and Development (OECD), the size of China's local government bond market is large with respect to public finances. Currently, about 37 of 53 major economies allow local governments to raise debt. Among OECD countries, subnational government debt accounted for 31 percent of GDP on average for federal countries and about 15 percent of GDP for unitary countries in 2010–15, comparable to the level of official local government bonds in China, at about 20 percent of GDP (Figure 5.3).

The small share of subnational government debt in OECD countries is due to legal restrictions on subnational borrowing and strict prudential fiscal rules defined by the central government. Local government borrowing in many

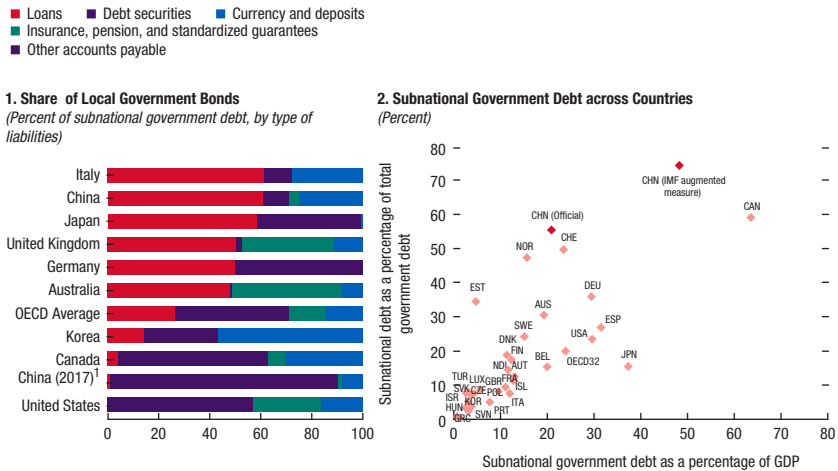
Figure 5.2. Local Government Debt across Provinces



Sources: Ministry of Finance; and authors' estimates.

Sources: Ministry of Finance; WIND Economic Database (www.wind.com.cn); and authors' estimates.

Figure 5.3. Subnational Government Debt, China versus OECD Countries



Sources: Ministry of Finance; National Audit Office; OECD 2016; and authors' estimates.

Note:

¹ Based on the official definition of general government debt.

Sources: Ministry of Finance; OECD; and authors' estimates.

Note: The panel uses three-letter International Organization for Standardization country codes. OECD32 = average of the 32 OECD member countries. CHN = China; OECD = Organisation for Economic Co-operation and Development.

countries can take place only for long-term investment in infrastructure. Debt securities account for a large share of subnational government debt across OECD countries (45 percent on weighted average), especially for states in federal countries (Figure 5.3).⁴ For example, in the United States in 2017, the amount outstanding of municipal bonds was about US\$3.8 trillion (10 percent of the total bond market, or 20 percent of GDP). In Japan in 2015, local government debt was about 30.4 percent of GDP (17 percent of total government bonds) (Ministry of Internal Affairs and Communications 2017).

China's government has also rolled out measures to further develop local government bond markets (opening the front door), alongside measures to tighten off-budget local government borrowing (closing the back door) (Table 5.2):

- The revised budget law and related directives have assigned fiscal responsibility for local government finances to provinces. Provincial finance bureaus are responsible for lower-level subnational finances. If fiscal risks rise above a certain threshold, upper-level governments have the authority to restructure lower-level debt with creditors and hold officials accountable.
- An early-warning system and risk management guidelines were announced to monitor subnational fiscal risks. Those measures, though untested, aim to warn of fiscal risks and allow for an early resolution of fiscal challenges, while limiting spillover to other subnational governments. Measures include a loss of fiscal authority for local administrations, while ensuring the local populace retains minimum service levels.
- New directives allow local governments to issue bonds against land development and income from toll roads. Cross-agency measures were introduced to raise policy coordination and effectiveness.

OVERCOMING OBSTACLES

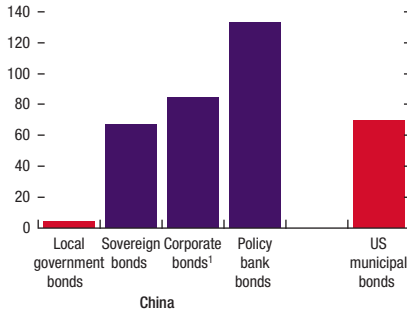
The surge in local government bond issuance has not been matched by a corresponding upgrade in bond market development and regulatory measures. Long-existing impediments, such as limited liquidity, a narrow investor base, weak credit structure, lack of disclosure, fragmented regulations, and limited debt management capacity have become more challenging and complex in a growing market. These impediments are intertwined and reinforce one another. Some are also common in other parts of the capital market (such as sovereign and corporate bonds):

- *Limited liquidity*: Despite growth in secondary market trades—almost entirely in the interbank market—which rose to more than RMB 250 billion in 2017, liquidity in the local government bond market is still very low.

⁴ A federal system shares power between the federal government and the states or provinces (Canada, Germany, the United States). A unitary system of government (or unitary state) is a sovereign state governed as a single entity; the central government delegates different degrees of powers to the administrative divisions (China, Japan, Korea, Sweden, the United Kingdom).

Figure 5.4. Impediments in the Local Government Bond Market

1. Limited Liquidity in the Local Government Bond Market
(Total annual turnover in percent of outstanding amount across fixed income instruments)

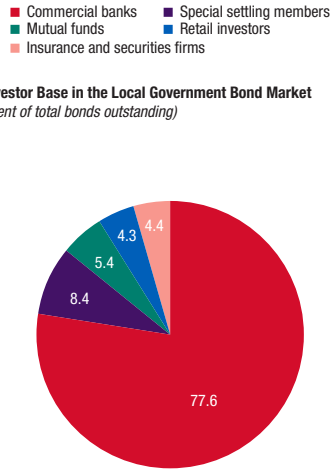


Sources: Ministry of Finance; WIND Economic Database (www.wind.com.cn); and authors' estimates.

Note:

¹ Includes corporate and enterprise bonds, bills, and notes.

2. Investor Base in the Local Government Bond Market
(Percent of total bonds outstanding)



Sources: Ministry of Finance; WIND Economic Database (www.wind.com.cn); and authors' estimates.

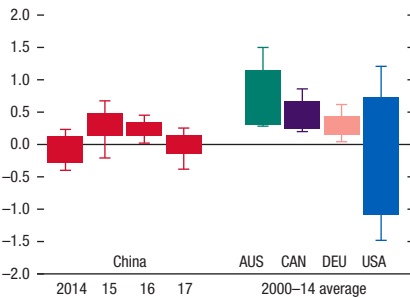
3. Primary Market Bond Yields
(Percentage points)



Sources: WIND Economic Database (www.wind.com.cn); and authors' estimates.

Note: M = month.

4. Subnational Government Bond Spreads
(Percent over sovereign yields)



Sources: Sola and Palomba 2015; and WIND Economic Database (www.wind.com.cn).

Note: AUS = Austria; CAN = Canada; DEU = Germany; USA = United States.

Average turnover was only 4.3 percent of the outstanding amount, much lower than 66 percent for sovereign bonds in 2017 (Figure 5.4, panel 1).⁵

⁵ While sovereign bonds have been issued, spanning from 3-month to 50-year maturities, and the futures markets at 5- to 10-year Treasury bonds have supported liquidity, overall secondary market activity remains thin.

TABLE 5.2

Key Government Measures to Regulate Local Government Finances, 1994–2018

Date of Announcement	Document Reference	Key Measures
Mar. 1994	Article 28 of the previous budget law	The budget law prohibited local governments from borrowing and issuing bonds, which had been in force until 2009.
2009	State Council	The State Council approved the issuance of RMB 200 billion in local government bonds.
2011	<i>CaiKu</i> 2011 No. 141	The State Council introduced a pilot program to allow the Ministry of Finance to issue bonds on behalf of selected local governments.
2013–14	<i>CaiKu</i> 2013 No. 77; <i>CaiKu</i> 2014 No. 57	The pilot program was expanded to other provinces and municipalities with various maturities. Credit ratings were required at issuance.
Aug. 2014	Revised budget law	Effective from 2015, the revised budget law stipulated that provincial governments can only borrow in the form of bond financing, subject to a debt quota imposed by the State Council. Local governments had the full obligation to repay and monitor the risks and were prohibited from providing other forms of guarantees to third parties.
Oct. 2014	<i>Guo Fa</i> 2014 No. 43	Provincial governments were granted the authority to issue bonds, subject to the approval of the corresponding provincial People's Congress. The measure also standardized the debt financing mechanism, separated local government financing vehicle debt from government obligations, intensified the accountability and monitoring of local government contingent liabilities, and encouraged the use of public-private partnerships (PPPs).
May 2015	<i>State Council Doc</i> No. 40; <i>CaiKu</i> 2015 No. 64; <i>CaiYu</i> 2015 No. 32; <i>CaiKuai</i> 2015 No. 83	Interim measures were introduced to smooth local government financing for ongoing projects. Further regulations were put in place to regulate the use of funding and the repayment responsibility for local government bonds.
	<i>CaiKu</i> 2015 No. 102	Cross-agencies jointly announced a debt-swap program to replace local government debt, such as bank loans, with local government bonds over a three-year period. The annual swap program would be announced during the annual session of the National People's Congress.
Jul. 2016	<i>CaiYu</i> 2016 No. 154 and No. 155	Further regulations were issued on local government debt, including greater scrutiny of budget management, debt servicing, and use of funds from bond financing.
Oct. 2016	<i>State Council Doc</i> . No. 88	The State Council issued directives for the risk management and resolution framework for local government debt. Provincial governments were tasked with monitoring the local government debt and taking measures to mitigate risks.
May 2017	<i>CaiYu</i> 2017 No. 50	Cross-agencies established a joint mechanism to monitor local government debt risks, reiterated the ban on off-budget local government borrowing, improved disclosure, and tightened local government financing vehicle and PPP financing.

(continued)

TABLE 5.2 (continued)

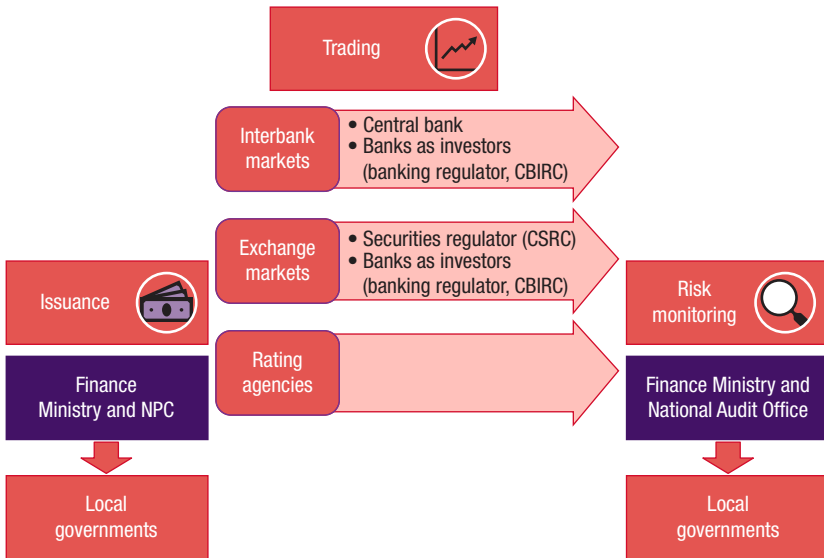
Key Government Measures to Regulate Local Government Finances, 1994–2018		
Date of Announcement	Document Reference	Key Measures
May 2017	<i>CaiYu</i> 2017 No. 62, 87, 89, 97	These measures barred local government from raising debt illegally through the service procurement process and banned the “build-transfer” mechanism; local governments were allowed to issue special bonds based on land reserves, subject to tighter regulations. Toll road special bonds were formally allowed, subject to a debt ceiling and disclosure on the budget. Repayment will be based on land development and toll income.
Jun. 2017 and Nov. 2017	<i>CaiJin</i> 2017 No. 55., No. 455; and <i>CaiBanJin</i> 2017 No. 92	The government prohibited certain infrastructure projects from adopting PPP models and allowed certain projects to be securitized. It also required local governments to file PPP projects in the centralized database, while clearing out all that did not meet the criteria.
Mar. 2018	<i>CaiJin</i> 2018 No. 23, <i>CaiYu</i> No. 28	State-owned financial institutions were prohibited to finance local governments except through local government bonds and seek local government guarantees. The central government allowed the local government special bond issuance to finance social housing (Shantytown Renovation) projects.
May 2018	<i>CaiKu</i> 2018 No. 61	The central government introduced measures to coordinate local government bond issuance across provinces, including setting a quarterly limit of bond issuance (not exceeding 30 percent of the annual limit), requiring local governments to use market pricing when issuing bonds, and expanding maturity to 2, 15, and 20 years.
Dec. 2018	<i>CaiYu</i> 2018 No. 209	The Ministry of Finance issued guidelines to strengthen the disclosure of local government debt.

Sources: Ministry of Finance; State Council; and media reports.

Low liquidity is even more pronounced when compared to other public sector issuers, such as policy banks’ debt instruments. Liquidity has been low partly due to underdeveloped financial market infrastructure such as market-making dealers, and limited incentives for trading due to tax exemptions on coupon payments only for bonds held to maturity (see Chapter 3 on sovereign yield curves and Chapter 11 on liquidity conditions and market structure).⁶ Low liquidity has also contributed to a narrow investor base as investors are less willing to invest when it is difficult to resell bonds.

⁶ Low liquidity has also reduced the role of price referencing typically provided by government securities. As a result, sovereign bonds in China do not provide a liquid benchmark yield curve. Initially under the bond-swap program, banks bought the local government bonds at a low coupon rate. Banks could suffer a mark-to-market loss if bonds are sold.

Figure 5.5. The Fragmented Regulatory Framework for the Local Government Bond Market



Source: National authorities.

Note: CBIRC = China Banking and Insurance Regulatory Commission; CSRC = China Securities Regulatory Commission; NPC = National People's Congress.

- *A narrow investor base:* More than three-quarters of local government bonds are held by commercial banks, due to low liquidity and the legacy from the debt-swap program (Figure 5.4, panel 2). A key constraint in local government bond development is the lack of a diversified institutional investor base. Long-term institutional investors, such as mutual funds, life insurance companies, and pension funds, are the natural holders of long-horizon local government bonds, but these investors are largely absent in the market. In addition, foreign ownership of domestic local government bonds is very low (at 5 percent of total sovereign bonds, and almost nil for local government bond markets), though it is expected to rise when Chinese debt securities are included in global benchmark indices and as China continues to open up its domestic financial market.
- *Underdeveloped credit risk culture and its distortions of local government bonds:* Credit ratings do not seem to differentiate sufficiently among provinces, with most local governments receiving a AAA rating independent of their growth prospects, debt ratios, and fiscal fundamentals. Other nonmarket elements could exist in the pricing of local government bonds, including a case in which local governments might exert pricing powers with their large deposits at commercial banks. In addition, although provincial governments

have full, explicit responsibility for all subnational government debts according to the budget law, existing laws do not allow defaults by provincial governments. The perception is widespread that the central government will bail out any local government debt nonpayment or defaults (JI and others 2017). So far, there have not been any provincial local government defaults (IMF 2018b). Such defaults are often perceived to have negative repercussions for bond market development, including moral hazard and distorting risk pricing (see Chapter 12 on implicit guarantees).

- *Lack of disclosure:* Investors and rating agencies often have limited information with which to assess local government creditworthiness. Although the Ministry of Finance has repeatedly requested the disclosure of subnational debt management and fiscal data ahead of bond issuance, many local governments fail to disclose or provide only limited information. For example, the prospectus for China's local government bond issuance is typically only 8–10 pages, compared to over 300 pages for municipal bond issuance in the United States.
- *Fragmented tax and regulatory frameworks:* Several ministries and agencies regulate and supervise the local government bond market, each handling different aspects (Figure 5.5).⁷ Multiple agencies supervising different aspects are common across countries, but China is characterized by both overlapping responsibilities (bond trading) and regulatory gaps (such as disclosures and resolution). Local government bonds are traded on both the over-the-counter interbank and exchange markets. This coexistence of two main market segments does not pose a problem per se, but current restrictions have segmented investor participation across markets and bond instruments, which creates room for pricing distortion and affects trading in different platforms (for example, similar instruments have a pricing gap of 10–20 basis points) (see Chapter 4 on credit bonds).
- *Limited debt management capacity:* While provincial governments have had the authority to issue bonds since 2015, it is not surprising that their debt management capacity is still developing. The capacity for risk monitoring varies across provinces, and is relatively weak in lower-level finance bureaus, below the provincial levels, and in provinces outside the 2009–14 pilot program (mostly less-developed regions). In that context, the Ministry of Finance has helped raise capacity at local levels by establishing local government debt units. While the Ministry of Finance provides broad guidelines

⁷ For example, the Ministry of Finance and local finance bureaus are responsible for the overall fiscal envelope in bond issuance, while the central bank is responsible for trading in the interbank markets, and the securities regulator, the China Securities Regulatory Commission, is responsible for activity in the exchange markets. Given large holdings of local government bonds in commercial banks, the banking and insurance regulator, China Banking and Insurance Regulatory Commission, also plays a role in local government bonds when it supervises banks' capital risk weighting and portfolio holdings. The National Development and Reform Commission is responsible for the special construction bonds used for local government capital projects.

and coordination (such as coordinating issuance schedules to avoid crowding across provinces), those efforts might not always be aligned with the financing needs of provinces. The lack of a medium-term budget framework increases uncertainty about the bond quota for local governments in coming years, making debt management more challenging in the face of long-term infrastructure projects.

In other countries that allow local governments to issue bonds, separate specialized debt management units (at both the central and subnational levels) are often established to manage subnational debt (World Bank 2001). For example, the Municipal Securities Rulemaking Board in the United States is tasked with managing municipal debt issuance, while the US Securities and Exchange Commission is responsible for ex post supervision of registration-based municipal issuance and setting disclosure requirements. In the United Kingdom, the Debt Management Office oversees bond issuance for sovereign and local government debt issuance.

DEVELOPING A SOUND LOCAL GOVERNMENT BOND MARKET

Developing a sound government bond market will be increasingly important for subnational government financing and capital market development. Addressing impediments in the bond market will require significant upgrades to financial market infrastructure related to the issuance, trading, and resolution of defaults on local government debt securities, as well as more harmonized regulation and supervision to address regulatory gaps. In many cases, the measures will also contribute to the development of the overall capital market, not only the local government bond market, in parallel, advancing fiscal reforms to resolve intergovernmental structural imbalances and tightening imprudent off-budget borrowing by local governments. The following are key areas for development:

Financial Market Infrastructure

Strengthening market infrastructure will be critical to improve the functioning of local government bond markets. For example, primary dealers and market-making arrangements can prioritize the issuance of larger benchmark instruments (such as those in mid-horizon maturity) on local government bonds, which would help raise liquidity. In addition, formulating a resolution framework for local government bonds for missing repayment or defaults could assure potential investors. For example, in the United States, the resolution framework for subnational governments clearly defines the roles and responsibilities of various stakeholders and specifies the thresholds and conditions that would resolve defaults. For China, it will be important to clarify the trigger for intensified oversight and steps to resolve missing payments in the current framework (Lam, WEI, and van Eden 2017).

Bond Market Liquidity

Enhancing the liquidity of local government bonds will entail improving market-making and trading infrastructure arrangements and developing real-time trade data in secondary markets, allowing mark-to-market valuation.

Predictable, regular local government bond issuance will, over the medium term, lower interest costs to issuers. Local governments (possibly under a centralized system) can provide markets a tentative issuance calendar of local government bonds at regular intervals, at least quarterly, to guide market pricing and smooth interest costs over market cycles. The calendar can preannounce auctions weeks in advance (beyond the current five days) to provide time for banks to find nonbank investors. Standardizing terms for local government bonds in provinces (for example, the same date each month for maturing and interest payment) can enhance market predictability. For example, Yunnan and Guangdong provinces since October 2017 have made progress standardizing auctions, including settlement arrangement, transaction, and trust methods.

At the same time, the central government can lift arbitrary limits on bidding to encourage trading (currently subject to a threshold of issued maturity in the auction). Over time, when supervision improves, the central government may consider gradually giving provincial issuers greater discretion over the modalities of bond issuance (such as adjusting the amount and maturity to smooth debt service requirements and control refinancing risks).

Broadening the Investor Base

A wider investor base, particularly long-term investors such as life insurance companies and pension funds, would help accommodate the growing local bond market. In this area, progress has been made in opening up the domestic bond market to foreign qualified investors. For example, foreign institutional investors have been able to invest directly in the interbank bond market or through the Bond Connect program since 2017. This has widened the potential investor base of fixed income markets, including in the local government bond market.⁸ Accompanying revisions, including those to syndications and auction rules and of issuance and distribution, could support diversification of the investor base. Moreover, to reach a new set of investors, the list of authorized bidders in auctions for local government bonds could include broker-dealers, with the lead underwriters providing market making to raise liquidity.

⁸ For example, banks cannot trade bond futures and access the repurchase and block trading system of corporate bonds on the exchanges. Overseas investor access to the exchange bond market is limited to Qualified Foreign Institutional Investors and Renminbi Qualified Foreign Institutional Investors, while the interbank bond market has largely been opened up to nonresidents. Differential tax treatment on banks potentially reduces market liquidity.

Differentiating Credit Risks

The central government should provide clarity on the liability for local government borrowing, such as introducing non-bailout clauses through legislation, providing legal mechanisms for resolving local government defaults, and strengthening the mechanism for ex post monitoring of the uses of funds. This will involve measures beyond the current framework that assign full responsibility to provincial governments for local government bonds, and clarify what to do if provincial governments cannot meet their payments. The clarification would mitigate the entrenched perception that the central government will bail out local government in the event of default (GAO, RU, and TANG 2017). Over time, consideration can be given to gradually phasing out the current administrative caps on bond coupons so that pricing can rely more on market forces to guide issuance.

Regulation and Taxation

The harmonization of regulation could mitigate the segmentation of issuers and instruments in the interbank and exchange markets.⁹ Harmonizing regulation across multiple ministries and agencies will reduce regulatory gaps and ensure equitable access from issuers and investors. The authorities can clarify the respective roles and responsibilities of various stakeholders in the legislation to enhance fiscal coordination and promote transparency in local government bond issuance. There should also be a clear and explicit legal mandate for a financial oversight function of the central government, along with an enforcement regime to address noncompliance or violation of the rules and regulations. This requires policy coordination and information sharing, which are key aspects of regulating the local government bond market.

Fiscal Reforms

The resilience of local government bond markets is ultimately related to the underlying fundamentals of local government finances, which can be strengthened through the following:

- *Tightening new local government off-budget borrowing avenues:* Recent government regulations, such as prohibiting local government guarantees and ineligible public-private partnership projects, have contributed to the slower rise of off-budget investment spending (Table 5.3). Further efforts will involve a gradual but assertive reduction of off-budget borrowing in new avenues of government-guided funds and new forms of public corporations converted from LGFVs. The oversight of local government off-budget debt will therefore involve collecting data concerning these new avenues.

⁹ Financial and government bonds are rarely traded on the exchange; the exchange market has a sizable corporate bond market; and the interbank market has the most commercial paper and enterprise bonds.

- *Intergovernmental reforms*: Resolving the current misalignment of local government revenues and spending needs is critical to ensuring sound public finances and thereby supporting the development of local government bond markets. Recent measures toward realigning local government finances through a combination of raising the local government tax base and revenues, such as through the planned introduction of recurrent property taxes; increasing transfers from upper-level governments; and shifting a greater share of spending responsibility to the central government are welcome. The central government will need to decide on the degree of decentralization, accounting for other parallel structural reforms (such as eliminating residency-based restrictions on access to public services). The realignment should accelerate to mitigate local government financing needs and the incentives for circumventing existing regulations. Fiscal coordination based on a clear division of authority and responsibilities between central and local governments can promote more balanced regional development and raise the equity of basic public services across regions.
- *Debt management capacity and disclosures*: Improving disclosure includes more timely and comprehensive data on the financial balance sheets of subnational governments, their debt service obligations, and fiscal outlook, and full disclosure of fiscal risks and contingent liabilities. Building on the central government's commitment to compiling government balance sheets by 2020, the data compilation can be aligned closely with the International Monetary Fund's *Government Finance Statistics Manual*. This approach would provide a more accurate measure of the impact of fiscal policy.

CONCLUSIONS

The local government bond market has grown rapidly and is becoming a key part of China's capital markets. Despite the rapid growth in size, the bond market is still underdeveloped. Severe impediments for local government bond markets—low liquidity, a weak credit culture, a narrow investor base, and a fragmented regulatory structure—exist and become more visible in a growing market.

Developing sound government bond markets will be increasingly important for subnational government financing and capital market development. Addressing impediments in the bond markets requires significant upgrades in the financial market infrastructure related to the issuance, trading, and resolution of defaults on local government debt securities, as well as more harmonized regulation and supervision across ministries and agencies to address existing regulatory gaps.

A broad range of policy prescriptions is needed to improve local government bond markets. In many cases, the measures will also contribute to overall capital market development, not only the local government bond market. In parallel, advancing fiscal reforms can help resolve intergovernmental structural imbalances and tighten imprudent off-budget borrowing by local governments.

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Treasury Futures

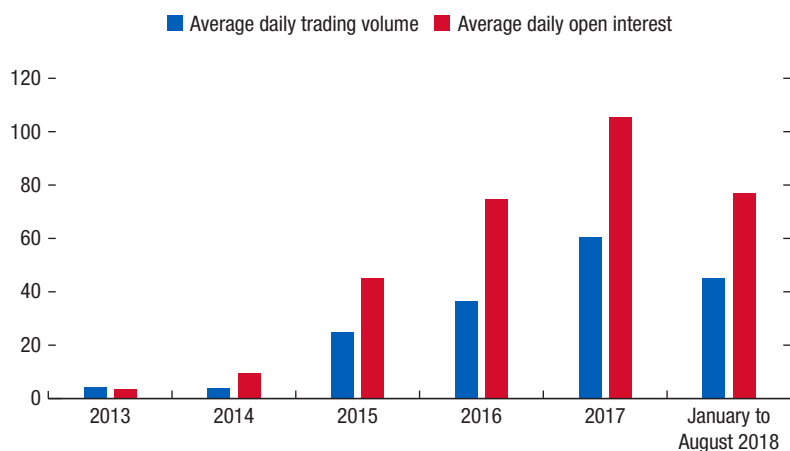
FANG Xinghai

Since its launch in 2013, China's Treasury bond futures market has grown steadily, and the delivery process has been smooth and orderly. The futures market, closely linked to the Treasury cash market, has been providing well-functioning risk management tools for investors, and institutional participation has increased. Indeed, despite its short five-year history, the Treasury futures market has already begun to facilitate development of the cash market by enhancing liquidity, improving the efficiency of price discovery, and enabling investors to better manage interest rate risks. Nonetheless, the market needs to further diversify product offerings, improve investor composition, and provide market access to foreign investors and alternative trading mechanisms.

OVERVIEW

The China Financial Futures Exchange launched 5-year Treasury bond futures in September 2013, 10-year Treasury bond futures in March 2015, and 2-year Treasury bond futures in August 2018, providing diversified tools for managing interest rate risks. All three products are physically settled, and each has a set of bonds (a basket) used for settlement with specified coupon rates and deliverable maturities. The deliverable bonds for 5-year Treasury bond futures are book-entry interest-bearing Treasury bonds with an original maturity of no more than 7 years and a remaining maturity of 4 years to 5.25 years upon the first day of the expiry month. Ten-year Treasury bond futures have an original maturity of no more than 10 years and a remaining maturity of no less than 6.5 years upon the first day of the expiry month. Two-year Treasury bond futures have an original maturity of no more than 5 years and a remaining maturity of 1.5 years to 2.25 years upon the first day of the expiry month (see Annex 6.1).

Figure 6.1. Treasury Futures Trading Volume and Open Interest, 2013–18
(Number of contracts, thousands)



Source: China Financial Futures Exchange.

Trading Volume and Open Interest

Starting with limited activity, the Treasury futures market picked up momentum in September 2014, with open interest¹ surpassing 10,000 contracts for the first time. It went on to exceed 100,000 contracts in December 2016 and peaked at 147,446 contracts in October 2017 (Figure 6.1). As of August 31, 2018, open interest stood at 73,828 contracts, amounting to 22.8 times open interest contracts at the end of 2013. Meanwhile, average daily trading volume increased from 4,326 contracts in 2013 to 37,828 contracts in the first eight months of 2018. Throughout this period, the ratio of annual trading volume to open interest remained around 0.5.

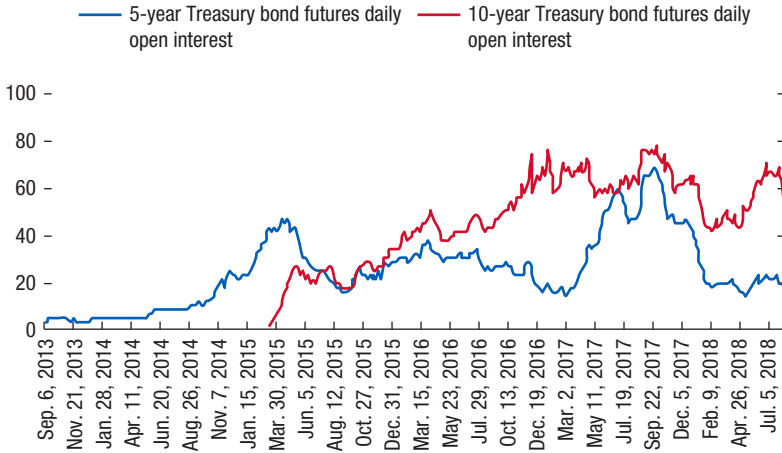
Globally, 10-year Treasury yields are regarded as the most representative rate and 10-year futures are therefore most commonly used worldwide. China is no exception. Its 10-year Treasury bond futures gained traction and became the flagship product in January 2016. By August 31, 2018, open interest was 53,294 contracts, or 72.2 percent of the market total (Figure 6.2). In the first eight months of 2018, average daily open interest was 54,358 contracts, or 70.5 percent of the market total. Average daily trading volume in the same period was 36,740 contracts, or 81 percent of the total.

As a new product, 2-year Treasury bond futures have been gradually gaining traction since their launch on August 17, 2018. Within two weeks, average daily trading volume reached 1,504 contracts, and average daily open interest reached 3,394 contracts as of August 31, 2018.

¹ Open interest refers to the number of outstanding derivative contracts that have not been settled (also referred to as *open commitments/contracts*).

Figure 6.2. Five- and 10-Year Treasury Bond Futures Open Interest Contracts, 2013–18

(Number of contracts, thousands)



Source: China Financial Futures Exchange.

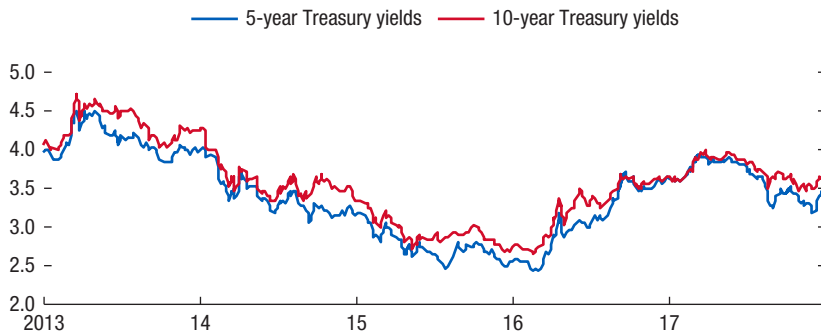
Historical Pricing

Price movements in Treasury futures have mirrored cash prices, with 99 percent correlation between the settlement price of the dominant contract and the price of the underlying bonds. Starting with the cash price, 10-year Treasury yield increased by 127 basis points, from 3.45 percent in June 2013 to 4.72 percent at the end of 2013. Yield then declined 205 basis points to 2.67 percent by October 10, 2016, followed by another uptick of 133 basis points to nearly 4 percent. In the first eight months of 2018, yield fluctuated within a moderate range (Figure 6.3).

After the launch of 5-year Treasury bond futures in September 2013, the settlement price of the dominant contract dropped concurrently with the cash price to RMB 91.32 in November 2013, down RMB 2.87 from the listing day. The price then picked up and peaked at RMB 102.115 on October 21, 2016, declined to RMB 95.605 in January 2018, and climbed amid fluctuations through the first eight months of 2018 to stand at RMB 98.000 on August 31 (Figure 6.4, panel 1).

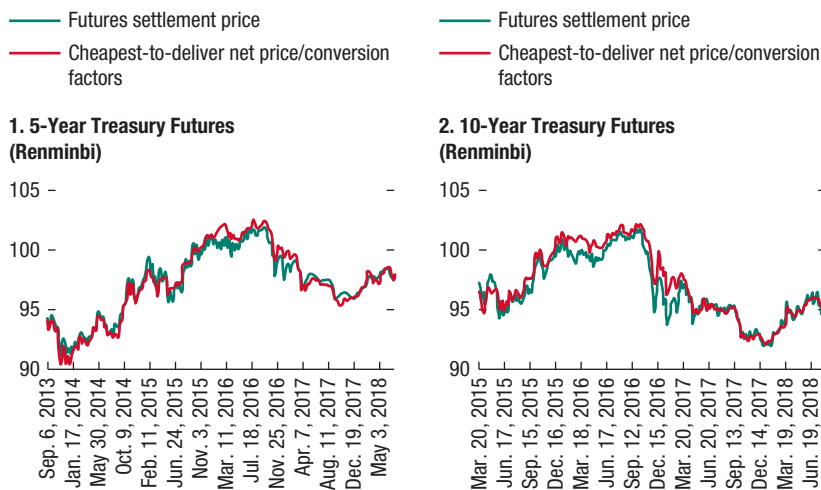
The settlement price of the 10-year dominant contract reached RMB 101.88 in October 2016, up RMB 7.69 from the listing day. The trend was then reversed, and the price fell 10.2 percent to a historical low of RMB 91.495 on January 19, 2018. In the first eight months of 2018, the futures price fluctuated between RMB 91.495 and RMB 96.330 (Figure 6.4, panel 2).

Figure 6.3. Historical Treasury Yields, 2013–17
(Percent)



Source: China Financial Futures Exchange.
Note: Data are for September 6 of each year.

Figure 6.4. Five- and 10-Year Treasury Futures and Cash Prices, 2013–18



Source: China Financial Futures Exchange.

Source: China Financial Futures Exchange.

The 2-year Treasury bond futures product was launched on August 17, 2018. The dominant contract opened at RMB 99.400 on the launch day and closed flat at RMB 99.375 on August 31. During the short span of two weeks following the product launch, the highest and lowest prices were, respectively, RMB 99.435 and RMB 99.075.

Futures Delivery

Physical delivery links the Treasury futures market with the cash market and underpins price convergence between the two. Given the large size and relatively low liquidity of China's Treasury bond market, certain mechanisms are in place to prevent futures delivery risks. First, Treasury futures are physically settled, and each contract has a delivery bond basket that defines specified coupon rates and deliverable maturities. Second, before mandatory delivery on the expiry day, sellers can opt for delivery in a voluntary delivery phase. Third, delivery-versus-payment was introduced in June 2017 to provide alternative delivery for eligible positions.²

With high institutional participation, the Treasury futures market has a low delivery rate. By August 31, 2018, a total of 22,771 lots were delivered on 31 contracts. The average delivery rate per contract was around 2.7 percent.³ For 5-year Treasury bond futures, 19 contracts were delivered with an average delivery amount of 673 lots per contract, with the largest amount delivered for a single contract consisting of 2,121 lots. For 10-year Treasury bond futures, 12 contracts were delivered with an average delivery amount per contract of 832 lots and the largest amount totaling 1,865 lots.

Investor Composition

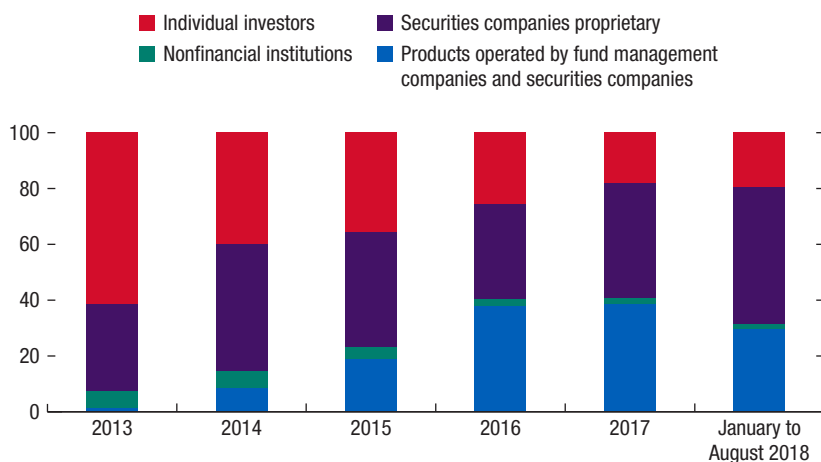
The majority of participants in the Treasury futures market are securities companies, mutual funds, registered private investment funds (hedge funds), products operated by fund management companies and securities companies, non-financial institutions, and individual investors. When Treasury futures were first launched, individual investors accounted for a larger share of both trading

² Two central depositories operate in China's Treasury bond market: the China Securities Depository and Clearing Corporation Limited and China Central Depository and Clearing Co., Ltd. For positions matched for delivery, if the seller and the buyer both declare that they will use China Central Depository and Clearing Co. accounts for delivering and receiving the bonds, such positions are then closed through delivery versus payment. Other positions are closed using the ordinary delivery method provided by the China Financial Futures Exchange. The procedure is as follows: The buyer and seller entering delivery are confirmed and matched on T day. Bonds for delivery are transferred from the seller's bond account to the exchange's bond account on $T+1$ day. The exchange then transfers payment from the buyer's margin account to the seller's margin account on $T+2$ day. Finally, on $T+3$ day, the exchange transfers the received bonds from its bond account to the buyer's bond account.

³ The delivery rate of a given contract is calculated using the following formula:

$$\text{Delivery rate} = \frac{\text{Total delivery amount of the contract}}{\text{Largest end-of-day open interest of the contract}}$$

Figure 6.5. Average Daily Open Interest, by Participant, 2013–18
(Percent)



Source: China Financial Futures Exchange.

volume and open interest. Later, as liquidity built up, institutional investors, particularly securities companies and asset managers, started to increase their activity and gradually became major participants in the market. By the end of August 2018, proprietary positions of securities companies accounted for 49 percent of the open interest and products operated by fund management companies and securities companies accounted for 30 percent, for a total of 79 percent (Figure 6.5).

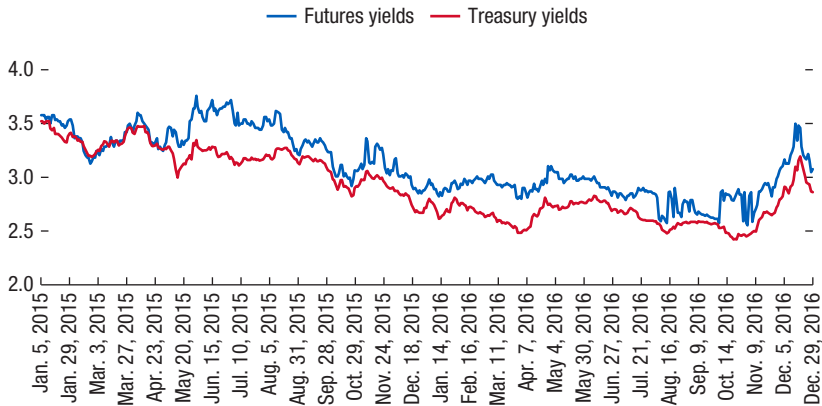
IMPROVING BOND MARKET PERFORMANCE

Treasury bond futures play a critical role in facilitating the high-quality growth of the bond market. In China, the Treasury futures market, despite its short history, as noted, has enhanced cash market liquidity, improved the efficiency of price discovery, enabled institutional investors to hedge interest rate risks, and facilitated issuance in the primary market.

Enhancing Cash Market Liquidity

Treasury futures greatly improve cash market liquidity. Since the launch of Treasury futures, Treasury bonds with the same maturity as the cheapest-to-deliver bonds have been the most actively traded. For instance, in the year after 5-year Treasury bond futures were launched (from September 2013 to September 2014), 7-year Treasury bonds were cheapest to deliver and had a trading volume 3.77

Figure 6.6. Five-Year Treasury Yields and Futures Yields, 2015–16
(Percent)



Sources: China Financial Futures Exchange; and WIND Economic Database (www.wind.com.cn).

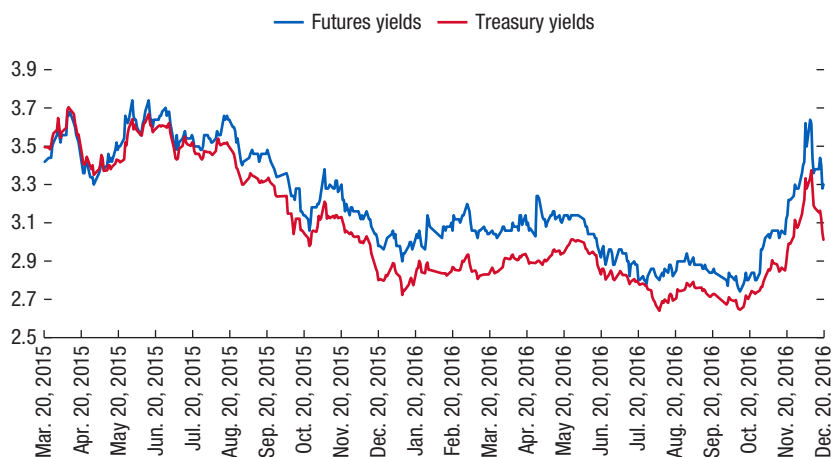
times that of 10 year Treasury bonds.⁴ By contrast, in the year after 10-year Treasury bond futures were launched (from March 2015 to March 2016), 10-year Treasury bonds became cheapest to deliver and trading volume of 7-year Treasury bonds dropped to only 44.1 percent of 10-year Treasury bonds.⁵

Two factors explain this enhanced liquidity. First, Treasury futures provide opportunities for cash-futures arbitrage. Empirical studies show that trading volume of the cash market is highly correlated with arbitrage activities. At present, the short selling of bonds is very hard in the Chinese market due to insufficient securities lending mechanisms. Therefore, most arbitrage activities fall into the cash-and-carry category (positive arbitrage). Second, with Treasury futures in place to manage inventory and liquidity risks, market makers have more incentive to provide continuous liquidity to the market. In China, market makers' use of Treasury futures has already led to positive results. During China's bond market swing at the end of 2016, market makers that had access to Treasury futures managed to maintain continuous quotes with bid-ask spreads stabilizing around RMB 0.30. In comparison, the bid-ask spreads of those that did not have access, such as commercial banks, widened significantly.

⁴ Both trading volumes are for 7-year and 10-year Treasury bonds issued and traded from September 6, 2013, to September 5, 2014.

⁵ Both trading volumes are for 7-year and 10-year Treasury bonds issued and traded from March 20, 2015, to March 19, 2016.

Figure 6.7. Ten-Year Treasury Yields and Futures Yields, 2015–16
(Percent)



Sources: China Financial Futures Exchange; and WIND Economic Database (www.wind.com.cn).

Improving Efficiency of Price Discovery

The over-the-counter bond market is characterized by low trading continuity and transparency, whereas the Treasury futures market is exchange traded with continuous and transparent transactions. As a result, the launch of Treasury futures greatly improves overall bond market transparency. Studies on cash-futures price relationships, both international and domestic, mostly conclude that Treasury futures improve the efficiency of price discovery.

In the Chinese market, yields on Treasury futures and Treasury yields are evidently correlated. Figures 6.6 and 6.7 show that for the dominant contracts of both 5-year and 10-year Treasury bond futures, movements in futures yields mirrored the yields of the underlying bonds. Correlation is 92.0 percent for the 5-year futures and 97.1 percent for the 10-year futures. Such a strong correlation improves price discovery in both the cash and the futures markets, as information leads to chain reactions among market participants. Though differences exist between cash and futures prices, the overall price movements are broadly the same.

To further test the cash-futures price relationship, this chapter uses an augmented Dickey-Fuller-tested 5-minute price series of Treasury futures and the underlying bonds as input for a Granger causality test. The test was carried out on the first difference of the cash/futures price series for both 5-year and 10-year Treasury bond futures. The P-value indicates that futures prices Granger-cause⁶ cash prices and vice versa (Table 6.1).

⁶ Granger causality is a statistical technique to determine whether a time series can be statistically predicted by the previous observations of another time series.

TABLE 6.1.

Granger Causality Test on Treasury Futures and Cash Prices		
Null Hypothesis	F Statistic	P Value
5-year Treasury bond futures do not Granger-cause the underlying bonds	7.67387	2.E-12
5-year Treasury bonds do not Granger-cause the futures	1.89139	0.0415
10-year Treasury bond futures do not Granger-cause the underlying bonds	4.72933	3.E-08
10-year Treasury bonds do not Granger-cause the futures	46.9287	8E-120

Source: WIND Economic Database (www.wind.com.cn).

Enabling Institutional Investors to Hedge Interest Rate Risks

The Treasury futures market is liquid and price movements thus are closely linked to those of the underlying bonds. Proper use of Treasury futures enables efficient duration adjustments so as to hedge interest rate risks (Table 6.2).

From a macro perspective, Treasury futures strengthen the resilience and stability of the cash market. In late 2016, China's bond market underwent a sizable adjustment. Institutional bondholders sold off bonds to stop losses, straining the liquidity of the cash market. Meanwhile, liquidity in the Treasury futures market remained abundant. Given such circumstances, investors shorted large quantities of Treasury futures to hedge risks. Futures trading volume and open interest increased dramatically as a result. Taking 10-year Treasury bond futures as an example, average daily trading volume reached 68,677 contracts in December compared with 19,504 contracts in October, while average daily open interest increased from 50,802 contracts to 61,666 contracts. Throughout the bond market swing, Treasury futures played a critical role in stabilizing the market by offering hedging tools and diverting sell-off pressure from the cash market.

From a micro perspective, Treasury futures enable financial institutions to hedge interest rate risks. For instance, Treasury bonds with the symbols of 130018, 140005, and 140006 were issued on August 28, 2013, March 26, 2014, and April 9, 2014, with coupon rates of 4.08 percent, 4.42 percent, and 4.33 percent, respectively. A large dealer held bonds with a total value of about RMB 600 million, and shorted Treasury futures to hedge downward price risks during the 2016 market swing. Similarly, in the fourth quarter of 2016, a mutual fund of nearly RMB 5 billion held a large quantity of sovereign and quasi-sovereign bonds. The fund shorted 450 lots of Treasury futures on a daily basis for hedging. Despite sharp fluctuations in the cash market, the net value of the fund remained stable and its accumulated returns even increased.

Facilitating Issuance in the Primary Market

Treasury futures provide important price reference and tools to hedge interest rate risks, facilitating institutional participation in the primary market. Following the launch of Treasury futures, the subscription to new Treasury bond issuance has increased (Table 6.3). In the three years before the launch of 5-year Treasury bond futures (September 6, 2010, to September 5, 2013), 5-year Treasury bonds were

TABLE 6.2.

Price Change of On-the-Run, Ultra-Long-Term Sovereign and Quasi-Sovereign Bonds during Market Fluctuations			
Bond (symbol)	160205.IB	160008.IB	160019.IB
Maturity (years)	20	30	30
Issuance (billion)	134.5	90.1	97.7
Increase in yields (basis points)	70	61	62
Change in net price (percent)	-8.98	-10.48	-10.88
Decline in trades (number)	89	66	68

Sources: China Financial Futures Exchange; and WIND Economic Database (www.wind.com.cn).

Note: Data were collected between November 28, 2016, and December 20, 2016.

TABLE 6.3.

	5-Year Treasury Bond Futures		10-Year Treasury Bond Futures	
	3 Years before Launch	3 Years after Launch	2 Years before Launch	2 Years after Launch
	September 6, 2010 to September 5, 2013	September 6, 2013 to September 5, 2016	March 20, 2013 to March 19, 2015	March 20, 2015 to March 19, 2017
Subscription	1.66	2.44	1.96	2.80
Change (%)	—	+47	—	+42.86

Sources: China Financial Futures Exchange; and WIND Economic Database (www.wind.com.cn).

on average oversubscribed 1.68 times. During the three years after the futures launch (September 6, 2013, to September 5, 2016), the underlying bond was oversubscribed 2.44 times, up 45.18 percent from the previous level. Similarly, during the two years before the launch of 10-year Treasury bond futures (March 20, 2013, to March 19, 2015), 10-year Treasury bonds were on average oversubscribed 1.96 times. In the two years after the futures launch (March 20, 2015, to March 19, 2017), the underlying bond was oversubscribed 2.80 times, up 42.86 percent from the previous level. Subscription to deliverable Treasury bonds is significantly higher than nondeliverables issued in the same period. For instance, Treasury bond 170010 (deliverable, issued in 2017) was oversubscribed 2.2 times, 37.5 percent higher than other interest-bearing Treasury bonds issued in the same period.

SUGGESTIONS FOR FURTHER DEVELOPMENT

China's Treasury futures market has progressed markedly in the past five years, but challenges remain. To further develop the market, it is essential to diversify product offerings, improve investor composition, and expand market access to foreign investors.

TABLE 6.4.

Treasury Futures Products in Global Markets						
	2-Year	5-Year	10-Year	Ultra-10-Year	20-Year	30-Year
United States	✓	✓	✓	✓	✓	✓
Germany	✓	✓	✓	—	—	✓
China	✓	✓	✓	—	—	—

Sources: China Financial Futures Exchange; CME; and Eurex Exchange.

Diversifying Product Offerings

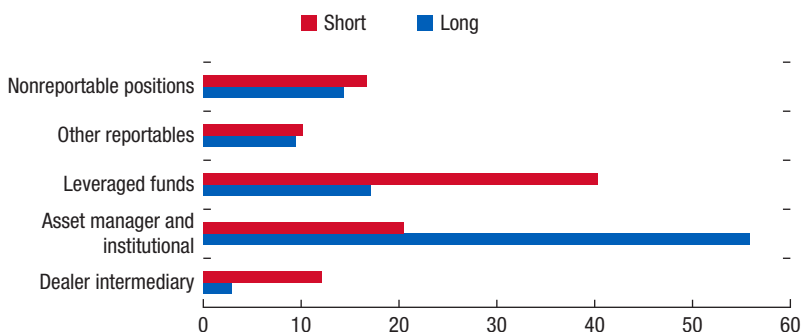
In developed markets such as those in the United States and Germany, Treasury futures usually cover 2-year T-notes, 5-year T-notes, 10-year T-notes, Treasury bonds, and Ultra Treasury bonds (30-year) (Table 6.4). The United States also introduced Ultra 10-year Treasury note futures to improve the Treasury yield curve. In 2017, US 10-year T-note futures, 5-year T-note futures, 2-year T-note futures, and US Treasury bond futures ranked, respectively, the world's first, second, fifth, and seventh most actively traded Treasury futures by trading volume, according to the CME. Average daily trading volume was 1.495 million, 0.900 million, 0.387 million, and 0.292 million contracts, respectively. And average daily open interest was 3.245 million, 3.120 million, 1.487 million, and 0.712 million contracts.

In comparison, Treasury futures offered in the Chinese market now cover the 2-year, 5-year, and 10-year products. Market participants' diversified demands for risk management are yet to be met with more futures products covering the long term. Today, bond issuance and trading in China are highly market driven. Based on its management policy of Treasury bonds with key maturities—and since 2018—the Ministry of Finance now has nine issues of 30-year Treasury bonds. This ensures abundant supply of deliverable bonds for the launch of 30-year Treasury bond futures. Meanwhile, the orderly functioning of 5-year and 10-year Treasury bond futures over the years and the recent addition of 2-year Treasury bond futures to the product suite offer extensive experience for the launch of Treasury bond futures with different terms. As such, China may consider launching 30-year Treasury bond futures as well as Treasury futures options in the next phase.

Improving Investor Composition

Globally, the investor composition of Treasury futures markets resembles that of the cash market. In the United States, for instance, institutional investors are the major participants in the cash market. Likewise, the futures market is mainly driven by institutional investors such as asset management companies, leveraged funds, and dealers. Asset management companies include pension funds,

Figure 6.8. CME Treasury Futures Short and Long Positions, by Participant (Percent)



Source: US Commodity Futures Trading Commission.

endowments, insurance companies, mutual funds, and other asset managers with institutional clients. Dealers are institutions that design and sell products to their clients and are mainly large commercial banks. Other participants include finance departments of nonfinancial institutions, central banks, and small banks. By the end of August 2018, asset managers and institutions held 56 percent of the long positions in US Treasury futures; leveraged funds, 17 percent; and dealer intermediaries, 3 percent. Of the short positions, asset managers and institutions held 20 percent; leveraged funds, 40 percent; and dealer intermediaries, 12 percent (Figure 6.8).⁷

Given that indirect financing is the mainstream in China, commercial banks are the major participants in the Treasury bond market. However, they are not yet allowed by regulators to participate in the Treasury futures market. By the end of August 2018, Treasury bonds held by commercial banks amounted to RMB 8.33 trillion, 64 percent of total market value (see also Chapter 3 on sovereign yield curves). As continuous progress is being made in liberalizing interest rates, commercial banks and insurance companies have a growing need to hedge interest rate risks. Access to Treasury futures helps them to do so and therefore increases their intention to hold and trade bonds, which in turn facilitates the steady growth of the cash market. In addition, China's asset management industry is undergoing major changes, with products transforming toward mark-to-market valuation. Commercial banks also need to change the model of their asset management business. Again, they need Treasury futures to hedge risks as they strive to provide more diversified and secure products for investors.

Moreover, China has continued to advance bond market opening in recent years. International investors are now able to access the bond market through the Qualified Foreign Institutional Investor/Renminbi Qualified Institutional

⁷ https://www.cftc.gov/dea/futures/financial_lf.htm.

Investor (QFII/RQFII) regime, as People's Bank of China–approved foreign institutional investors in the China Interbank Bond Market or through Bond Connect. By the end of August 2018, Treasury bonds held by foreign institutions reached RMB 1,034.3 billion, up RMB 427.8 billion from the end of 2017, an increase of 71 percent. Such a large jump surpassed that of any other type of investor. Despite their active participation in the cash market, however, foreign institutions cannot yet access the Treasury futures market. This situation entails a potential risk that foreign institutions' capital flows into or out of the bond market due to lack of hedging tools may adversely impact the exchange rate. It is therefore imperative to open China's Treasury futures market to foreign investors, which would help improve the investment environment in the cash market and enhance interest-rate and exchange-rate stability.

Diversifying Trading Mechanisms

Participating in the bond market requires a high level of professional knowledge. The majority of participants are therefore institutions. To cater to participants' sizable demand for risk management, Treasury futures markets worldwide adopt alternative trading mechanisms in addition to auction, such as block trade,⁸ exchange for physicals,⁹ exchange for swap,¹⁰ exchange for risk, and so on. Those alternative mechanisms are important for meeting institutions' demands for hedging and strategy-based trading, underpinning futures market stability in and beyond China.

In comparison, no alternative mechanism is available in addition to auctions in China's Treasury futures market. As major institutional investors like commercial banks and insurance companies enter the market, demand will grow for more diversified trading mechanisms. As such, introducing exchange for physical or block trade would provide institutional participants with more flexibility and efficiency, enabling the market to develop in a stable and healthy manner.

CONCLUSIONS

The introduction of Treasury futures in 2013 has already enhanced liquidity, improved the efficiency of price discovery, and allowed investors to better manage interest rate risk, contributing to the development of the cash bond market. So far, the China Financial Futures Exchange has launched 2-year, 5-year, and 10-year Treasury bond futures, with 10-year futures accounting for about 70 percent of the market and 80 percent of daily trading volume. To minimize risks—given the relatively low liquidity of China's cash market—the futures market requires physical settlement based on a bond delivery basket with a

⁸ An order to trade a large quantity of securities.

⁹ A transaction in which a futures contract is exchanged for the actual physical good.

¹⁰ A privately negotiated transaction where a futures contract for a physical item is exchanged for a cash settled swap contract.

specified coupon and delivery maturities. But before mandatory delivery on expiry day, sellers can opt for delivery in a voluntary period. In 2017, delivery-versus-payment was introduced for eligible positions.

Going forward, further advances in the Treasury futures market will not only allow investors to better hedge risk, but will also strengthen the underlying cash market. In particular, introducing more diversified products, such as longer-term Treasury bond futures and Treasury futures options with different terms, would meet the market's diversified risk management needs and strengthen the bond yield curve. Another area for reform is improving investor composition. Further financial sector liberalization needs to go hand in hand with the ability of institutions and investors to hedge risks. Because about 70 percent of Treasury bonds are held by commercial banks, allowing them to participate in the Treasury futures market will contribute to better interest rate risk management and, in turn, increase cash market liquidity. The same is true of foreign investors, who increasingly have access to the domestic bond market through the different quota schemes and China's Interbank Bond Market through Bond Connect but have not been able to participate in the Treasury futures market. In addition, to better meet investors' diversified needs for hedging and strategy-based trading—and based on international experience—China could consider providing alternative trading, in addition to its current auction-based system, such as block trade, exchange for physicals, exchange for swap, and exchange for risk.

ANNEX 6.1. CONTRACT SPECIFICATIONS FOR TREASURY BOND FUTURES

ANNEX TABLE 6.1.1.

Two-, Five-, and Ten-Year Bond Futures			
	2-Year	5-Year	10-Year
Underlying bond	Nominal short- to medium-term Treasury bonds with face value of RMB 2 million and coupon rate of 3 percent	Nominal medium-term Treasury bonds with face value of RMB 1 million and coupon rate of 3 percent	Nominal long-term Treasury bonds with face value of RMB 1 million and coupon rate of 3 percent
Deliverable bond	Book-entry interest-bearing Treasury bonds with an original maturity of no more than 5 years and a remaining maturity of 1.5 years to 2.25 years upon the first day of the expiry month	Book-entry interest-bearing Treasury bonds with an original maturity of no more than 7 years and a remaining maturity of 4 years to 5.25 years upon the first day of the expiry month	Book-entry interest-bearing Treasury bonds with an original maturity of no more than 10 years and a remaining maturity of no less than 6.5 years upon the first day of the expiry month
Quotation	RMB 100 net price		
Tick size	RMB 0.005		
Contract months	Three most recent quarterly months (March, June, September, and December)		
Trading hours	9:15 am–11:30 am; 1:00 pm–3:15 pm Last trading day: 9:15 am–11:30 am		
Limit up/down	±0.5 percent of the settlement price on the previous trading day	±1.2 percent of the settlement price on the previous trading day	±2 percent of the settlement price on the previous trading day
Minimum margin requirement	0.5 percent of contract value	1 percent of contract value	2 percent of contract value
Last trading day	Second Friday of the expiry month		
Delivery method	Physical delivery		
Last delivery day	Third trading day after the last trading day		
Transaction code	TS	TF	T

Source: China Financial Futures Exchange.

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Green Bonds

**MA Jun, LIU Jialong, CHEN Zhouyang,
and XIE Wenhong**

In the report delivered at the 19th National Congress of the Communist Party of China in 2017, President XI Jinping emphasized that building an ecological civilization would be a “millennium project for the sustainable development of the entire nation,” and stressed the need to “construct a market-oriented system of innovation for green technology, develop green finance, as well as expand energy conservation and environmental protection industries, clean production industries, and clean energy industries.”

The Party Congress report signals that the Chinese government has elevated the development of green finance to the level of a national strategy, in an effort to provide real support to the country’s green sectors.

The rapid growth of China’s green bond market is a testament to both the strong policy support and the enormous potential of China’s green finance system. Although the green bond market was launched in China only in December 2015—when the People’s Bank of China first introduced green financial bonds in the country’s interbank bond market and the Green Finance Committee of the China Society for Finance and Banking published its Green Bond Endorsed Project Catalogue—it became the world’s largest within a single year, making up 40 percent of total green bond issuance in 2017. In recent years, innovative securitized products such as green covered bonds¹ and green asset-backed securities are also beginning to emerge, thanks to improvements in the regulations and service of the green bond market, as well as increasing international cooperation.

DEFINITIONS OF GREEN BONDS IN CHINA

An important precondition for the effective functioning of green financial products, such as green bonds and green loans, is to have a clear definition of what is and is not “green.” A unified classification system, or taxonomy, serves the

¹ Green covered bonds have green features on both the use of proceeds and the supporting asset pool. The proceeds will only be used for eligible green projects and the underlying assets are also green assets.

purpose of preventing “green washing,” enabling measurement of green performance, and applying policy incentives for green products.²

In China, the Green Bond Endorsed Project Catalogue developed by the Green Finance Committee of the China Society for Finance and Banking (under the supervision of the People's Bank of China) and the Green Bond Guidelines issued by the National Development and Reform Commission are currently in use. The majority of green bonds issued in China follow the People's Bank of China Catalogue.

So far, there has not been a global consensus on a green taxonomy. Nevertheless, four globally recognized principles and standards for green bonds are currently used. In addition to the People's Bank of China's Catalogue, there are the Green Bond Principles developed by the International Capital Market Association, the Climate Bonds Taxonomy by the Climate Bonds Initiative, and the Common Principles for Climate Mitigation Finance Tracking developed by the joint climate finance group of multilateral development banks and the International Development Finance Club.

THE GLOBAL GREEN BOND MARKET

According to the strict definition used by the Climate Bonds Initiative,³ the total global issuance of green bonds in 2017 amounted to US\$155.5 billion, the highest annual issuance to date, representing a 78 percent increase from the total issuance of US\$87.2 billion in 2016.⁴

The three biggest issuers are the United States, China, and France. The US mortgage guarantor, Fannie Mae, is the largest single issuer. It issued US\$24.9 billion green mortgage-backed securities in 2016, putting the United States ahead of China as the world's largest green bond market. If that specific green securitized product is excluded, China's total green bonds issuance would rank first in the world, and the United States second.

Upon the urging of Group of Twenty countries and international organizations, many countries and regions have begun researching or establishing green finance policies and road maps, and many have launched green bond markets. In 2017, 239 issuers from 37 countries issued green bonds, 146 of them for the first

² “Green washing” here refers to any spinning effort on the part of a firm to claim that proceeds will be used for green projects but they are actually used for nongreen projects.

³ The narrowly defined standard of the Climate Bonds Initiative focuses on measures addressing climate change, and is therefore more strict than other green standards. The former does not include the upgrading of power stations burning fossil fuels, clean coal, greater efficiency in coal use, transmission infrastructure for power grids using fossil fuel energy, large hydropower projects (greater than 50 megawatts), landfill waste treatment, and other projects with no clear climate benefits. The standard also requires that 95 percent of funds raised should go to green projects.

⁴ Based on a broader definition (that is, the total sum of green bonds each country calculates based on its own definition), the total sum of green bonds in 2017 was US\$169.4 billion, according to the Climate Bonds Initiative.

time, according to Climate Bonds Initiative statistics, reflecting a trend toward annual expansion of the issuer base.

Looking especially at sovereign green bonds, in 2017, France, Fiji, and Nigeria issued sovereign green bonds. Among those, the French government's green bonds—€700 million to increase environmental investment—were well received by the market. Internationally, renewable energy investment remains the most popular destination for the proceeds. It is notable that funds spent on low-carbon buildings and energy-efficiency projects have grown 2.4 times year over year, up from 21 percent of total loans in 2016 to 29 percent in 2017.

OVERVIEW OF CHINA'S GREEN BOND ISSUANCE

Since the inception of China's green bond market in 2016, China has issued 184 green bonds, totaling RMB 479.91 billion, or about 27 percent of green bonds globally.⁵ The majority of issuance was onshore (167 bonds totaling RMB 409.71 billion), while the rest was issued in offshore financial centers, mostly in Hong Kong SAR.

In 2017 alone, China issued 123 green bonds totaling RMB 249 billion, including green bonds and green asset-backed securities. Of these, 113 bonds totaling RMB 204.48 billion were issued domestically.⁶ According to the China Financial News Green Bonds Database, green bond issuance fell in the first half of 2017 because of fluctuations in interest rates but rebounded in the second half.⁷ The growth of issuance for the whole year was 7.6 percent. The total issuance from China in 2017 accounted for 22 percent of green bonds issued globally.⁸

In 2017, the issuers of green bonds (not including green asset-backed securities) in China became more diverse (Figure 7.1), and their issued bonds have received further differentiated credit ratings. Green bonds with maturities of one and two years were issued for the first time, together with a general increase in the issuance of bonds of longer maturity (Figure 7.2). The proceeds are primarily going to clean energy, pollution clean-up, clean transportation, and other related sectors (Figure 7.3).

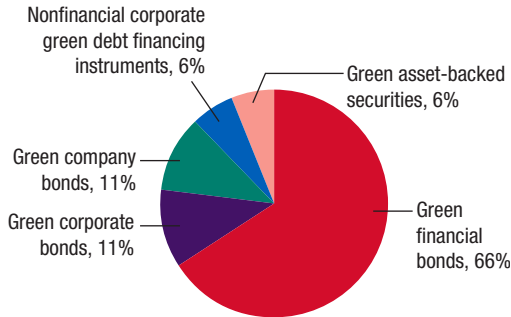
⁵ The denominator is also calculated based on a broad definition.

⁶ Domestic issuance means green bonds issued through the capital markets in mainland China, excluding Hong Kong SAR. If not otherwise specified, the meaning of this term remains the same throughout the chapter.

⁷ The database includes standard-compliant green bonds, that is, green bonds recognized under the Directory of Supported Green Bond Projects compiled by the Green Finance Committee and the Green Bond Issuance Guidelines of the National Development and Reform Commission.

⁸ The denominator is broadly defined, which includes the total quantity of green bonds issued by each market (country) according to its own definition for these bonds.

Figure 7.1. Shares of Green Bond Issuance in China since 2016, by Raised Capital



Source: China Financial News Green Bonds Database, as of November 12, 2018.

TRENDS IN CHINA'S GREEN BOND MARKET

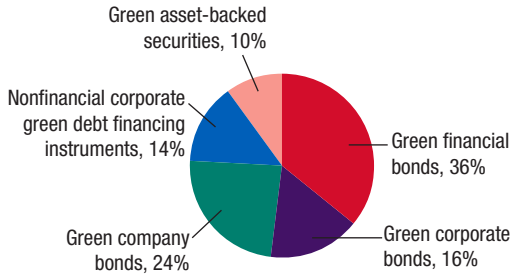
The green bond market in China is continuously moving forward through product innovation, regulation improvement, and international cooperation.

Green Bond Indices

Green bond indices can reveal many dimensions of market trends in the green bond space, and provide investors with diverse performance benchmarks and investment targets. Such indices can also help promote domestic and international investment in China's green bond market, and by extension, foster the development of green industries. In 2017, participants in China's green bond market have enhanced efforts in research, development, and innovation of green bond indices. However, further improvements are still needed when it comes to applying the indices to investments.

In 2016, the China Central Depository and Clearing Co., the China Energy Conservation and Environmental Protection Group Consulting Co., and Industrial Bank (China) jointly published China's first green bond indices, the ChinaBond China Green Bond Index and ChinaBond CIB Green Bond Index. In addition, the Shanghai Stock Exchange and China Securities Index Co. published the Shanghai Stock Exchange Green Corporate Bond Index, Shanghai Green Bond Index, and the Green Securities Exchange Bond Index in June 2017.

Figure 7.2. Shares of Green Bond Issuance in China since 2016, by Number of Bonds



Source: China Financial News Green Bonds Database, as of November 12, 2018.

The first two indices are now on real-time display on the Shanghai and Luxembourg stock exchange websites, with an aim to attract international investors.

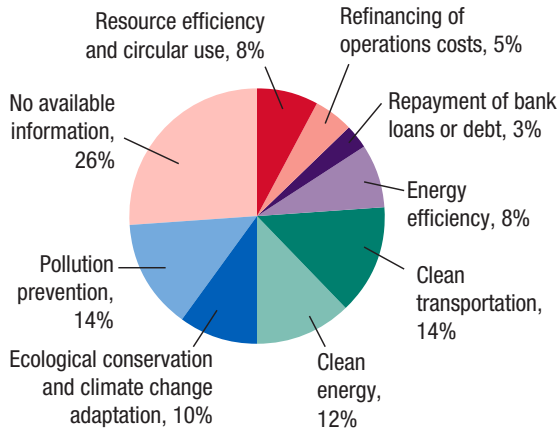
Meanwhile, the International Institute of Green Finance at the Central University of Finance and Economics, the Shenzhen Stock Exchange, and the Luxembourg Stock Exchange jointly launched the first green bond index that is synchronously on display in China and Europe, the Central University of Finance and Economics (CUFE)–CNI Green Bond Index. In addition, the ChinaBond Pricing Center Co. included nine local government bonds in the ChinaBond China Green Bond Index and ChinaBond China Green Bond Select Index.

In the wealth management market, in June 2017, Industrial Bank launched Wanlibao-Green Finance, an index-based financial product that uses the ChinaBond CIB Green Bond Index as its benchmark and tracking target. It is also the first financial product based on green bond indices in China. The product invests its principal based on the ChinaBond CIB Green Bond Index, and dynamically sets the benchmark for performance comparison.

PRODUCT INNOVATION

While China's green bond market is a relative latecomer, it has grown rapidly since its inception. The market reaction is particularly striking for certain innovative products such as green covered bonds and green asset-backed securities.

Figure 7.3. Use of Green Bond Proceeds since 2016



Source: China Financial News Green Bonds Database, as of November 12, 2018.

Note: Circular use is related to the circular economy, which is a framework for an economy that is restorative and regenerative by design.

In November 2016, the London branch of the Bank of China, a Chinese commercial bank with a global presence, issued US\$500 million of green cover bonds. It used the Bank of China's green assets inside China as the encumbered asset pool⁹ to provide guarantee payment obligations incurred by the bonds, and the bank used the funds for its green credit and loan projects inside China. The assets in the encumbered asset pool are all sample bonds from ChinaBond China Climate-Aligned Bond Index, which qualify as green both in terms of the purpose of the investment expenditure and the type of asset pool. Such instances of issuance set the standard in Chinese and international green markets and can be seen as an important achievement in the China–United Kingdom Economic and Financial Dialogue.

Meanwhile, the bonds issued were rated a notch above the rating of the Bank of China, owing to a credit-enhancing effect from the structuring of its asset pool. This asset pool structuring also lowered the financing costs for the Bank of China by 15 basis points. At a coupon rate of 1.875 percent and the final issue spread of 95 basis points, the outcomes achieved a narrower spread than other non-green senior debt issued by the Bank of China during the same period, making it a

⁹ An encumbered asset pool is one where the asset has been pledged or is subject to any form of securitization, collateralization, or transaction from which it cannot be freely withdrawn.

successful pilot for Chinese banks that are interested in developing low-cost financial channels.¹⁰

The securitization of assets, using future cash flows as the underlying asset for structured financing, is well tailored to the financing needs of organizations dedicated to green projects. The number of green asset securitized products in China increased from 6 in 2016 to 10 in 2017. The total funds raised from those products also grew by RMB 6 billion to RMB 14.6 billion in 2017. Green asset securitized products, which include green asset-backed securities and green asset-backed notes, now represent 5 percent of China's domestic green bond market.

Among the 12 green asset-backed securities issued since 2016, the original holders of the 10 green securitized products in nonfinancial industries all belong to green industries, including enterprises in wastewater treatment, subway and highway transport, and hydro and wind power. In 2017, China's first commercial mortgage-backed securities to receive green certification from a third party, Harvest Capital CECEP Green Building Asset Backed Special Plan, was launched at the Shenzhen Stock Exchange.

A number of additional innovative green bonds were also issued in 2017. RHZL, an investment and financing company under China Power Investment Corporation, issued the first "purely dual-green" asset-backed note inside China.¹¹ The Beijing Enterprises Water Group (China) Investment issued the first asset-backed note in China. Zhejiang Tailong Commercial Bank issued the first green financial debt for small and medium enterprises. In addition, green financial bonds were made available to individual investors for the first time. China Development Bank, in issuing RMB 5 billion of thematic Yangtze River Economic Belt Water Resources Protection green financial bonds, for the first time retailed bonds of no more than RMB 600 million to the public.

THE CHINESE GOVERNMENT'S ROLE IN DEVELOPING THE GREEN BOND MARKET

Since 2015, China has been continuously refining policy and regulations to promote green bonds as a tool to finance environmental solutions. This effort has led to rapid growth in China's green bond market since 2016, as well as further regulation of bond issuance. The key initiatives to scale up green bonds in China include the Green Bond Endorsed Project Catalogue (2015) and the Guidelines for Establishing the Green Financial System, as well as a wide variety of policy documents, pilot programs, and supporting mechanisms, which have been used

¹⁰ For more information, see the Bank of China website at http://www.boc.cn/aboutboc/bi1/201611/t20161104_7978208.html.

¹¹ The term "dual green" refers to investments that can be classified as green both in terms of the purpose of the investment expenditure and the type of asset pool.

to set standards for information disclosure, evaluation and certification, use of proceeds, and supervision.

China's local governments are also playing a critical role in spurring green bond issuance through a combination of policy and regulatory supports and fiscal and financial measures. For instance, the provincial government of Jiangsu announced an interest subsidy of 30 percent toward green bond and green asset-backed securities. It also provides a cash reward (RMB 300,000, or US\$43,400) for each bond issuance for third-party guarantors of green bonds, as well as a risk compensation mechanism (covering 30 percent of actual loss) to third-party guarantors of aggregate green loans that are tailored to small and medium enterprises.¹² In 2017, the State Council set up pilot zones in five provinces, Guangdong, Guizhou, Jiangxi, Zhejiang, and Xinjiang, to promote green finance reform and innovation. The provincial and municipal governments from the pilot programs provide subsidies and establish facilities such as local green project information sharing platforms to encourage the use of proceeds.

Since 2017, various regulatory authorities have issued detailed regulations, including opinions and business operation guidance to lead and discipline the development of green bonds. In March 2017, for example, the China Securities Regulatory Commission issued the Guidelines to Support the Development of Green Bonds, defining in principle the issuing entity, purpose of capital spending, information disclosure, management requirements, and related policy measures. In the meantime, the National Association of Financial Market Institutional Investors published the Guidelines for Non-financial Enterprise to Issue Green Debt Financing Tools and related forms, clarifying the type of information, including project vetting and capital management, that enterprises should disclose in issuing green debt financing instruments. For the first time, the guidelines require the issuer to disclose the environmental benefit of the project and encourage third-party certification agencies to assess and certify before and after the issuance of the instrument. Meanwhile, the guidelines also set out measures to encourage agencies to disclose the extent of a project's green credentials, and to define the extent to which green debt financing instruments can be integrated into funds raised by green financial bonds. Last, the guidelines aim to develop green channels and encourage the formation of a green investors' alliance.

It is notable that the Chinese national government has also promoted third-party green verification as an important means for information disclosure, as it provides guarantees of both the authenticity and reliability of green bonds. In December 2012, for example, to improve the verification standard of green bonds and to avoid the risk of "green washing," the People's Bank of China and the China Securities Regulatory Commission jointly issued the Green Bond

¹² "Xinhua: Jiangsu Province to Provide 30 Percent Interest Subsidies on Green Bond Issuance." <http://greenfinance.xinhua08.com/a/20181011/1780880.shtml>.

Assessment and Verification Guidelines. This is the world's first guiding document that verifies the verifiers of green bonds, stipulating related requirements on the agencies' qualifications, bidding procedures, operations, issuing of reports, and supervision and management.

DEEPENING INTERNATIONAL COOPERATION

In 2017, the European Investment Bank and the Green Finance Committee jointly conducted a study on the standardization of green bonds in China and Europe. The parties aimed to promote cross-border green capital flows and to strengthen collaboration between China and Europe in green bonds and green finance space. At the United Nations Climate Change Conference held in Bonn, Germany, in November 2017, *The Need for a Common Language in Green Finance—A White Paper*, was published after the joint European Investment Bank–Green Finance Committee study. The paper compared green bond standards in countries to provide a basis for raising comparability and consistency across green bonds in China and the European Union.

In September 2017, the China–United Kingdom Green Finance Taskforce released its mid-term report, which recommended China's green bond database be made available to investors worldwide. The report also recommended that the Hong Kong Stock Exchange consider using the database under Bond Connect, a recently launched mutual market access scheme, to build a green bond section, or a “green bond connect,” that allows international actors to invest directly in China's green bond market.

The influence of Chinese issuers on the international bond market has also been growing. Deeper connection and convergence between green bond markets can be attested to by the issuance of offshore green bonds by several Chinese-owned institutions. In October 2015, the China Agricultural Bank issued a green bond in the United Kingdom, making it the first Chinese bank to issue a green bond overseas. Since then, the Industrial and Commercial Bank of China, the Bank of China, and several others have issued green bonds compliant with international standards, effectively promoting and leading the global development of green bonds.

In 2017, Chinese-owned issuers continued to make their presence felt in the international green bond market. In addition to issuing green senior bonds and green covered bonds, the Bank of China issued its third green bond offshore.

It is notable that, in October 2017, the Industrial and Commercial Bank of China issued the Belt and Road Initiative Green Climate Bond through its Luxembourg branch. The bond was listed on the Luxembourg Stock Exchange. China Development Bank also issued China's first quasi-sovereign international green bond, verified by the Climate Bonds Initiative. The bond is now listed on the Hong Kong Stock Exchange and the China Europe International Exchange.

In addition, the Bank of China issued about US\$1.5 billion (equivalent) in climate bonds through its Paris branch. These bonds not only were compliant with the latest standards laid out in the Green Bond Principles (2017), but also received standards-consistent verification from the Climate Bonds Initiative, as the first green bond denominated in three currencies verified by the Climate Bonds Initiative. In addition, the China Three Gorges Corporation became the first company from China's real sector to issue a green euro bond, while the China General Nuclear Power Group issued a green euro bond for the first time in 2017.

RISKS AND UNCERTAINTIES OF INVESTING IN THE GREEN BOND MARKET IN CHINA

At present, the taxonomy of green bonds in China is not harmonized. This may lead to weak connectivity between different financial products and tools, as well as difficulty in the implementation of incentive and penalty mechanisms, especially in the fiscal space. The market participants may seek to arbitrage different regulatory policies, and may tend to engage in “green washing.” Therefore, the establishment of unified standards would be important for strengthening and improving the current green financial system.

In addition, green bond products in China typically have low liquidity in the secondary market. The development of the green bond market has occurred amid a backdrop of enhanced financial regulation in China, which is partly attributable to an ongoing deleveraging process and prudent monetary policy.¹³ Nonetheless, green bond issuance will likely be less affected, partly because of strong policy support and regulatory incentives from the government.

RECOMMENDATIONS FOR FURTHER DEVELOPING THE GREEN BOND MARKET

Even though China's green bond market has developed rapidly, it still faces problems and challenges, including relatively weak incentive mechanisms, insufficient understanding of green investment by investors, as well as inadequate products and tools. The green bonds issued in China constitute a mere 2 percent of total bond issuance. Nevertheless, the needs for green financing are growing quickly and are estimated at trillions of dollars annually in the medium to long term, creating enormous potential for green bonds.

On the basis of the existing characteristics and challenges faced by China's green bond market, several recommendations are offered to scale up the green bond market in China:

¹³ “Climate Bonds Initiative: China Green Bond Market 2017.” https://www.climatebonds.net/files/reports/china_annual_report_2017_en_final_14_02_2018.pdf.

1. Promote Awareness of Green Bonds among Potential Issuers

Even though nearly 100 entities in China have issued green bonds, the majority of potential issuers (including banks, real sector enterprises, and government entities participating in medium- and long-term green projects) still lack a basic understanding of the green bond market. As such, industry associations, underwriters (such as banks and securities dealers), and third-party service providers (green bond verifiers and rating agencies) should reach out to potential clients, as well as build awareness that green bonds can help solve the problem of maturity mismatch, build up the market reputation of the issuer, and win future clients. Steps should be taken to increase firms' awareness that the effort toward becoming a "green company" can help solve environmental risk and obtain policy support from the government.

2. Improve Green Bond Standards, Quality of Verification and Assessment, and Information Disclosure Mechanisms

Timely updates in green bond standards are needed as industrial policy and technology evolve. In revising its green bond taxonomy, China should consider increasing support for crucial yet less focused areas such as green construction and green agriculture. China should also consider setting up clearer standards that can be more readily adopted for controversial sectors, such as clean coal, based on the principle of encouraging "obvious environmental benefits" and transitioning to cleaner energy.

In the verification and assessment of green bonds, issuers should closely adhere to the Guidelines for Green Bond Assessment and Verification issued by the People's Bank of China and the China Securities Regulatory Commission. Financial institutions and firms should strengthen their due diligence efforts in verifying the environmental performance of portfolio companies and projects. And the quality of assessment and verification should be guaranteed. Issuers, especially banks, should disclose sufficient relevant environmental information, in particular on the flow of funding, to avoid reactions from the market that are based on inadequate or incorrect information.

3. Strengthen Incentives for Green Bonds

A common complaint from the issuers of green bonds has been that the green bond issuance incurs extra verification and disclosure costs, reducing their willingness to participate. The Guidelines for Establishing the Green Financial System, which were jointly issued by seven Chinese ministries, call for supporting green finance development through measures such as central bank macroprudential assessment and refinancing, and guarantees, as well as interest rate subsidies from the local government. These incentive measures can reduce costs, while other efforts should also be made to explore more concrete and feasible solutions. For example, local governments in Huadu district of

Guangzhou province and Huzhou and Quzhou in Zhejiang province have rolled out subsidies for green bonds, while Shanghai issued measures to cover the cost of verification for medium and small green bond issuers. These practices should be promoted and emulated.

4. Encourage Product Innovation, Expand Securitization of Green Assets, and Support Green Buildings

Financial institutions should increase innovation in green bond products through measures such as issuing collective green bonds for small and medium enterprises, promoting investment in and application of green bond indices, and further developing green asset-backed securities products.

Green asset-backed securities, using cash flow from the underlying assets for financing, provide fast, long-term, and stable funding for enterprises through a different credit enhancement method. Not only is this in line with the distinct features of development in the green sector, but it also helps ensure at the outset that funds are used for designated green projects and increases the effectiveness and precision of resource allocation. It can make use of existing assets and provide innovative investment products, matching the diverse needs of the investor and the borrower. The underlying assets for green asset-backed securities can gradually expand to include renewable energy, pollution prevention and management, and other types of green assets.

China should also explore the model through which green bonds support green building. At present, most capital raised through green bonds and other green financial instruments in China flows to green energy, green transport, and environmental protection, while green building receives only a small portion. The policy on standards and implementation guidelines for green building should be accelerated. At the same time, financial regulators can work together with the Ministry of Housing and Urban-Rural Development and the National Development and Reform Commission to explore measures to support green building through financial instruments, including green loans and green bonds.

5. Cultivate Green Institutional Investors

The majority of institutional investors in China are only beginning to learn about the concepts of green investment and responsible investing. Their investment preference for green assets, including green bonds, is still lukewarm. Efforts to cultivate green investors can create strong demand for the green bond market in eight areas:

- Build and improve compulsory environmental information disclosure for listed companies and bond issuers
- Run a publicity campaign to popularize green investment to raise long-term returns
- Provide government backing for long-term investors to pioneer green investments

- Encourage the development of green financial products
- Support the ranking, rating, and assessment of third-party agencies for green assets
- Strengthen capacity building in areas such as environmental risk analysis
- Encourage Chinese institutional investors to disclose environmental information
- Encourage Chinese institutional investors to adopt principles of responsible investing

6. Strengthen International Cooperation in the Green Bond Sector

China should encourage state-owned institutions to issue more offshore green bonds and foreign institutions to issue green panda bonds in China.¹⁴ When Chinese institutions issue offshore green bonds, more green capital is attracted to China, and issuers are provided with an important opportunity to understand and participate in international capital markets and to promote their corporate branding.

Overseas institutions that issue green panda bonds can expand the domestic green market and help advance internationalization of the renminbi. The China–United Kingdom and China–France Economic and Financial Dialogues were concrete steps toward green finance collaboration. Such progress not only encouraged all parties to issue green bonds in one another’s markets, but also attracted British and French institutional investors to China’s green bond market and helped promote the development of green asset securitization. To make it more convenient for foreign capital to enter China’s green bond market, related financial institutions and third-party service providers can consider developing green exchange-traded funds, offering products that are traded offshore, providing information on China green bonds in English, as well as developing more tools for research and analysis.

CONCLUSIONS

Since the inception of its green bond market in 2016, China has become one of the world’s largest green bond markets, gaining 40 percent of global market share in its first year. In addition to issuing more than 200 green bonds, China is also growing into a global leader in setting frameworks and institutions for green bond issuance and verification. In particular, China has come up with the definition and taxonomy of green bonds, formulated guidelines for verification, issued a licensing scheme for the verifiers, announced information disclosure standards for the issuers, and introduced a number of innovative products and

¹⁴ The term panda bonds denotes Chinese renminbi-denominated bonds issued by a non-Chinese organization inside the China mainland.

mechanisms to foster further development in the green bond space. The green bond ecosystem in China has become a global benchmark. Many countries, especially emerging markets, look to China's experience as they develop their own markets.

Green bonds have great potential for further growth both in China and on the global stage. At present, less than 1 percent of the world's bonds are labeled green bonds. In China, around 2 percent of China's bonds are considered "green." Experts in the field expect the size of the green bond market to grow to around 20 percent of total bond issuance in China to meet the market need for green investment. There are several things to watch for in green bond market development in China.

1. China Is Further Harmonizing Its Domestic Green Bond Taxonomies

A unified classification system ("taxonomy") for projects supported by green bonds is an essential step in the efforts to channel investments into sustainable economic activities. Without a clear green bond taxonomy, it is difficult for investors to distinguish between green and brown projects. The lack of a uniform standard may also create confusion and generate additional transaction costs. China is making progress in promoting the further harmonization of its two domestic green bond taxonomies and studying the design of a common standard for cross-border green bond investment.

2. China Is Making Progress in Issuing Its Sovereign and Subsovereign (Subnational) Green Bonds

Given their benchmark role in domestic debt markets, sovereign green bonds can support the market's further development, attracting new investors and providing strategic direction and an anchoring effect for other issuers. With countries such as France, Indonesia, Poland, and Nigeria issuing sovereign green bonds to support domestic green projects, subnational levels of the Chinese government (municipalities) are also currently preparing guidelines and planning for actual issuance of green sovereign bonds to support green investments.

3. China Is Expected to Play a Leading Role in Scaling Up Green Investment in the Belt and Road Countries

China's Belt and Road Initiative is providing huge investment opportunities for green infrastructure projects, especially since the first official mention of a "green coalition" along the Belt and Road in 2017. Going forward, green bonds are expected to be an indispensable financing instrument for development of infrastructure projects along the Belt and Road Initiative.

Asset-Backed Securities

ZONG Jun, LI Bo, and Laura E. Kodres

Asset securitization has long been recognized as a way to help overall financial market development, including the money market, the credit market, and the bond market. It can improve the efficiency of resource allocation in a country's financial sector by diversifying risks across potential investors, which in turn can revitalize idle assets and enhance the ability of the financial market to serve the real economy. Since the early 1990s, the asset-backed securities (ABS) market in China has gone through several phases, including exploration, pilot programs, stagnation, a relaunch of pilots, and full-scale rapid development. Over the past 20 years, the regulatory framework has continually improved and the market size has grown substantially, with rapid expansion of new types of underlying assets. Today, asset securitization plays an important role in serving the real economy and revitalizing idle assets.

The potential for development of asset securitization nonetheless remains vast, reflecting the enormous scale of bank credit assets (mostly loans), urgent demand for enterprise financing, and policy support. This chapter reviews the historical development of the ABS market in China, discusses current challenges, and provides policy recommendations, especially for improving legal frameworks, liquidity, information disclosure, credit ratings, and market connectivity.

OVERVIEW OF CHINA'S ASSET-BACKED SECURITIES MARKET

Asset-backed securities in China are categorized into credit asset-backed securities (credit ABS), enterprise asset-backed special plans (enterprise ABS), asset-backed notes for nonfinancial enterprises (ABN), and insurance asset-backed plans (insurance ABS).

Credit ABS are issued by financial institutions such as banks, automobile financing companies, consumer financing companies, and financial leasing companies on the interbank market. The People's Bank of China regulates issuance, while issuers are required to register at the China Banking and Insurance Regulatory Commission (CBIRC). Enterprise ABS are issued by nonfinancial

firms or financial institutions on the exchange market in Shenzhen or Shanghai and are regulated by the China Securities Regulatory Commission (CSRC). Only qualified investors are allowed to invest in enterprise ABS. ABNs are issued by nonfinancial companies on the interbank market and are regulated by the National Association of Financial Market Institutional Investors (NAFMII).¹ Insurance ABS are typically issued by insurance asset management firms, regulated by the China Banking and Insurance Regulatory Commission as well, and only insurance companies (and a few other sanctioned financial institutions) are allowed to invest in them. Table 8.1 provides an overview of the different products and markets.

Credit and enterprise ABS are the two major asset-backed products by market share. ABNs' share is relatively small, but is growing rapidly. Insurance ABS are developing slowly, and thus are not reflected in Figure 8.1.

Since the asset-backed securities market in China is still in its early phases, initiating institutions are cautious and most of them have adopted healthy assets with low realized default rates (so far) as underlying assets.² Most ABS do not have complicated structures and resecuritization products are rarely issued. At present, more than 80 percent of products are rated AA and above (Figure 8.2). As the global financial crisis revealed, however, risks related to ratings need to be closely monitored (Caprio, Demirgüç-Kunt, and Kane 2010).

Judging by the shift of the proportion of credit ratings during the tenure of ABS, credit ABS have achieved higher ratings, and a larger proportion of higher ratings, than enterprise ABS. This is probably because credit ABS are highly standardized, have better disclosure standards, and have good underlying assets. Meanwhile, because credit ABS are tiered securities, repaying their investors according to various priorities, high-priority tiers that are paid first from the cashflows in the securitization usually have higher credit ratings than others. Compared to credit ABS, low-priority tiers of enterprise ABS usually pay out interest to holders before maturity, with these withdrawals of cashflows lowering amounts that would otherwise allow excess collateral to remain for the safety of high-priority tiers. Also, the credit ratings of non-AAA securities mostly rely on the third parties to pay any shortfall in promised payments or an external credit enhancement, such as a guarantee of payments or overcollateralization. All those factors contribute to lower proportions of higher ratings for enterprise ABS. Furthermore, in the past two years, a larger proportion of enterprise ABS products have received lower ratings at inception, possibly because of a perception of potential improper management, lower expectations of underlying asset performance, and the operational risks of the initiators.

¹ The interbank market is an over-the-counter market used for trading bonds and other fixed income securities by institutional investors and regulated by the Peoples' Bank of China. The exchange market trades more types of securities, is open to other types of investors, and publishes trading prices, among other information.

² For some types of securities, the regulator needs to verify the existence and reliability of the underlying assets (so-called penetrating supervision).

TABLE 8.1.

Four Categories of Asset-Backed Securities in China				
	Credit ABS	Enterprise ABS	Asset-Backed Notes	Insurance ABS
Regulatory agencies	PBC and CBIRC	CSRC	NAFMII	CBIRC
Approval	Filing to CBIRC and registration at PBC	Reviewed and approved by the Shanghai or Shenzhen exchange; filing to the Asset Management Association of China	Register at NAFMII	Reviewed and approved by CBIRC for first issuance, after which similar products are allowed to report issuance
Special purpose vehicle	Special purpose trust	Special asset management plans	Special purpose trust/special purpose companies	Asset-backed plans
Initiating institutions	Financial institutions	Nonfinancial companies or financial institutions	Nonfinancial companies	Nonfinancial companies or financial institutions
Investors	Interbank market investors	Qualified investors; fewer than 200 investors	Interbank market investors	Insurance institutions and other qualified investors
Underlying asset	Credit asset	Debt or equity asset not on the Negative List ¹	Similar to enterprise ABS	Similar to enterprise ABS, Negative List ²
Trading market	Interbank market	The exchange market using the bidding system and securities companies as intermediaries	Interbank market	A specific trading platform for insurance assets
Register and clearance	China Central Depository and Clearing Co.	China Securities Depository and Clearing Corporation Limited	Shanghai Clearing House	Insurance exchange
Related regulations	"Administrative Measures for the Credit Asset Securitization Pilot Program"	"Administrative Regulations for Securities Company Asset Securitization Operations"	"Guidelines for Asset-Backed Notes of Non-Financial Enterprises on the Interbank Bond Market"	"Provisional Measures for the Administration of Asset-Backed Plans"

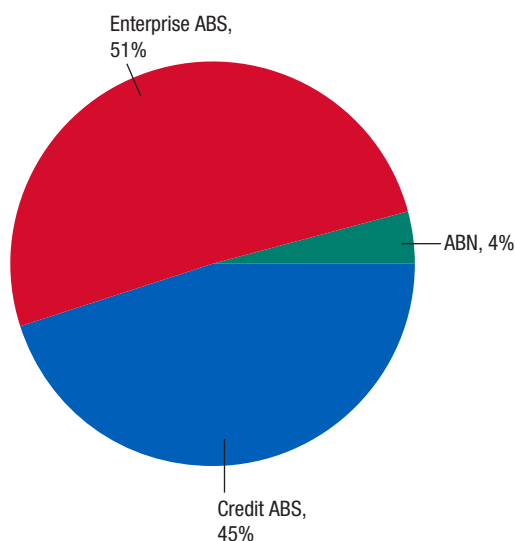
Source: Authors' compilations from various enacted regulations.

Note: ABS = asset-backed securities; CBIRC = China Banking and Insurance Regulatory Commission; CSRC = China Securities Regulatory Commission; NAFMII = National Association of Financial Market Institutional Investors; PBC = People's Bank of China.

¹ Negative List Regulation refers to the policy that as long as a certain business is not prohibited explicitly, companies can issue ABS securities from cash flows from this firm without prior approval of the regulators.

² Insurance ABS must also comply with penetrating supervision, which refers to the regulatory practice that the regulators verify the root sources of funding. For example, if the investor is a private equity fund, then the fund manager needs to provide information about the sources of the funding before purchasing insurance ABS products.

Figure 8.1. Stock of Asset-Backed Securities Issuance as of June 2018



Sources: China Central Depository and Clearing Co.; and WIND Economic Database (www.wind.com.cn).

Note: ABN = asset-backed notes for nonfinancial enterprises; ABS = asset-backed securities.

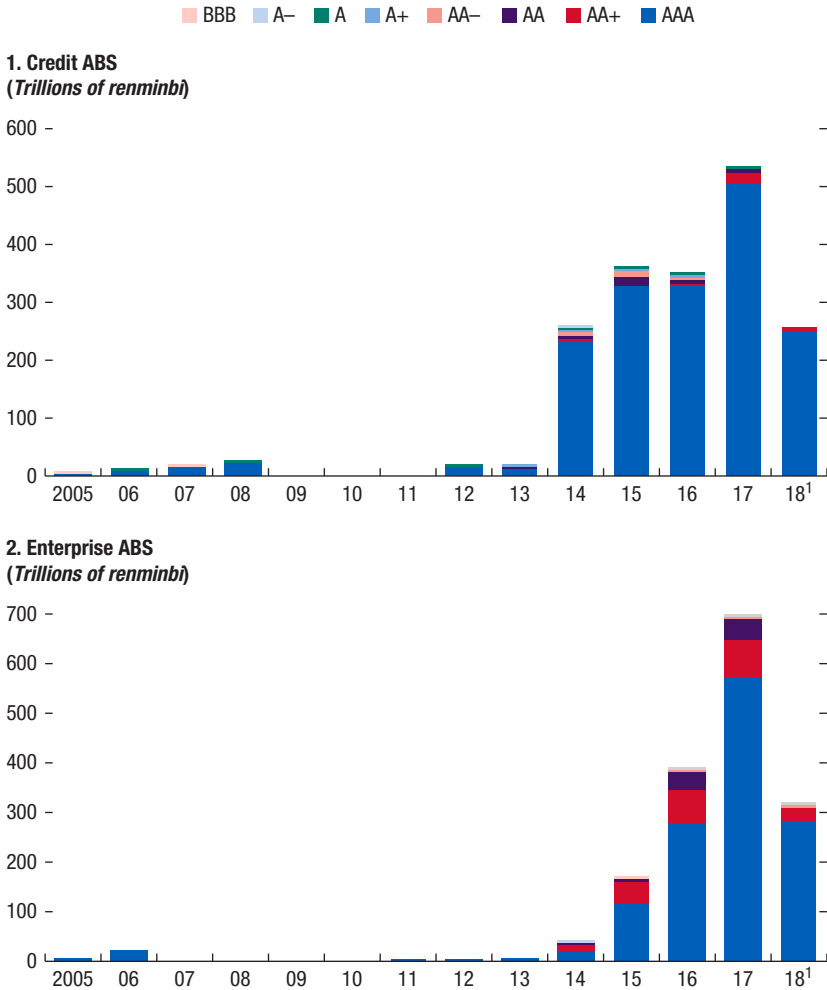
HISTORICAL DEVELOPMENT

This section reviews the development of the ABS market in the last two decades, which has been bumpy. It is an example of the unique financial development path in China, which often starts with pilot schemes, followed by temporary setbacks and interruptions in the middle stages, but steady expansion over the long term. Overall, the ABS market has progressed through five phases: (1) exploration from 1992 to 2004, (2) the pilot stage from 2005 to 2008, (3) stagnation from 2009 to 2011, (4) a relaunch of pilot programs from 2012 to 2013, and (5) a more normal development path from 2014 to the present.

1. Exploration, 1992–2004

From 1992 to 2004, both the market and regulatory agencies explored the market and regulations and conducted research to establish a practical and legal foundation for starting asset securitization in China.

Figure 8.2. Structure of Credit Ratings of Credit Asset-Backed Securities and Enterprise Asset-Backed Securities, 2005–18



Sources: China Central Depository and Clearing Co.; and WIND Economic Database (www.wind.com.cn).

Note: ABS = asset-backed securities.

¹ Data for 2018 are from January through July.

Market Exploration

Market exploration took place from the early 1990s as the economy developed rapidly and market participants sought to diversify and customize financing. Against this background, asset securitization—a financing option already mature

in European and US markets—gradually came into view in China, and some market institutions began independently exploring such operations.

In 1992, the Sanya Municipal Development Construction Company undertook China's first asset securitization, using land in the Sanya Danzhou subdivision as its underlying asset, and made a public offering of RMB 200 million in investment securities maturing in three years. It achieved “bankruptcy remoteness,”³ that is, it removed the liquidation risk of the underlying asset if the construction company went bankrupt by adding some guarantee clauses in the contract. For several years thereafter, market institutions mainly issued ABS abroad. In 1996, Zhuhai Expressway Company Limited issued a covered bond through a private placement in the United States using expressway toll collection rights as the underlying asset. In 1997, China COSCO Shipping Corporation also issued covered bonds in the United States and used the maritime shipping income of its North American subsidiary as the underlying asset. And in 2000, China International Marine Containers Group and ABN AMRO jointly offered asset-backed commercial paper using the trade service receivables of the group as the underlying asset.

From 2001 through 2004, Chinese financial institutions accelerated their exploration of asset securitization. In 2002, the Industrial and Commercial Bank of China and COSCO jointly initiated a US\$600 billion ABS offering, making it the first Chinese bank to launch an overseas securitization. In 2003 and 2004, China Cinda Asset Management Co., China Huarong Asset Management Co., and the Ningbo branch of the Industrial and Commercial Bank of China each successively disposed of nonperforming credit assets using asset securitization, representing an early attempt to securitize nonperforming assets.

Regulatory Exploration

After the 1990s, the need to reform China's financial system, improve the financing structure, and mitigate and control bank risk became increasingly urgent. Asset securitization, as a financial innovation able to revitalize idle assets, optimize resource allocation, and transfer risk, attracted not only the interest of market participants, but also the attention of China's financial regulators. Regulators recognized that several aspects of securitization required them to step in to provide legal certainty and appropriate infrastructure to allow the private market to develop safely.

Starting in 1998, the China Construction Bank (CCB) and China Development Bank (CDB) successively conducted research on asset securitization, explained to the People's Bank of China their ideas about mortgage-backed securities, and requested authorization to launch pilot programs.⁴ The People's Bank of China,

³ Ayotte and Gaon (2005) provide a more detailed explanation of the costs and benefits of bankruptcy remoteness.

⁴ The CCB proposed using the “trust model” to launch an individual mortgage securitization pilot in China, which puts the assets into a “trust,” and CDB proposed drawing upon the experience of

the China Banking Regulatory Commission, and other agencies started to actively research, explore, and evaluate asset securitization.

Because special purpose vehicles (SPV) occupy a core position in the structure of asset securitization transactions and are key to achieving bankruptcy remoteness and tax neutrality, the legal question of what type of SPV to use became central to the initiation of asset securitization in China. Under China's legal framework, especially the Corporate Law, substantial impediments hindered incorporation of special purpose companies. Meanwhile, the Trust Law of the People's Republic of China, Measures for the Administration of Trust Companies, and the Provisional Measures for the Administration of Capital Trusts of Trust Companies issued in 2001 and 2002 have clearly stated principles such as bankruptcy remoteness for trust assets. As such, the special purpose trust became the most feasible option for establishing asset securitization SPVs in China.

In terms of infrastructure, the interbank bond market has developed rapidly since its launch in 1997, and it now exceeds the exchange market as the main trading platform for bonds. The platform is also the closest to international standards for trading asset securitizations. Against this backdrop, a standard ABS model has gradually developed, with bank credit assets used as the underlying assets, special purpose trusts established by trust companies as SPVs, and asset-backed securities issued for trading on the interbank bond market. This model has thus achieved the standard securitization requirements of bankruptcy remoteness and "true sale" (that is, a legal transfer of ownership of underlying assets to the SPV)—a breakthrough in asset securitization in China.

In January 2004, the State Council issued "A Number of Opinions Concerning Promoting Capital Market Reform and Opening and Stabilizing Development," which required "active exploration and development of asset securitization varieties." From April through December of that year, the People's Bank of China and the China Banking Regulatory Commission jointly presented multiple applications for credit asset securitization pilot programs, along with policy design proposals, to the State Council. It recommended the selection of CDB and CCB as China's first pilot banks for initiation of credit asset securitization operations, and the use of the national interbank bond market as the platform for circulation and trading of these credit asset securitizations.

In February 2005, CDB and CCB obtained pilot qualifications and separately initiated pilots in credit asset securitization (specifically, credit loan obligations—namely, enterprise credit asset securitization) and mortgage-backed securities. Also, the State Council clarified that the People's Bank of China would take charge of establishing the Credit Asset Securitization Pilot Coordination Group to ensure that participating government agencies coordinate their actions. The direction of the pilot program was clear, preparations were in order, and there was no turning back from this launch.

the Federal National Mortgage Association (Fannie Mae) in the United States to issue specialized mortgage-backed securities to purchase commercial bank mortgage loans.

In addition, in 2004, the China Securities Regulatory Commission began conducting research and discussing the use of securities companies' special asset management plans as a vehicle for enterprise asset securitization operations. It published the "Notice Concerning Questions Related to the Initiation of an Asset Securitization Operations Pilot by Securities Companies," which set out how securities firms should go about issuing such securitizations. As defined by the China Securities Regulatory Commission, enterprise asset securitization functions as follows: A securities company initiates a special asset management plan as the SPV;⁵ issues asset-backed beneficiary certificates to investors, using the funds from the sale of the certificates to purchase the assets able to generate stable cash flows from the original holder; and then distributes the earnings of these assets to the holders of the beneficiary certificates.

Market Infrastructure and Rating Agencies

In December 1996, the government-owned China Central Depository and Clearing Co. (CCDC) was founded for central registration, custody, and clearing of bonds. This launched the era of paperless bonds in China and established a real-time, gross delivery-versus-payment clearing mechanism using central bank money. This drove a rapid rise in the interbank bond market; substantially increased market efficiency, transparency, and security; and established a firm foundation for the exploration and initiation of asset securitization.

As intermediaries that play an important role in asset securitization operations, China's credit rating agencies formally began to develop in the early 1990s. The successive establishment of mainstream rating agencies, such as Shanghai New Century Investment Services Company, the China Chengxin Securities Rating Co., and Dagong Global Credit Rating, introduced internationally advanced rating methods and concepts and began cooperation with international rating agencies. In December 2004, the People's Bank of China published *Matters Related to the Credit Ratings of Bonds Issued on the Interbank Bond Market*, requiring that, "except for those for which ratings are not required, all institutions intending to issue bonds and all bonds issued on the interbank bond market must have their credit rated by a rating agency domestically registered with the Administration for Industry and Commerce and possessing bond rating capabilities." This successfully established the systematic rating of all credit ABS (except sovereign bonds).

2. Pilots, 2005–08

Guided and driven by the regulatory agencies, China's first asset securitization pilot was launched in 2005 and then expanded from 2006 through 2008, effectively building the market. Under the principle of parallel advancement of the "pilot" and "legislation," an asset securitization policy framework adapted to Chinese national conditions was preliminarily established.

⁵ Despite the publication of the Notice, uncertainties still existed about the legal validity of the special asset management plan as the SPV.

TABLE 8.2.

Regulations Promulgated during the Pilot Launch Phase, 2005–06			
Publication Date	Publishing Agency	Title	Key Points
May 2005	Ministry of Finance	Regulations for the Accounting Treatment of the Credit Asset Securitization Pilot Program	Stipulates the accounting principles for initiating institutions, special purpose trusts, trustees, depository institutions, and loan-service institutions
November 2005	China Banking Regulatory Commission	Administrative Regulations for the Supervision of the Financial Institution Credit Asset Securitization Pilot Program	Stipulates market entrance requirement and procedures for financial institutions to serve as initiating institutions; sets specific operating regulations for financial institutions to participate in securitizations; sets risk control requirements
February 2006	Ministry of Finance, State Administration of Taxation	Notice Concerning Questions of Tax Policy Related to Credit Asset Securitization (referred to as Notice No. 5)	Sets tax policies on stamp tax, business tax, and income tax for credit ABS products, providing preferential tax rate to credit ABS products

Source: Authors.

Note: ABS = asset-backed securities.

Regulatory Framework

In April 2005, the People's Bank of China and the China Banking Regulatory Commission jointly issued the "Administrative Measures for the Credit Asset Securitization Pilot Program," China's first regulatory document formally intended to standardize asset securitization operations, marking the formal launch of the credit asset securitization pilot program. Subsequently, three sets of supporting regulations regarding credit asset securitization operations were successively announced, standardizing accounting treatment, refining regulatory requirements, and clarifying tax incentive policies (Table 8.2).

In January 2007, the People's Bank of China and the China Banking Regulatory Commission jointly submitted the "Request for Instructions Concerning the Steady Expansion of Credit Asset Securitization Pilot Work" and received State Council approval to increase the number of pilot institutions and issue size. Soon thereafter, targeting the issues that arose during the first round of the pilot program, the regulatory agencies improved the institutional setup and successively released three documents to standardize information disclosure, adjust trading liquidity rules, and strengthen checks and risk mitigation and control for underlying assets (Table 8.3), increasing the rigor of the trading structure and the standardization of operations.

TABLE 8.3.

Regulations Promulgated during the Pilot Expansion, 2007–08

Publication Date	Publishing Agency	Title	Key Points
August 2007	People's Bank of China	"Notice Concerning Matters Related to Information Disclosure for the Underlying Asset Pools of Credit Asset Securitizations"	Emphasis on the integrity of information disclosure of the asset pool and the availability of information
August 2007	People's Bank of China	"Operational Rules for Pledge-Style Repurchases of Asset-Backed Securities"	Allows ABS to be pledged in repo agreements to enhance the liquidity of ABS, attracting investors
February 2008	China Banking Regulatory Commission	"Notice Concerning Further Strengthening the Administration of Credit Asset Securitization Operations"	States that only good assets are qualified as underlying assets for ABS; stipulates that financial institutions participating in the pilot programs should make strict capital accruals; control credit risks; prevent operational risks, moral hazard, and legal risks; and should develop the credit ABS business according to their management capabilities

Source: Authors.

Note: ABS = asset-backed securities.

Market Development

During 2005–08, 12 domestic banking institutions issued 19 credit ABS products on the interbank bond market for a total of about RMB 67 billion, and circulation increased progressively each year.⁶

Underlying asset types expanded from general corporate loans and personal mortgage loans at the very beginning to include nonperforming loans, auto loans, and medium- and small-enterprise loans. The number of issuers also increased from the original two banks to include joint-stock commercial banks and automobile financing companies. The pilot program offered the opportunity for asset management companies to gain practical experience to be able to handle asset securitization operations. Investors gradually expanded to include joint-stock commercial banks, city commercial banks, credit cooperatives, finance companies, foreign-owned banks, and securities investment funds. Principal and interest were paid in full for all products issued.

On the exchange markets, the China Unicom CDMA Network Rental Fee Income Plan was established in August 2005, formally launching the pilot program for enterprise asset securitization. Before the pilot was suspended after

⁶ Of this amount, the issue size totaled RMB 7.2 billion in 2005, RMB 11.6 billion in 2006, RMB 17.8 billion in 2007, and had grown to RMB 30.2 billion by 2008.

September 2006, nine enterprise asset securitization products were issued, totaling RMB 26.5 billion.⁷

Market Infrastructure and Rating Agencies

In August 2005, as an issuer and custodian institution of credit ABS, the China Central Depository and Clearing Co. (CCDC) published the *Operational Rules for the Registration, Custody and Clearing of Asset-Backed Securities*, standardizing operations and protecting investor interests. The Central Bonds Integrated Business System successfully supported the issuance and trading of the first batch of ABS, creating supportive conditions for the expansion of the pilot program. In addition, in 2007, the CCDC began publishing China Bond ABS yield curves, which became a benchmark for pricing and aided risk management of the asset securitization market.

For the rating of credit for the first batch of securitization products, CDB retained Fitch Ratings to provide technical support, and CCB retained Moody's and China Chengxin Credit Rating Group to engage in technical cooperation, offering support for the risk evaluation of asset securitization products. An oligopolistic landscape gradually emerged in the domestic rating market, with China Chengxin, China Lianhe Credit Rating Co., and Dagong Global Credit Rating essentially capturing the primary share of the market. In 2006, the People's Bank of China successively published the *People's Bank of China Guiding Opinion on the Administration of Credit Ratings* and *Credit Rating Specifications for the Credit Lending Market and the Interbank Bond Market*, standardizing the operations and administration of rating agencies. In 2007 and 2008, the China Securities Regulatory Commission and the People's Bank of China successively published *Provisional Measures on the Administration of Credit Rating Operations in the Securities Market* and the *Notice Concerning the Strengthening of Interbank Bond Market Credit Rating Operations*, and approved the credit rating agencies that were permitted to engage in credit rating operations in the respective markets.⁸ The improvement and clarity of the policies and the standardization of supervision resulted in the enhancement of credit rating agency credibility.

3. Stagnation, 2009–11

In 2008, the subprime loan crisis in the United States sparked the global financial crisis. To guard against potential financial risks that may also have been present in Chinese securitizations, Chinese financial regulators suspended approval of

⁷ Of this amount, the issue size totaled RMB 10.080 billion in 2005 and RMB 16.421 billion in 2006.

⁸ The China Securities Regulatory Commission approved five securities credit rating agencies: China Chengxin, Shanghai New Century, Pengyuan Credit Rating, Dagong Global Credit Rating, and China Lianhe Credit Rating. The People's Bank of China approved six interbank bond credit rating agencies: China Chengxin, Dagong Global Credit Rating, Shanghai New Century, China Lianhe Credit Rating, Golden Credit Rating International, and China Bond Rating Company.

credit asset securitization products and enterprise asset securitization offerings from 2009 to 2011, and trading in outstanding securities was inactive.

During this period, to build the capacity of the Chinese banking system to withstand financial risk, the China Banking Regulatory Commission published “Guidelines for the Measurement of Regulatory Capital for the Asset Securitization Exposure of Commercial Banks” in February 2010. These required the strengthening of prudential supervision of risk exposure arising from engagement in asset securitization operations and specified that additional provisions be held against the securitization risk exposures.

4. Pilot Program Relaunch, 2012–13

The history of other, foreign financial markets and the earlier practice of China's credit ABS suggested that the emergence of a credit ABS market is a natural development, to be encouraged and nurtured. Hence, in 2012 and 2013, with vigorous policy support, China's asset securitization pilot program was relaunched and expanded, risk controls were strengthened, and market development got back on track.

Regulatory Framework

In May 2012, the People's Bank of China, the China Banking Regulatory Commission, and the Ministry of Finance jointly issued the “Notice Concerning Matters Related to the Further Expansion of the Credit Asset Securitization Pilot Program” (the Notice), which laid out an in-depth and meticulous, principled standardization of the expansion and promotion of the credit asset securitization pilot program. Credit asset securitization operations, which had lain dormant for three and a half years, were relaunched, and the program entered the second round of the pilot phase, with an issuance limit of RMB 50 billion.

In July 2013, the State Council published the *Guiding Opinions Concerning Financial Support for Adjustment, Transformation and Upgrading of the Economic Structure*, clarifying the need to gradually promote the development of credit asset securitization, revitalize funding support for small and micro enterprises, and adjust the economic structure.

In August 2013, the State Council decided to expand the credit asset securitization pilot program, with a firm grounding in strict risk control. The third round of the pilot program was launched, and the total issuance limit was increased to RMB 400 billion.

Notably, after the financial crisis, financial regulatory agencies in Europe and the United States successively introduced policies requiring entities engaged in asset securitization to bring their interests in line with those of investors. This offered Chinese regulators a reference point and empirical lessons in their formulation of asset securitization risk-prevention policies. In December 2013, the People's Bank of China and the China Banking Regulatory Commission jointly issued the “Announcement Concerning Further Standardization of the Risk Retention Conduct of Asset Securitization Originating Institutions,” requiring a risk-retention ratio of no less than 5 percent of the size of an individual product

for credit asset securitization, while the retention ratio for the lowest-rated products (or tranches) within an overall securitization must also not be less than 5 percent of the issue size of the lowest-rated products, topping up the overall retention. This requirement firmly established a rational risk benchmark for credit asset securitization, and represented a balancing of incentives regarding retention requirements set forth in the Notice.⁹ By requiring significant ownership of the lower-rated products, the Notice aimed to effectively control risk by providing an incentive to carefully oversee the credit quality of the riskiest assets, without the retention requirement being so high as to discourage issuance entirely.

On the exchange market, in May 2009, the China Securities Regulatory Commission published the “Letter Reporting the Status of the Securities Company Enterprise Asset Securitization Operations Pilot Program” and the “Guidelines for the Securities Company Enterprise Asset Securitization Operations Pilot Program (Provisional)” to relaunch the pilot program. In March 2013, the China Securities Regulatory Commission published the “Administrative Regulations for Securities Company Asset Securitization Operations,” and enterprise asset securitization began the shift from pilot program to regular, ongoing operations.

In addition, in August 2012, the National Association of Financial Market Institutional Investors published *Guidelines for Asset-Backed Notes of Non-Financial Enterprises on the Interbank Bond Market*. China’s third major category of asset securitization products—the nonfinancial enterprise asset-backed note, or ABN—was formally introduced.

Market Development

On September 7, 2012, CDB issued about RMB 102 billion in “Kaiyuan 2002 Phase 1 Credit Asset-Backed Securities,” which marked the relaunch of asset securitization operations, and became the first credit asset securitization product on the scale of RMB 10.0 billion. In 2012 and 2013, RMB 35.0 billion in credit asset securitization products were issued. A total of RMB 10.5 billion in ABNs, the new variety on the interbank bond market, was issued during this period.

On the exchange market, CITIC Securities issued the “Far East Phase 2 Special Asset Management Plan” in September 2011, marking the relaunch of the enterprise asset securitization market; by the end of 2013, a total of 11 enterprise asset-backed special plans had been issued, totaling RMB 11.856 billion.

Market Infrastructure and Rating Agencies

In July 2012, the Shanghai Clearing House published the *Announcement Concerning Registration, Custody, and Clearing Operations for Credit Asset-Backed Securities*, and began to offer credit ABS registration, custody, and clearing

⁹ The Notice required originating institutions to hold a certain proportion of the lowest-rated ABS for each asset securitization product issued; in principle, this proportion was not to be less than 5 percent of the entire ABS issue size for a single issue.

services. From the perspective of actual operations, services have been primarily offered on the personal housing provident fund ABS and fixed income, privately placed real estate investment trust (REIT) products—so-called quasi-REITs—that have existed since 2015.

Moreover, according to the requirements of the Notice, credit ABS should be subject to ongoing credit rating evaluation by two qualified credit rating agencies. The introduction of the “double rating” system is meant to serve as a double check, offering investors more reference information and encouraging rating agencies to continually standardize their ratings, playing a positive role in the full disclosure of credit risk and protection of investor interests.

5. Normalized Development Phase, 2014 to Present

At the end of 2014, with the improvement of system design, simplification of issuance procedures, and strengthened information disclosure and risk management, China's asset securitization market formally entered a phase of regular development, and rapid market growth has continued.

System Construction and Policy Announcements

After March 2014, with the fall of interest rates, the enthusiasm of asset securitization continued to increase. However, due to the long process required for regulatory risk verification and approval, market participants missed a window of opportunity to issue new securities and faced additional issuance cost pressures. To solve this problem, at the end of 2014, the regulation of China's asset securitization operations reached a major turning point, shifting from a transaction-based review and approval system to a filing system.

With this change, a “filing + registration system” was set in place for credit asset securitization. The China Banking Regulatory Commission published the *Notice Concerning the Work Flow for Filing and Registration of Credit Asset Securitization* in November 2014 and approved qualifications for 27 commercial banks to engage in credit asset securitization operations in January 2015. In April 2015, the People's Bank of China published its *2015 Announcement No. 7*. This clarified that trustee institutions and originating institutions that had already obtained the relevant operating qualifications from regulatory agencies, had issued credit ABS, and were able to disclose information according to requirements were permitted to apply to the central bank to register, and would be permitted to issue credit ABS during the registration validity period without needing to obtain a review for each security.

A “approval system + Negative List management” is in place for enterprise asset securitization.¹⁰ In November 2014, the China Securities Regulatory Commission

¹⁰ Credit ABS are issued on the interbank market. To issue Credit ABS products, issuers should first complete the filing process of the product at CBIRC, and then register at PBC before issuing. Enterprise ABS are issued on the exchange market. To issue Enterprise ABS, issuers should seek the approval from the Exchange, provided that the products are not listed on the Negative List released

published the *Regulations for the Administration of Asset Securitization Operations of Securities Companies and Subsidiaries of Fund Management Companies* (Document No. 49) and supporting guidelines,¹¹ formally launching the enterprise ABS filing system, clarifying the legal status of special asset management plans as bankruptcy remote SPVs, and expanding the scope of operating entities and underlying assets.

Since 2015, improvements in the system construction of the asset securitization market have accelerated. First, strengthening of information disclosure has continued. To enhance the efficiency of issuance regulation and registration, increase market transparency, and promote the development of the credit ABS market, the National Association of Financial Market Institutional Investors has actively set up information disclosure guidelines for credit ABS products. It has published information disclosure guidelines (provisional) for asset-backed securities for personal mortgages, personal auto loans, shantytown renovation project loans, personal consumer loans, nonperforming loans, and small- and medium-sized enterprise loans in the “Procedures for the Assessment of Information Disclosure Work for Credit Asset-Backed Securities (Draft for Comment).”

Second, the pace of operational innovations has accelerated. In 2015, housing provident fund asset securitization was introduced. In 2016, the pilot program for nonperforming asset securitization was relaunched, and green asset securitization was promoted. In 2017, the scope of participants in the nonperforming asset securitization pilot was expanded.

That same year, the Ministry of Finance, the People’s Bank of China, and the China Securities Regulatory Commission published the “Notice Concerning Matters Related to the Standardization and Initiation of Asset Securitization of Public-Private Partnerships.” And nine ministries and commissions—including the Ministry of Housing and Urban-Rural Development, the National Development and Reform Commission, the Ministry of Finance, the People’s Bank of China, and the China Securities Regulatory Commission—jointly published the “Notice Concerning Accelerating the Development of the Residential Leasing Market in Large and Medium-Sized Cities with Net Population Inflows,” which respectively vigorously promoted the development of public-private partnership (PPP) asset securitization and REITs.

Third, exchange operating rules have been continually improved. The Shanghai and Shenzhen Stock Exchanges successively published the “Guidelines for Asset Securitization Operations,” the “Guidelines for the Confirmation of Listing Conditions for Asset-Backed Securities,” the “Guidelines for the Credit Risk Management of Outstanding Asset-Backed Securities (Provisional),” and the “Guidelines for the Content and Format of Periodic Reports for Asset-Backed Securities,” increasing operating efficiency. In addition, in August 2015, the China Insurance Regulatory Commission printed and distributed “Provisional

by the Asset Management Association of China (AMAC).

¹¹ Information Disclosure Guidelines for Asset Securitization Operations of Securities Companies and Subsidiaries of Fund Management Companies and Due Diligence Guidelines for Asset Securitization Operations of Securities Companies and Subsidiaries of Fund Management Companies.

Measures for the Administration of Asset-Backed Plans,” which clarified appropriate trading structures for the securitizations and administrative specifications for asset-backed plans.

Market Development

Driven by registration systems, credit asset securitization exploded in 2014, with 66 individual products issued and aggregate issues totaling nearly RMB 282 billion; this exceeded the aggregate amount issued from 2005 through 2013, and the momentum of rapid expansion has continued since 2015. Enterprise asset securitization accelerated substantially in 2015, and growth in issuance volume was vigorous in 2016 and 2017, with issuance and circulation volumes surpassing those of credit ABS for the first time in 2017. The issue size for asset securitization products as a whole in 2017 totaled RMB 1.45 trillion, and the outstanding balance at the end of the year broke the significant RMB 2.00 trillion benchmark (reaching RMB 2.08 trillion) (Figure 8.3).

Concurrent with market growth, operational innovations advanced, playing important roles in supporting the transformation of economic structure and aiding development of inclusive finance. These innovations included continual enrichment of the types of underlying assets used for credit asset securitization, with the gradual introduction of consumer loans, credit card loans, and nonperforming loans. In 2017, the first interbank quasi-REIT product was issued; the structure of underlying assets shifted from one of dominance by collateralized loan obligations toward greater balance, and further evolved to put household residential mortgage-backed securitizations strongly in the lead (Figure 8.4).

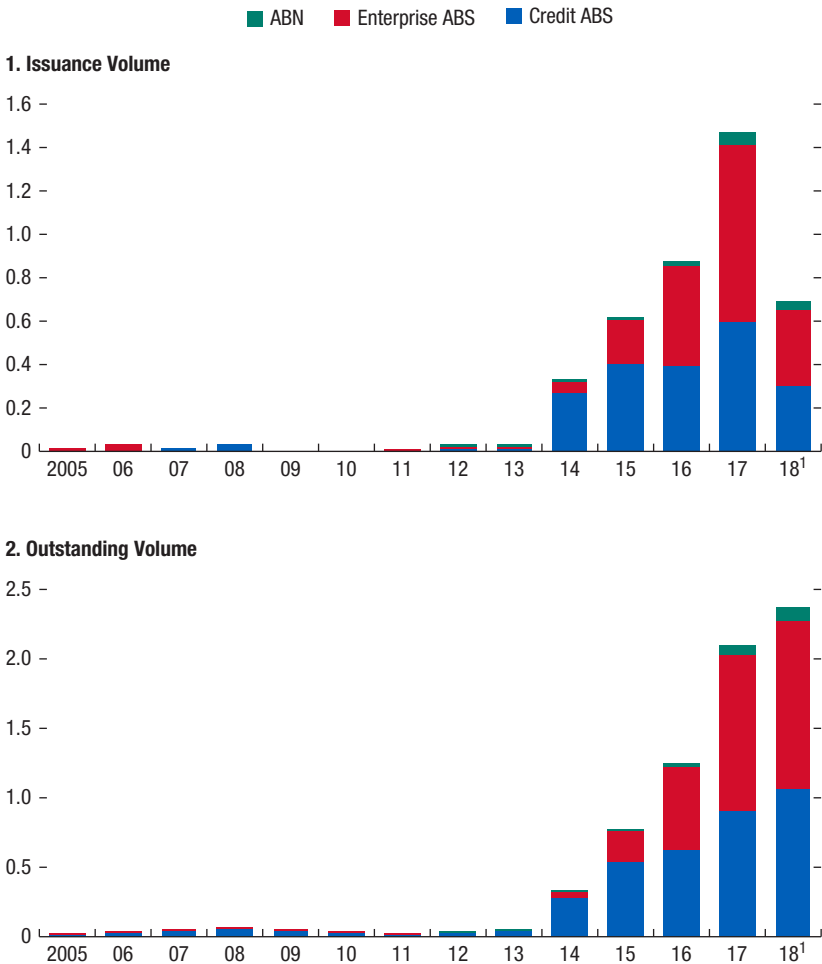
In addition, originating institutions of credit asset securitization have expanded from the traditional large, state-owned banks to include city commercial banks, rural commercial banks, and financial leasing companies.¹² On the investor side, foreign investors have been introduced as investment principals via Bond Connect. The Negative List management mechanism has been adapted for enterprise asset securitization, resulting in a diversification of underlying assets (Figure 8.5), which have expanded to include public-private partnership projects, commercial mortgages, entrusted loans, and REITs, with innovative products coming one after the other.

Infrastructure and Intermediary Institutions

Following the revitalization of asset securitization, secondary market activity and investment demand have both heated up significantly. To objectively reflect price changes for ABS on the secondary market and provide investors with more performance benchmarks and investment targets, on July 20, 2016, the CCDC published China's first ABS index, the ChinaBond Interbank Asset-Backed

¹² Including the Fuyuan 2017 Phase 2 Personal Auto Loan Asset-Backed Securities issued by Ford Automotive Finance (China) Limited in August 2017, and the Xingyuan 2018 Phase 1 Personal Residential Mortgage Asset-Backed Securities issued by Industrial Bank in April 2018.

Figure 8.3. Issuance Volume and Outstanding Volume on the Asset Securitization Market, 2005–18
(Trillions of renminbi)



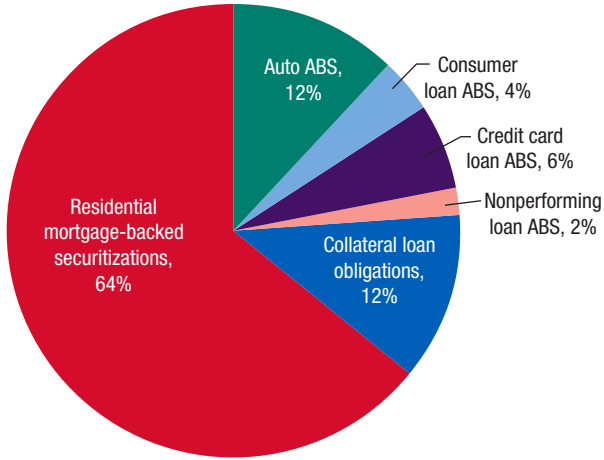
Sources: China Central Depository and Clearing Corporation Limited; and WIND Economic Database (www.wind.com.cn).

Note: ABN = asset-backed notes for nonfinancial enterprises; ABS = asset-backed securities.

¹ Data for 2018 are from January through July.

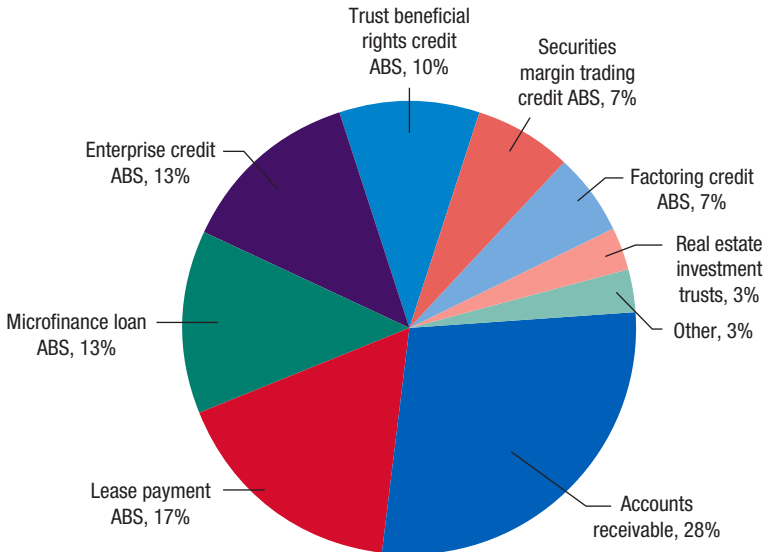
Securities Index. Asset-backed notes were incorporated into this index beginning on September 29, 2017.

At the same time, the external ratings for asset securitization have become increasingly sophisticated, rating agencies have improved their operating standards through practical operating experience and international cooperation, and

Figure 8.4. Structure of Credit ABS Products Issued in the First Half of 2018

Sources: China Central Depository and Clearing Corporation Limited; and WIND Economic Database (www.wind.com.cn).

Note: ABS = asset-based securities.

Figure 8.5. Structure of Enterprise ABS Products Issued in the First Half of 2018

Sources: China Central Depository and Clearing Corporation Limited; WIND Economic Database (www.wind.com.cn).

Note: ABS = asset-based securities.

credit ratings are playing an increasingly important role in the areas of risk disclosure and market discipline. In 2017, the People's Bank of China published "Announcement No. 7," clarifying that qualifying foreign-owned rating agencies could initiate credit rating operations on the interbank bond market, which will likely bring further improvements in the fairness, professionalism, and level of internationalization of credit rating agencies in China.

AREAS FOR IMPROVEMENT

Imperfections Remain in the Legal System

A sound legal system forms the foundation for market development. Compared to mature markets internationally, China's asset securitization market lacks the standardization of comprehensive, specialized top-level laws, which increases the likelihood of disputes and legal risk. For example, despite several attempts at regulatory rulemaking, the formal legal status of the SPV is not clearly defined; this leads directly to difficulties for tax authorities in identifying the taxpayer status of SPVs and has an impact on the implementation of tax neutrality.

At the same time, defects and loopholes exist in the regulatory framework of enterprise asset securitization in the areas of bankruptcy remoteness and tax neutrality. First, "Document No. 49" clarified the bankruptcy remoteness function of special asset management plans, but it is only a departmental normative document. It has relatively low-level legal effect, and the corresponding higher law, the Securities Investment Fund Law, only clarifies that securities investment funds have bankruptcy remoteness similar to those of trusts. However, it does not incorporate special asset management plans into the scope of legislation, resulting in uncertainty regarding the bankruptcy remoteness of enterprise asset securitization on the higher legal level. Second, no special tax regulations exist for enterprise asset securitization, so that one can only refer to "Document No. 5" for credit asset securitization, requiring a great deal of communication and coordination with tax authorities; this increases the difficulty of advancing operations, which has an impact on the enthusiasm of market principals to participate.

Liquidity in the Secondary Market Is Low

The problem of severely inadequate secondary market liquidity in the asset securitization market became apparent by the time the pilot program was launched. Since the market entered its more recent phase of revitalization, trading activity has increased (Table 8.4), but turnover remains markedly lower than the overall level on the bond market. Taking the example of credit ABS entrusted to the custody of the CCDC, turnover rates in 2015 through 2017 were 7 percent, 25 percent, and 16 percent, respectively, while turnover rates for the bond market as a whole were 173 percent, 188 percent, and 102 percent, respectively. While low secondary market liquidity is not unusual in other countries, especially for highly specialized or complex structures, inadequate liquidity has become a key

TABLE 8.4.

Trading Volumes on Asset-Backed Securities Settled by the China Central Depository and Clearing Company, 2014–18

(Billions of renminbi)

Year	Trading Volume
2014	2.10
2015	39.43
2016	143.53
2017	139.10
2018 ¹	116.51

Source: China Central Depository and Clearing Co., Ltd.

¹ Data for 2018 are from January through July.

problem that limits the depth of China's asset securitization market, and identifying the underlying reasons is urgently needed so that any regulatory hurdles that may be inhibiting market liquidity can be removed.

Information Disclosure Remains Inadequate

At present, the information disclosure system for credit asset securitization is relatively complete, but the information disclosure framework for enterprise asset securitization on the exchange markets remains relatively general, with insufficient granularity to accommodate the information needs of investors in the major categories of assets underlying these securitizations.

In addition, a substantial gap exists between the strictness of information disclosure for asset securitization in China and that in the United States and other mature markets. For example, China has no explicit requirements for disclosure according to individual underlying assets; disclosures at the time of issue are relatively complete, but ongoing disclosures are insufficiently detailed; and the level of standardization of information disclosures is inadequate, making it difficult for investors to systematically analyze underlying asset information, impeding the timely mitigation and control of risk.

Rating Capabilities Need to Be Enhanced

Good credit ratings are an important reference for the pricing of ABS and a key basis for investor decision making. China's rating agencies have not had long to develop, and the rating system is not yet sound.¹³ Asset securitization operations were initiated relatively recently, so that substantial gaps remain in such areas as management experience, data accumulation, and market practices when compared with more advanced rating agencies in the international arena. Professionalism, standardization, and transparency all need improvement. The

¹³ Chinese rating agencies have not yet been evaluated relative to the International Organization of Securities Commissions' code of conduct for credit ratings—a global standard for credit rating agencies.

rapid development of the asset securitization market and the opening of the interbank bond market to foreign-owned rating agencies have also demanded greater professionalism and service quality from Chinese rating agencies.

Markets Are Segmented and Registration Is Decentralized

China's asset securitization market is divided into the interbank and the exchange markets, which operate independently of each other and have different product structures, regulatory policies, participants, and trading methods. Not only is market segmentation detrimental to the development of one of the core advantages of asset securitization—risk diversification—but it also distorts market pricing and can give rise to regulatory loopholes and regulatory arbitrage.

The problem of registration of products of the same type on different platforms and clearing facilities is also rooted in this market segmentation. For example, bank credit ABS are issued and traded on the interbank market and registered and cleared through the CCDC, but the underlying assets for asset securitization products belonging to other credit categories of entrusted loans, internet loans, and microfinance loans are issued and traded on the exchange market and registered and cleared through the China Securities Depository and Clearing Corporation, a situation that is not conducive to market monitoring and risk control.

Risk Events of Enterprise ABS Are Increasing

Since the launch of the pilot program, credit ABS have experienced only one credit downgrade and have had more upgrades compared to enterprise ABS. In contrast, credit events of enterprise ABS have been increasing (Table 8.5).

The first ABS default took place in 2016 when the Special Asset Management Plan for Toll Income Claim of Dacheng West Yellow River Bridge did not repay on time. In April 2018, the Special Asset-Backed Plan for Qinghui Leasing I defaulted on an interest payment. In 2017, three enterprise ABS were downgraded, all due to imperfections in cash collection management, trading structure design, or other management problems following issuance, rather than a deterioration in underlying assets. From January to the end of July 2018, 26 enterprise ABS from seven projects were downgraded, all due to lower-than-expected underlying asset performance and operational risks of initiators, indicating that the tightening regulations made ABS managers more accountable for their duties.

Based on the preceding analysis, two major reasons for the increasing of enterprise ABS risk events can be summarized. First, ABS issuance adopts Negative List regulations, which leads to less standardized products as new asset types and new firms are removed from the list. With market volume rapidly increasing, more types of underlying assets have emerged while underwriting standards have deteriorated. ABS managers of differing quality also rushed to the market, resulting in low underlying asset management experience, improper cash collection designs, and even embezzlement from supervised accounts. Second, cash flows from fee or toll claims largely rely on the ability of their initial equity holders to continually operate. Therefore, it is hard to ensure bankruptcy remoteness for

TABLE 8.5.

Rating Shifts after ABS Issuance, 2008–18				
Year	Credit ABS		Enterprise ABS	
	Upgrade	Downgrade	Upgrade	Downgrade
2008	1	0	0	0
2009	3	0	0	0
2010	7	0	0	0
2011	1	0	0	0
2012	3	0	0	0
2013	16	0	0	0
2014	23	0	0	0
2015	113	0	2	5
2016	107	1	16	8
2017	118	0	104	7
2018 ¹	128	0	150	26

Source: WIND Economic Database (www.wind.com.cn).

Note: ABS = asset-backed securities.

¹Data for 2018 are from January through July.

ABS with these types of cash flows as underlying assets. When initiators encounter difficulties in operations or a liquidity crisis, these ABS products could face heightened risk exposures.

OUTLOOK AND RECOMMENDATIONS

As China's financial reforms and its economic structural transformation deepen, continuing to press ahead with the development of the asset securitization market will have important practical significance. The asset securitization market is expected to enjoy a favorable policy environment; in particular, the policy advantages enjoyed by operations in such areas as nonperforming asset securitization, public-private partnership asset securitization, and residential lease asset securitization will usher in substantial development. But the large volume of outstanding assets in urgent need of restructuring, the urgent demands to move bank assets from balance sheets and provide enterprise financing, and a higher level of investor acceptance have converged to form the foundation for continuing rapid development of the asset securitization market. In the next phase, it is recommended that improvements in system design be accelerated in the following areas, to resolve existing problems and promote market maturity.¹⁴

Strengthen Institutions and System of Laws

- First, press ahead with specialized legislation for asset securitization to build a comprehensive top-level legal framework and standardize, identify, and protect each link in the asset securitization trading process.

¹⁴ See IMF (2009) for a review of pitfalls that led to the fall in securitization in the United States and policy change to restart these markets on a sounder footing.

- Second, amend and improve existing regulations that impede the development of securitization. In particular, clarify the legal status of the various types of SPVs in the market to remedy legal loopholes in such areas as bankruptcy remoteness, true sale, and tax neutrality and to offer greater certainty regarding the design of asset securitization.
- Third, study and introduce fair tax policies for enterprise asset securitization and resolve the problems of double taxation and the lack of legal basis.
- Fourth, encourage the use of mortgage electronic registration systems as is done abroad, integrating China-specific requirements so that the national financial infrastructure can establish a centralized credit mortgage registration mechanism for registration of ownership, reducing legal risk and simplifying operating procedures.

Increase Secondary Market Liquidity

- First, make asset securitization products more attractive to investors through such means as lowering any regulation-induced issuance costs and allowing trading mechanisms for pledge-style repurchases of ABS.
- Second, expand market maker mechanisms; introduce specific regulations and operating guidelines for the operations of ABS market makers to increase trading efficiency; and stimulate the secondary market.
- Third, improve the valuation system for asset securitization products and promote improvements in the asset securitization yield curve and the establishment of price discovery mechanisms to strengthen links between the primary and secondary markets.
- Fourth, promote diversification of investor principals by encouraging insurance companies, asset management companies, various types of funds, and a greater number of transactional financial institutions to enter the asset securitization market to stimulate the market.

Comprehensively Strengthen Information Disclosure

- First, comprehensively increase the transparency and timeliness of information disclosure for asset securitization products by increasing the frequency of disclosure, formulating more meticulous and specific information disclosure requirements, and strengthening ongoing information disclosures.
- Second, in keeping with the general direction of information disclosures for asset securitization, adopt transaction-based disclosure for major categories of underlying assets, while also refining the information disclosure requirements for innovative products, to provide investors and regulators with ample and effective decision-making information and guard against potential unrecognized risk.

- Third, increase normalization, standardization, and machine-readability of information disclosures to satisfy query and analysis requirements of third-party valuation institutions and promote information symmetry.

Improve Credit Rating Standards

- First, strengthen government supervision and self-regulation of credit rating agencies and standardize the operations of rating agencies; ensure the independence of credit rating agencies, the analytical clarity of rating methods, and the fairness of rating results; and establish an accountability system to clarify the responsibilities that rating agencies should assume for the ratings they provide. Encourage the adoption of the International Organization of Securities Commissions credit rating agency code of conduct (IOSCO 2008).
- Second, guide rating agencies to study mature technologies abroad and apply them in accordance with national conditions in China. Promote innovative thinking and technological advances to improve rating accuracy, which will in turn increase the international influence and acceptance of domestic rating institutions.

Promote Interconnection and Interoperability of Markets

- First, promote the circulation of asset securitization products in both the interbank market and the exchange market by improving policies related to cross-market issuance, custody transfers, and trade transfers to attain the coordinated development and complementary advantages of the two market systems and mitigate the abuses brought about by market segmentation.
- Second, in keeping with market development patterns and international trends, explore ways to advance centralization and integration of the custody and clearing infrastructure and achieve interconnection and interoperability of the interbank and exchange markets through integration in back-office procedures to increase the effectiveness, transparency, and risk control in the asset securitization market.
- Third, centralize registration and standardize information disclosure requirements for entrusted loan, internet loan, and microfinance loan asset-backed securities to realize better overall supervision and promote steady development of these credit asset securitization products.

Strengthen Risk Identification and Control

- First, clarify the qualified types of securitized assets and structures to avoid deviating from the benefits they bring to the real economy and triggering market risks as the result of “over-securitization” of assets; monitor the structural design of products so that the underlying assets are of high credit

quality to ensure healthy development of the market and appropriate pricing of their risks.

- Second, strengthen full-process risk identification and management, including prudently grasping the risks originating from underlying assets, improving internal and external credit enhancement mechanisms, strengthening project information disclosures and follow-up management, supervising the due diligence of intermediary institutions, implementing investor protection clauses, increasing the risk awareness of investors, and fostering a sophisticated market opinion environment.
- Third, encourage the application of advanced technology to manage asset securitization risk, for example, by further studying and enriching risk hedging instruments, continually improving market risk indicators and risk-forecasting models, and strengthening the identification and dynamic measurement of credit risk.
- Fourth, enhance macroprudential regulation with the asset securitization market in mind. As the global financial crisis has shown, many microprudential regulations do not take into account systemic risks. The financial sector and the real sector could be more vulnerable to the increasing interconnectedness of markets, including through securitization channels. Certain macroprudential indicators thus could be considered when monitoring the risks in the asset securitization market. In particular, early warning mechanisms should be established to tackle credit quality deterioration and funding liquidity risks at an early stage.

CONCLUSIONS

In addition to its credit bonds, a market for ABS has emerged in China. Since the 1990s, the country's financial institutions and regulatory agencies have actively studied asset-backed securitization. Pilot projects were formally launched in 2005. While the market expanded in the subsequent three years, in light of the global financial crisis, market activity was suspended in 2009. It was only in 2012 that pilots resumed, and new rules and regulations were introduced (such as dual-rating requirements) to strengthen risk control. At the end of 2014, the issuance of ABS changed from an approval-based to a registration-based system. Since then, the market has entered a new stage of development and has grown rapidly.

The types of underlying assets have been expanded and the pool of investors has grown increasingly diverse. The market now plays an important role in serving the real economy, reviving illiquid assets, and promoting inclusive finance. Nevertheless, the market still has a lot of room to develop, given the large size of the country's bank credit assets, strong corporate financing needs, and a supportive policy environment.

Compared with mature markets in countries such as the United States, ABS have had a late start and important areas remain to be developed. Apart from the need to strengthen legal frameworks to close loopholes, market liquidity needs to be increased by promoting market makers and product valuation systems and expanding the diversity of investors. Information disclosure should also be strengthened comprehensively to improve transparency, timeliness, and standardization. At the same time, rating agencies should strengthen self-discipline, standardize rating operations, and improve rating capacity; and the coordination and integration of custody and settlement infrastructures should be explored to promote efficient market interconnectivity.

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PART III

Reforming China's Bond Market

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Opening Up China's Bond Market: Some Considerations

GUO Kai

In 2016, the renminbi (RMB) was formally added to the basket of major currencies in the special drawing rights (SDR), the supplementary foreign exchange reserve assets defined and maintained by the International Monetary Fund. During the process to fulfill the basic requirements of the RMB as an SDR basket currency, the China Interbank Bond Market (CIBM) was further developed. However, a big gap remains in the depth and breadth of the bond market in China compared with that of major reserve-currency-issuing countries. China needs to further develop, open up, and improve the quality of the bond market not only to maintain financial stability as an emerging market, optimize resource allocation, deepen the financial market, and promote economic development but also to meet the need for the RMB to become a major reserve currency.

This chapter first presents an overview of the current conditions of the bond market in China, and then analyzes some of the issues and problems present in China's bond market from perspectives such as market accessibility, liquidity, hedging, the custodian and clearing system, convenience and information availability, supporting systems, and cross-border capital flow management. It concludes with policy recommendations.

CURRENT CONDITIONS OF CHINA'S BOND MARKET

China's bond market has developed rapidly and gradually matured in the process of reforming and opening up the economy. The size of the market has grown continuously, playing an important role in improving yield curves, promoting direct financing, and maintaining financial stability. Given that the RMB is already the third-largest trade financing currency, the fifth-largest payment currency, and an SDR basket currency, foreign investors' demand for RMB bonds will continue to grow as the RMB bond market continues to open up in the process of internationalization.

In recent years, reforms have taken place in a few key areas to promote the opening up of the bond market.

In 2005, the panda bond market was launched. Panda bonds are Chinese renminbi-denominated bonds from a non-Chinese issuer, sold in the People's Republic of China. The International Finance Corporation and the Asian Development Bank issued the first panda bonds, valued at RMB 4 billion. But the panda bond market was small in its early stage of development, largely due to strict restrictions imposed on issuers and usage of funds. In 2010, the People's Bank of China, along with the Ministry of Finance, National Development and Reform Commission, and China Securities Regulatory Commission, jointly amended the rules and regulations, lifting a few restrictions on the issuance of panda bonds and paving the way for their further development. In 2013, Daimler became the first nonfinancial institution to issue a panda bond, selling a RMB 5 billion bond to Chinese investors. Growth picked up starting in 2015. In 2015 HSBC was approved to issue panda bonds, and international commercial banks became another major type of issuer besides international development institutions and foreign nonfinancial companies. In 2015 and 2016, Korea and British Columbia, Canada, issued the first sovereign and quasi-sovereign panda bonds, valued at RMB 9 billion. In August 2016, the World Bank successfully issued the first SDR-denominated bond in CIBM, which settles in RMB, further enhancing China's bond products and expanding the use of the SDR. The scale of RMB bonds issued in China by foreign entities has also grown quickly over the past several years. By the end of 2017, the total amount of panda bonds issued in the CIBM had reached RMB 123.4 billion.

The scope of foreign investors and transactions they can conduct in the bond market continues to expand, making the bond market the most open submarket among all Chinese financial markets. With more frequent and larger scale use of RMB in cross-border activities, foreign investors' demand for RMB-denominated assets, especially for fixed income assets, is gradually rising. At the same time, the People's Bank of China has also deployed a series of policies to facilitate investment in China's bond market. In 2010, the People's Bank of China allowed foreign central banks, the RMB clearing banks in Hong Kong SAR and Macau SAR,¹ and overseas participating banks to invest in the interbank bond market up to an approved amount. In 2013, Qualified Foreign Institutional Investors (QFII) and Renminbi Qualified Foreign Institutional Investors (RQFII) were allowed to trade bonds in China. In 2015, in order to fulfill the requirements for RMB as an SDR basket currency, the People's Bank of China allowed full and more convenient access to the bond market by foreign central banks and reserve managers, including simplifying the account opening process, lifting quota limitations, moving to a filing system from an approval system, and expanding the scope of investment and transactions to bonds, bond repurchases, bond lending, forwards, and interest rate swaps. In 2016, the People's Bank of China further enlarged the scope of investors to almost all foreign institutional investors. Hence,

¹ The RMB clearing banks in Hong Kong SAR and Macau SAR are the Hong Kong SAR and Macau SAR branches of the Bank of China.

the secondary market of the bond market has effectively opened to foreign institutional investors.

In May 2017, Bond Connect (between the onshore bond market and Hong Kong SAR) was formally launched. Northbound trading (from Hong Kong SAR to mainland China) commenced in the initial phase, allowing overseas investors from Hong Kong SAR and other regions to invest in the CIBM through a mutual access arrangement. Southbound trading (from mainland China to Hong Kong SAR) will be explored at a later stage to allow investors from domestic China to invest in overseas bond markets.² Bond Connect provides familiar interfaces to international investors who want to invest in China's bond market without having to navigate the Chinese system. In particular, Bond Connect allows for a multitier custodian system and serves as yet another step to opening up China's bond market. Under the current single-tier custodian system, all international investors must open accounts under their own names in China's central depository, resulting in high entry costs and low efficiency. The implementation of the multitier custodian system is an innovation of Bond Connect and one of its primary purposes. Bond Connect establishes a channel between the mainland and Hong Kong SAR in line with international practices, so that international investors can purchase RMB bonds from overseas basically without changing custodians, clearing and settlement arrangements, and trading practices.

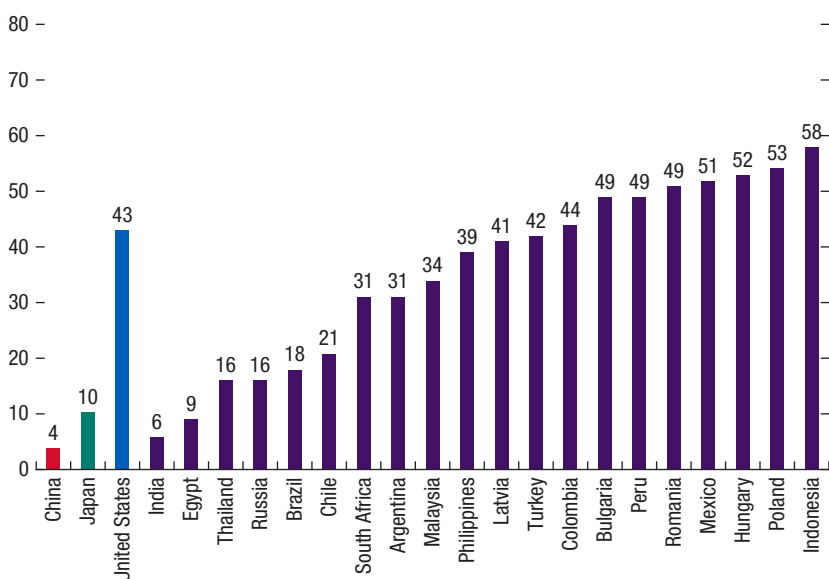
As the bond market has become more open, index providers have started to consider including RMB bonds in global bond indices. In March 2017 Bloomberg published a new index that includes China's government bonds and policy bank bonds. Citigroup also announced that it is considering adding China's bond market to its emerging market and regional government bond indices in 2017.³

In terms of demand for RMB bonds as official reserves, if RMB-denominated reserves reach the level of Australian dollar-denominated reserves, we estimate that approximately US\$65 billion more would flow into RMB assets. Assuming that investment in the bond market accounts for 70 percent of inflows, demand for RMB bonds would increase by RMB 300 billion. If RMB-denominated reserves further reach the level of British pound-denominated reserves, then funds flowing into RMB bonds would reach around RMB 1.5 trillion. Private sector demand for RMB assets would be even greater. The total amount of bond investment by international investors in emerging markets is approximately \$2.8 trillion. Some analysts estimate that RMB bonds would have a weight of approximately one-third if included in major emerging market bond indices (IMF 2016). Therefore, in an optimistic scenario, inclusion in those indices would result in approximately RMB 6 trillion of capital inflow. Taken together, in the medium to long term, the international community's demand for RMB

² Bond Connect, <http://www.chinabondconnect.com/en/>.

³ See HKEX (2017).

Figure 9.1. Participation by Foreign Investors in the Sovereign Bond Markets of China, the United States, Japan, and Major Emerging Market Economies (Percent)



Source: Hong Kong Exchanges and Clearing Limited 2017.

bonds could reach RMB 6.3 trillion to RMB 7.4 trillion, representing approximately 11 percent to 13 percent of China's total bond market.

However, the degree of openness of the bond market in China is not yet comparable to that of other major developed markets and many emerging market economies. According to statistics from ChinaBond, by the end of 2016, the proportion of China's bonds held by foreign investors was only 2.52 percent and the share of China's sovereign bonds held was only 3.93 percent (Figure 9.1). By contrast, the proportion of bonds held by international investors (that is, sovereign and nonsovereign bonds) in developed markets such as the United States and Europe is approximately 30–40 percent, and the proportion held by international investors in emerging bond markets such as Malaysia and Russia is also in excess of 10 percent (HUANG 2018).

Furthermore, although China's bond market is being considered for inclusion in major global bond indices, it is not yet included in the core indices broadly used by international investors, such as the Bloomberg Barclays Global Aggregate Bond Index, the Citigroup World Government Bond Index (WGBI), and the JPMorgan Government Bond Index-Emerging Markets (JPM GBI-EM). This reflects the remaining concerns by global investors about China's bond market.

ISSUES FACING THE RMB BOND MARKET

Further development of the RMB bond market is necessary not only for China's own need to lessen currency mismatches, minimize disorderly cross-border capital flows, and maintain financial stability as an emerging market economy, but is inevitable if the renminbi is to become a major reserve currency.

Market Access

The issuance of panda bonds and investing in the Shanghai Stock Exchange and the Shenzhen Stock Exchange still need approval by the China Securities Regulatory Commission. While investing in the CIBM only requires filing, completing the filing process and opening accounts is quite time-consuming and cumbersome. Foreign institutions need to provide many documents, and some institutions, such as ChinaBond and Shanghai Clearing House, require clients to submit documents in paper (hard copy) form. It typically takes several months to complete all pretransaction procedures; some institutions need six to nine months to open an account. Convenience in filing and account-opening procedures still needs to be improved.

Various restrictions remain on specific types of bond transactions for foreign investors. First, although foreign institutional investors have access to bond borrowing and lending, forwards, and interest rate swaps, they can only conduct such transactions if they can prove there are underlying risks to manage. While the intention is to limit arbitrage or speculation, such requirements severely constrain investors' participation in these transactions. Second, while bond repurchase (repo) is an important type of bond transaction and money market instrument, only foreign central banks, clearing banks, and overseas participating banks are allowed to enter the repo market; other institutional investors are not permitted to do so. Third, foreign investors are not allowed to trade Chinese government bond futures and therefore cannot fully manage investment risk.

Market Liquidity and Risk Hedging

Similar to other Asian local currency bond markets, China's bond market still lacks liquidity and market depth, as demonstrated by the relatively high bid-ask spreads. Market liquidity is concentrated in newly issued bonds, and the Chinese government bond bid-ask spread is still larger than that in mature markets. For instance, bid-ask spreads are typically four basis points for newly issued (on-the-run) Treasury bonds and around seven basis points for older (off-the-run) Treasury bonds, while the spreads are as low as one basis point in mature markets. Furthermore, lack of liquidity sometimes can make it difficult to find a proper counterparty in specific transactions and thus the order cannot be fulfilled. Possible reasons for relatively low liquidity include the following: First, commercial banks dominate China's bond market, holding more than 65 percent of government bonds and 70 percent of policy bank bonds. They prefer to hold bonds to maturity; thus, a large share of bonds is not traded in the market.

Second, China has a flat transaction structure and the development of market makers is inadequate. A hierarchical structure among market makers and clients has not been formed, and one-to-one inquiries are a more popular means to fulfill transactions.

In addition to market access issues, China's derivatives market itself is still underdeveloped, thus partly limiting investors' capability to hedge risk. First, the derivatives market in China started late and has a relatively small market size with less developed instruments compared to mature financial markets. When investing in RMB bonds, foreign institutional investors do not have enough tools to hedge against interest rate risk, exchange rate risk, and credit risk. Thus, some complicated trading strategies may be hard to implement. Second, while Chinese government bond futures can be used to hedge interest rate risk and thus can increase the liquidity of the Chinese government bond market, commercial banks, the largest bond holders, are currently prohibited from participating in the bond futures market.

The Custodian and Clearing System

The CIBM operates under a single-tier custodian system, while a multitier custodian system is the more internationally accepted practice. The single-tier custodian system has some advantages. The possibility of market intermediaries misappropriating clients' assets is minimized, and collection of information and statistics is easier. However, since all transactions must be settled at one central depository, the total cost of large quantities of settlements is rather high. Furthermore, it may be difficult for a central depository to provide customized services for such a huge number of investors. In contrast, under a multitier system, custodians are divided into different tiers and ultimately centralized at one central depository. Not only is this system ultimately centralized, but it also can cater to different investors around the world. Usually international investors can make their own choice of custodian system and custodians, with no mandatory requirements. International investors generally prefer to use the existing custodian system when entering new markets. In a single-tier custodian system, all services are provided exclusively by the central depository; thus, compatibility is poor and it is hard to meet global investors' needs very well.

It is also problematic that China's domestic depository institutions are not fully linked to one another, and some services in particular cannot be performed electronically. China's central depository institutions include ChinaBond, the China Securities Depository and Clearing Corporation, and the Shanghai Clearing House. At present, only China government bonds, local government bonds, and corporate bonds can be transferred between ChinaBond and the China Securities Depository and Clearing Corporation electronically, while electronic transfers for other bonds are not feasible at the depository institution level. As a result, bond lending and other types of transactions involving multiple depository institutions cannot be processed electronically and must be registered manually, thus reducing trading efficiency.

In addition, although the settlement period and settlement method in the RMB bond market do not restrict investment, there is still room for improvement in terms of refined services for some investors in some situations. With regard to settlement periods, investors can freely choose T+0/1/2 (same trading day, or one or two days after the trading day), which meets the basic settlement requirements of foreign investors in various time zones. However, some foreign investors are accustomed to a relatively longer settlement period (for example, the settlement period in Japan is typically three days after the trading day), and they need to adapt to China's bond market. Furthermore, real-time gross settlement is provided by China's central depository. For investors who frequently engage in trading, the capital requirements and costs are higher under the gross settlement method than under the net settlement method.

Convenience and Availability of Information

Foreign investors must open multiple accounts for specific transactions or purposes, and the use of the funds in each account is strictly limited. For example, an account opened by a foreign investor for investing in the interbank bond market may be used only for transactions and settlements relating to investment in the interbank bond market. It is not permissible to use one account for multiple purposes, which is inconvenient for foreign investors.

Foreign investors may enter the interbank bond market through direct investment or Bond Connect, or as QFII or RQFII, but they cannot freely convert bond positions between those accounts opened in different channels. Thus, sometimes foreign investors may have to sell bonds from one account and then buy from another, and incur unnecessary costs.

When they file to invest in the bond market, foreign investors must indicate the "proposed investment amount." Though providing this information has no actual legal effect, it still causes unnecessary worry for foreign investors. The filing form sometimes must be resubmitted if the actual investment is below 50 percent of the proposed amount. This is seen as a legal risk by some investors, who worry that there will be punitive measures as a result.

Accessibility of information should be improved. Currently, different types of RMB bonds are regulated by different agencies and related information is scattered across different websites. Investors are unable to obtain all information in one place. Furthermore, the scope of published policies in languages other than Chinese is still relatively limited and much information is not accessible by foreign investors.

The Support System and the Legal System

Ratings on RMB bonds are sometimes inflated. They do not sufficiently reflect actual risks in RMB bonds and only give limited guidance for bond pricing. China's rating industry needs to rebuild credibility. There is a relatively large mismatch between domestic ratings and international ratings. One possible reason is the low actual bond default rate caused by implicit or explicit guarantees.

Other reasons include mandatory credit ratings and the minimum credit rating requirement for bond issuance as well as the issuer payment model.⁴

Accounting and auditing policies for panda bond issuance could be further clarified and made more internationally compatible. According to current regulations in China, financial statements of panda bond issuers must be reported according to Chinese accounting standards or standards recognized by China's Ministry of Finance and equivalent to Chinese accounting standards (currently only European Union and Hong Kong SAR accounting standards are accepted). If issuers adopt other accounting standards, they must disclose a table reconciling discrepancies. As for auditing, bond issuers must employ accounting firms qualified to deal with securities and futures in China unless the country or region in charge of the auditing firms has signed an agreement with China's Ministry of Finance on auditing oversight (currently only Hong Kong SAR has done so). After the global financial crisis, the Group of Twenty advocated for the establishment of globally unified high-quality accounting standards. China has made some progress in achieving substantive convergence with respect to the International Financial Reporting Standards (IFRS), but there are still important differences. When issuing panda bonds, most institutions still need to disclose a discrepancy reconciliation table, which is equivalent to preparing another set of financial statements according to Chinese accounting standards. That has become one reason why many foreign institutions choose not to issue panda bonds.

No clearly defined tax arrangements have yet been issued. Foreign institutions need a clearly defined tax policy in order to calculate after-tax yields and arrange tax payments, but current tax arrangements are not explicit. Only some scattered documents clearly set out specific tax arrangements for some types of securities. Therefore, foreign investors have no choice but to reserve some funds for possible changes in tax policy, thus resulting in uncertainty and inconvenience for foreign investors.

Foreign institutional investors are unable to freely select derivatives master agreements. The master agreements of the Chinese-based National Association of Financial Market Institutional Investors (NAFMII) and the New York-based International Swaps and Derivatives Association (ISDA) are very similar.⁵ The main differences are reflected in legal applicability, dispute resolution, contract currency, and other terms. Overall, the NAFMII Master Agreement relies on Chinese law. When a dispute arises in a transaction, it is arbitrated in China by default, where Chinese arbitration law and related judicial procedures are applicable. The ISDA Master Agreement, by contrast, relies on the Anglo-American system of common law, and disputes are litigated in court in the United Kingdom or in New York state in the United States, where the judicial procedures of the

⁴ In an issuer payment model, issuers rather than investors pay the rating fees.

⁵ Founded in September 2007, under the approval of the State Council of China, NAFMII aims to promote the development of China's over-the-counter financial market (the interbank bond market, interbank lending market, foreign exchange market, commercial paper market, and gold market). See http://www.nafmii.org.cn/english/aboutus_e/aboutnafmii_e/.

United Kingdom or the state of New York are applicable. As the ISDA Master Agreement is widely used in mature markets, international investors expect to be able to choose between the NAFMII Master Agreement and the ISDA Master Agreement so as to reduce legal costs. At present, a foreign central bank can freely choose from the two types of agreements, but private foreign institutional investors can only sign the NAFMII Master Agreement.

The legality and validity of “close-out netting”⁶ remain uncertain, and it affects the mandatory margin payment and capital provisions. In derivatives trading, whether close-out netting can be implemented effectively is the key to avoiding the risk of insolvency for the traders, and thus is often the focus of both sides of a transaction. The main clauses of both the NAFMII Master Agreement and the ISDA Master Agreement involve the net settlement mechanism. However, since the current bankruptcy law system in China does not take into account the peculiarities of derivatives trading, the legality and validity of close-out netting remain uncertain, which causes legal risks in operation and has an adverse impact on mandatory margin payment and capital provisions for financial institutions, and thus increases transaction costs and capital requirements.

Cross-Border Capital Flows

The amount and proportion of funds that can be remitted are still subject to restrictions, and the predictability of the relevant policies needs to be improved. Current regulations require that the ratio of outwardly remitted foreign exchange and RMB funds be basically consistent with cumulative inward remittances, and that upward or downward variability must not exceed 10 percent, thus limiting the capability of foreign investors to freely remit funds. In addition, international investors still have concerns regarding China's capital management policy and transparency in policymaking, worrying that remitting out of China could be difficult in the future. These concerns have a significant impact on the willingness of foreign investors to participate in China's bond market.

POLICY RECOMMENDATIONS

To improve the quality of opening up and the level of development of the bond market and further raise the status of the RMB as a reserve currency, the following policy recommendations are proposed.

1. Allow More Access to Different Types of Bond Transactions and Increase the Share of Foreign Investors' Participation

Allow foreign institutional investors to engage in repo transactions: Bond repo is not only a means of financing and securities lending, but also a hedging instrument

⁶ When counterparties have a number of obligations to each other, they can agree to offset and net those obligations. This is known as close-out netting.

and short-term investment tool. With a broad range of applications and as an important money market tool, bond repo is arguably the most important type of bond-related transaction. Lack of access to bond repos greatly restricts investment by foreign institutional investors and reduces their willingness to invest. Foreign institutional investors should be permitted to engage in bond repo transactions.

2. Increase Market Liquidity and Enhance Risk Management Tools

Further enhance the variety of investors and steadily increase the degree of opening up of the bond market, both domestically and externally: This would reduce the proportion of investors, such as banks and insurance institutions, whose main objective is to hold bonds to maturity, and thus increase the demand for trading.

Improve the market-making mechanism and increase market liquidity: The inadequate development of market makers has more deep-rooted causes, such as the micro-structure of the bond market and still-unfinished interest rate liberalization, but the market-making mechanism also has significant room for improvement so that price discovery capabilities can be enhanced, and the liquidity of the bond market can be increased.

Further develop the bond futures and derivatives markets and provide investors with a better variety of risk management tools: Chinese government bond futures have a price discovery function and can improve investors' risk-hedging capabilities, returns, and willingness to invest, and also help to boost liquidity in the bond market. The bond futures market should continue to be nurtured and improved. When the opportunity arises, the range of entities that can trade futures and other derivatives should be expanded domestically and externally. In addition, interest rate derivatives and exchange rate derivatives should be further developed to help investors hedge risks and manage portfolios.

3. Establish a Custodian System in Line with International Practices

Gradually establish a multitier custodian system in line with international practices: The multitier custodian system is currently the prevailing custodian system of the international financial market. Because of the significant differences between the single-tier and the multitier custodian systems, conversion costs for foreign investors entering China's bond market are high. There are no obvious risk factors associated with a multitier custodian system, and it can better solve problems in cross-border investment in terms of legal compliance, market rules, and language differences. Operational risks of this switch are fully manageable. A custodian system in line with international standards and international investors' customs should gradually be established so as to greatly expand the range of the potential foreign investor base.

4. Further Simplify the Account Opening Procedure and Make It More Convenient for Foreign Institutions to Invest in the Bond Market

Substantially simplify the account opening process and eliminate unnecessary requirements for documentation: At present, the time needed to open an account is excessively long. China should discard the “proposed investment amount” and other unnecessary requirements, allow investors to submit material in electronic form to save the time of sending it by mail, and gradually put the entire process of opening an account online.

Remove unnecessary policy restrictions: Permit foreign investors to freely transfer positions among QFII, RQFII, Bond Connect, and CIBM bond accounts, thus improving the efficiency of usage of funds.

Allow accounts to be used for multiple purposes: Explicitly allow foreign entities to carry out overnight balance management of funds in the CIBM account, and permit other possible reasonable application of funds in the future.

Improve information availability: China should consolidate the sources of information on the bond market provided by different regulatory agencies, increase the proportion of policies simultaneously issued in Chinese and English, and enhance information transparency, so as to facilitate a one-stop shop of bond-related information and help investors understand China's bond market policies in a timely manner.

5. Create a Friendly and Convenient Institutional Environment

Provide more convenient accounting and auditing systems: All investors in the CIBM are institutional investors, and unlike retail investors, they have the capacity to understand different accounting standards. Major accounting standards such as Generally Accepted Accounting Principles, adopted by the US Securities and Exchange Commission, could be allowed in the CIBM. The reconciliation table of panda bond issuers could be simplified so that it does not create an excessive burden on companies. At the same time, qualification requirements regarding auditing firms could be relaxed to include more qualified foreign auditing firms.

Clearly define and publish a tax-collection policy concerning investment in the bond market with clear rules, strong operability, and detailed collecting procedures as soon as possible: The adverse effects caused by uncertainty in tax policy on corporate investment decision making should be reduced, and a stable and friendly tax environment should be created.

Allow foreign investors to freely choose to sign the NAFMII or ISDA derivatives Master Agreement: Many international investors believe that not being allowed to sign the ISDA Master Agreement is one of the obstacles to entering the interbank bond market and results in higher legal costs. All institutional investors should be permitted to freely choose the master agreement they prefer.

Improve bankruptcy law and eliminate uncertainty in terms of legislation: The legality of close-out netting should be explicitly defined as soon as possible, so as to mitigate the adverse effects of legal uncertainty on margin payment and capital provisions for financial institutions and significantly reduce transaction costs.

Promote the healthy development of the ratings industry and introduce international rating agencies into China's bond market in an orderly manner: The regulators should repeal the minimum credit rating requirement, reduce excessive protection of the domestic rating industry, strengthen supervision during the process, and further regulate the behavior of credit rating agencies so as to improve the quality of ratings. Introducing international rating agencies into China's bond market would provide multiple options to international investors. While there is no policy obstacle for qualified international credit rating agencies to enter the CIBM, detailed rules and regulations need to be published to implement the opening-up policy. In addition, during the process of introducing international rating agencies, it will be necessary to address the likely problems caused by the large discrepancies between domestic and international rating systems.

6. Improve Management of Cross-Border Capital Flows to Enhance Foreign Investors' Confidence in China's Bond Market

Further improve the management of cross-border capital flows and reduce unnecessary restrictions: Convenience of repatriation has always been one of the most important factors overseas investors consider when deciding whether to invest in China's bond market. Imposing limitations on the amount or currency choice of repatriation inconveniences foreign investors and reduces their willingness to invest and their confidence in participating in China's bond market. China should continue to implement a managed floating exchange rate regime based on market supply and demand, make adjustments with reference to a basket of currencies, continue to deepen exchange rate regime reform, and enhance the flexibility of the RMB exchange rate. China also needs to lift unnecessary restrictions on the flow of funds, and increase the continuity and transparency of relevant policies, which can help reduce policy uncertainty and stabilize market expectations, thus enhancing investors' confidence in China's bond market.

CONCLUSIONS

China's bond market has developed rapidly in the broader context of China's reform and opening up process. In particular, addition of the renminbi to the SDR currency basket has further promoted the advancement of the bond market. However, despite significant progress, the bond market still lacks the depth and breadth needed for the renminbi to become a major reserve currency.

A comprehensive set of policy measures is needed to address existing issues. The first is to broaden the bond schemes for foreign entry, improve market liquidity, and develop hedging tools. Second, it is important to establish a

custodian system in line with international practices, and simplify the processes and improve convenience for foreign institutions in investing in the bond market. Third, greater flexibility in terms of accounting and auditing and more clarity on tax treatment are needed. Finally, the government should promote the sound development of the rating industry, refine the management of cross-border financial flows, and enhance foreign investors' confidence in the renminbi bond market.

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Strengthening Financial Stability in China's Bond Market

MIAO Hui

China has made good progress in developing its bond market, including streamlining the regulatory requirements for bond issuance, trading, and investment. Several reform initiatives have underpinned China's rapid growth, and the country now hosts the third-largest bond market and second-largest credit bond market in the world. Yet, more needs to be done to ensure financial stability.

Among the positive initiatives, many sectors are close to registration-based issuance, such as privately placed corporate bonds, negotiable certificates of deposit, commercial paper, and medium-term notes. In addition, approval requirements and procedures for public issuance are transparent. The interbank bond market has largely opened to overseas financial institutions, and foreign investors can also access it through the Bond Connect program¹; overseas investors can access the exchange bond market through the Qualified Foreign Institutional Investor and Renminbi Qualified Foreign Institutional Investor programs.

More diversified issuers, instruments, and investors in the bond market have emerged. Despite the dominance of public sector bonds (such as local government bonds and China Development Bank bonds), the credit bond market has developed substantially and now accounts for 40 percent of total debt stock (CCDC 2018). Policymakers view direct market-based finance as a complement to the bank-dominated financial system (see also Chapter 4 on credit bonds). With a favorable policy environment, market capitalization of credit instruments has increased 28 percent annually from 2012 to 2017, to reach RMB 29.5 trillion by the end of 2017, comparable to public sector debt of RMB 40.2 trillion (CCDC 2018).

Regulatory reforms, meanwhile, have largely contained the financial stability risk in the bond market. To be sure, rapid bond market growth could have posed risks, but policymakers have met these with resolve; potential risks such as liquidity, leverage, and market risks have recently declined. For example,

This chapter is based on China's Financial Sector Stability Program Recommendations. See IMF 2017.

¹ The Bond Connect program, which allows Hong Kong SAR investors to purchase China mainland bonds, was launched on July 3, 2017.

Box 10.1. Bond Market Turmoil in December 2016

After a multiyear bull market, the Chinese bond market weakened at the end of 2016. On December 14 of that year, the security brokerage firm Sealand Securities defaulted after suffering from a big loss on a RMB 20 billion leveraged bond repurchase (repo) investment. Sealand had funded levered positions with bank credit and appeared to have circumvented regulatory limits on repo haircuts.

The default on the repo led to a general loss of market confidence toward brokers, and banks started to reduce short-term lending to nonbank financial institutions for fear of counterparty risk.

As a result, although the China Securities Regulatory Commission coordinated credit rollover for Sealand to prevent its insolvency, interbank rates increased substantially, repo and bond market liquidity shrank quickly, and money market fund redemptions rose.

Markets stabilized only after banks, under guidance from the People's Bank of China, provided credit to the nonbank financial institutions. While risks were contained, the use of banks to provide credit to nonbank financial institutions raised the moral hazard issue and highlighted the need for a more coherent approach toward systemic liquidity risks.

regulators have tightened risk management guidance on liquidity and leverage of collective investment vehicles (discussed in the next section) in response to bond market turmoil in December 2016 (Box 10.1).

Overall, this chapter takes the view that bond market volatility could rise given three risk factors, including market valuation of interest rates and credit risks, liquidity and maturity mismatches among bond investors, and high financial leverage of investors and issuers in the bond market. The chapter highlights crucial reform measures that can further reduce financial stability risks.

BACKGROUND AND RECENT DEVELOPMENTS

The new unified rule on asset management products released in April 2018 is a milestone in reducing risks facing the collective investment vehicles (Box 10.2).² A collective investment vehicle is a special-purpose entity to hold investments and then repackage these investments as financial products for retail and institutional investors. Collective investment vehicles can take many forms and be owned by different entities. Popular collective investment vehicles include banks' wealth management products, mutual funds offered by brokers and asset management firms, and some short-term savings products offered by insurance firms. Collective investment vehicles have become the main vehicles for fixed income investors because they typically offer promised fixed rates of return. Recent regulation in China has harmonized the regulatory standard toward various asset management products

² The People's Bank of China, together with other regulators, published the unified rule on asset management products on April 27, 2018, after a six-month public consultation. The new rules substantially tightened regulations on investment products and activities in the shadow banking sector.

offered by banks, brokers, and mutual fund and insurance firms, which are the major holders of credit bonds as income generating assets. The liquidity and maturity mismatch embedded in these collective investment vehicle products could be significantly reduced by improved valuation standards, redemption rules, and asset allocation restrictions. To meet the promises of daily redemption, the collective investment vehicle might have to hold more liquid and safe assets and may adjust its redemption rules, such as a swing price or redemption gate.

The illiquid nonstandard credit assets (mostly bank loans) that have been held by collective investment vehicles will be gradually phased out within the grace period by the end of 2020. These tightened regulations will improve bond market stability by reducing investors' incentives to run against the bond market during heightened market volatility.

The simplified liquidity coverage ratio rule for small and medium-sized banks could cap the rapid growth of their bond investment portfolios funded by short-term interbank borrowing, and thus reduce maturity mismatches. In addition to asset management firms, small and medium-sized banks are major investors in the bond market, some of them borrowing in the short-term wholesale market by issuing negotiable certificates of deposits or wealth management products and investing the proceeds in the bond market. Negotiable certificates of deposit typically have tenors of three to six months while corporate bonds tend to mature in two to four years. Concerned about excessive risk taking, the China Banking and Insurance Regulatory Commission has issued simplified liquidity coverage ratio rules for small and medium-sized banks to limit their liquidity mismatches. Previously, small banks were exempted from Basel III liquidity coverage ratio requirements.

Tighter leverage limits on collective investment vehicles and higher eligibility requirements for repurchases (repos) have reduced the financial leverage of bond investors. Previously, investors in the bond market had leveraged themselves through repos or structured finance vehicles. For example, subordinated structures with senior and junior tranches provided leveraged exposure for investors. In response, the China Securities Regulatory Commission imposed a regulatory cap on leverage at 1.4 times for investment funds. The minimum asset requirement for investors to be eligible for repo purchases was raised significantly, and the "haircuts" rule and rating requirements for repos at the stock exchanges were also tightened. In addition, certain low-rated corporate bonds were excluded from eligibility for repos at the exchanges.

Given that bond defaults have increased over time and the market-based approach to dealing with defaults has become more acceptable among investors, this might reduce the prevalence of perceived implicit guarantees. Markets will be able to price credit spreads based on corporate fundamentals and more differentiation of credit pricing will likely emerge (see Chapter 13 on implicit guarantees). And by separating wealth management product business as an independent entity from the banks, and adopting variable net asset valuation instead of constant net asset valuation, moral hazard risks caused by perceived implicit guarantees on wealth management products can be reduced. This should encourage investors to

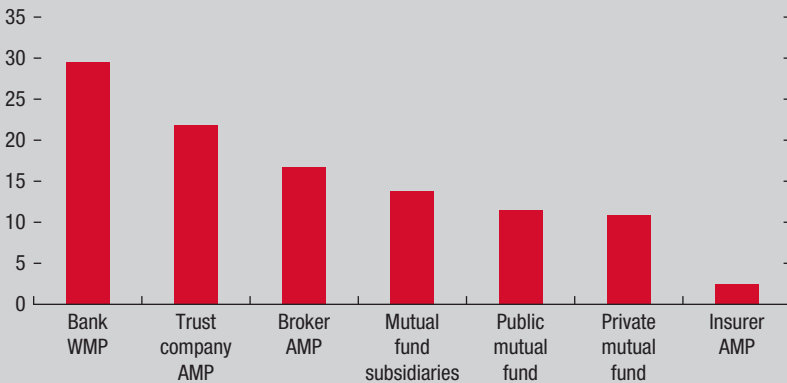
Box 10.2. New 2018 Unified Rule on Asset Management Products

After a decade of financial liberalization, many entities have been setting up collective investment vehicles to run asset management business. Their total size exceeded RMB 107 trillion by the end of 2017 (Figure 10.2.1). These collective investment vehicles hold most of China's credit bonds in their investment portfolios. However, these entities are regulated by different regulators with different rules even though they engage in very similar businesses, which in the past led to regulatory arbitrage and excessive risk taking. The new unified rule on asset management products released on April 27, 2018, aims to set a homogeneous standard for all these collective investment vehicles and reduce systemic risks.

Key measures include (1) prohibiting implicit guarantees of investment return; (2) imposing more restrictive asset allocation requirements to reduce liquidity and maturity mismatches; (3) raising the eligibility requirements for qualified investors; (4) implementing higher disclosure standards; (5) introducing tighter regulatory limits on leverage for each investment product; (6) separating investment units legally from banking business and requiring more variable net asset valuation instead of constant net asset valuation to reduce the risks of moral hazard; given that the investment product is marked to market under variable net asset valuation, the risk of underlying assets can be passed through to investors; (7) imposing strict license requirements for applying for asset management business; and (8) gradually phasing out investment in nonstandard credit assets before the end of 2020.

The successful implementation of these new rules would reduce stability risks in the bond market (CITIC 2018).

Figure 10.2.1. Assets under Management, by Entity Type, 2017
(Trillions of renminbi)



Sources: Asset Management Association of China; and China Central Depository and Clearing Co., Ltd.
Note: AMP = asset management product; WMP = wealth management product.

pay more attention to interest rates and credit fundamentals when investing in the bond market.

However, the bond market could still face a challenging economic and regulatory environment. In general, this chapter looks at the financial stability of the bond market from three risk angles:

- *Market valuation of interest rates and credit risks:* Bond market valuations in terms of interest rate and credit risk premiums could face high uncertainty from global and local factors. Spillover effects on Chinese market rates from the normalization of US Federal Reserve monetary policy will be gradually felt as the Chinese bond market is internationalized (see Chapter 2 on China's bond market and global financial markets). Locally, ongoing deleveraging will likely contribute to tighter domestic liquidity conditions. Going forward, more actual bond defaults will also lead to repricing of credit risk, and possibly widen credit spreads.
- *Liquidity and maturity mismatches:* Liquidity risks and maturity mismatches remain high in the shadow banking sector. Regulatory reform on shadow banking is welcome progress and will significantly reduce medium-term risks, but the phasing in of various regulatory reforms could create transitional risks in the short term, and investment demand for bonds will likely shift away from shadow banking.
- *Financial leverage of investors and issuers:* Many corporate issuers have high leverage and low interest rate coverage ratios, and credit defaults could increase as interest rates rise and refinancing becomes more challenging.

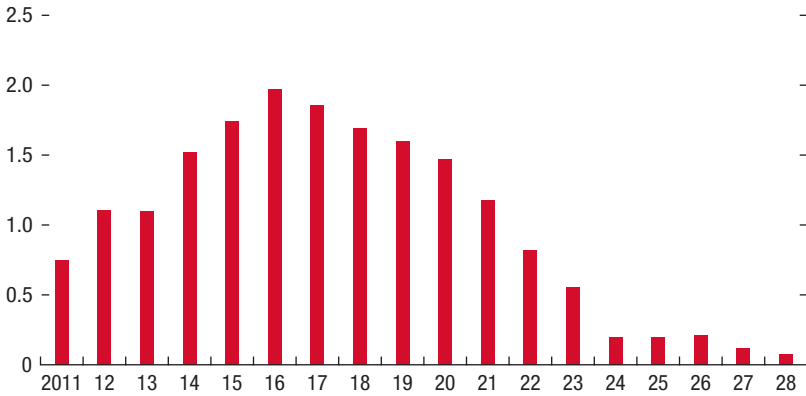
The assessment now turns to these specific financial stability risks that need close monitoring in the bond market: rollover, credit (default), liquidity, and leverage risks.

ROLLOVER RISK

Corporate bond rollover risks will increase amid waning demand from wealth management products and higher market rates. The size of the nonfinancial credit bond market reached RMB 18 trillion in 2018, of which RMB 8.6 trillion was issued in 2016 (CCDC 2017). Most corporate bonds are held by collective investment vehicles. As regulators have tightened rules on wealth management products and mutual funds, as stated in the new unified rules for collective investment vehicles, the investor base for these corporate bonds has shrunk. Given that these credit bonds typically mature in two to five years, the rollover requirement will be very high from 2018 to 2020. Credit bond redemptions per quarter during this period will stay at elevated levels, close to RMB 400 billion (Figure 10.1), as credit bonds issued in 2016 mature.

However, the primary market for corporate bond issuance has been very volatile. Corporate bond issuance in May 2018 slowed sharply following a few high-profile defaults. Credit spreads on lower-rated bonds widened to their highest levels since 2016, affecting corporate bond market financing. Credit bond net financing

Figure 10.1. Maturity Profile of Maturing Nonfinancial Corporation Bonds, 2011–28
(Trillions of renminbi)



Sources: Bloomberg L.P.; and WIND Economic Database (www.wind.com.cn), May 30, 2018.

dropped to RMB 75 billion in May 2018, compared to RMB 300 billion–RMB 500 billion in the previous two months (Figure 10.2). Going forward, banks may not be able to refinance some local government financing vehicles and property developer bonds that were previously held by the collective investment vehicles because of the People's Bank of China's Macro Prudential Assessment Framework. The loss of financing channels because of ongoing restructuring of the shadow banking sector could contribute to more credit events. Thus, low-rated borrowers could see more credit defaults as a result of rising refinancing needs and a shrinking investor base, weakening credit quality, and higher refinancing costs.

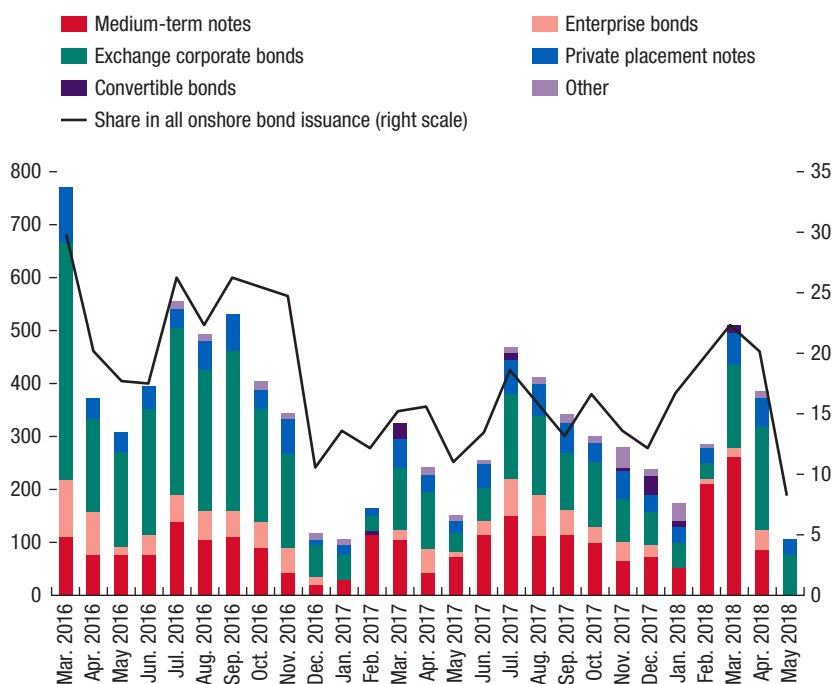
DEFAULT RISK

Credit defaults by private enterprises and local state-owned enterprises increased in 2018, although the overall level of default remains low. In the first five months of the year, more listed firms and a few large private enterprises defaulted on bond payments (Figure 10.3).³ Monthly bond defaults increased 17 percent year over year in 2018 to RMB 3.7 billion. The average size of each bond defaulted increased to RMB 0.9 billion in 2018 from RMB 0.2 billion in 2014, as more large local state-owned enterprises and private firms went bankrupt. Local state-owned enterprises in the coal production sector also faced low coal prices and government pressure to reduce capacity. Rising defaults reflect both weak corporate cash flows and challenging refinancing conditions. Because of their

³ In May 2018, Zhejiang DunAn and China Huaxing, both among the 500 largest private firms in China, defaulted on their bond payments, triggering general risk aversion toward private firms by bond investors.

Figure 10.2. Monthly Issuance of China Onshore Corporate Credit Bonds, 2016–18

(Billions of renminbi, left scale; percent, right scale)



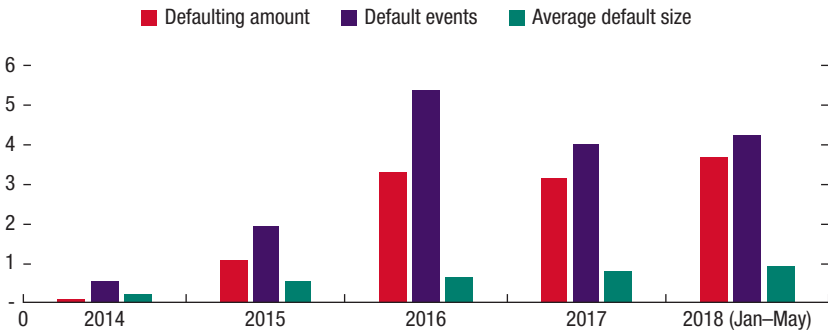
Source: WIND Economic Database (www.wind.com.cn).

limited capacity to analyze credit quality, some investors choose to stay away from the credit bond market following rising defaults. In the first half of 2018, private firms and local state-owned enterprises had more difficulty accessing the bond market at reasonable prices (Fitch 2018). In the worst case, the credit bond market for weak borrowers could shut completely.

However, the annualized default rate is only around 0.3 percent for nonfinancial credit bonds, which is significantly lower than the global norm. Standard & Poor's reported a global corporate default rate of 2.06 percent in 2016 (S&P 2017). It is expected that default rates will edge up as deleveraging continues and market discipline is restored to weed out weak borrowers. The overall credit quality of Chinese listed firms has deteriorated over the last few years under high leverage and rising interest rates, but improved in 2017–18 (Figure 10.4).

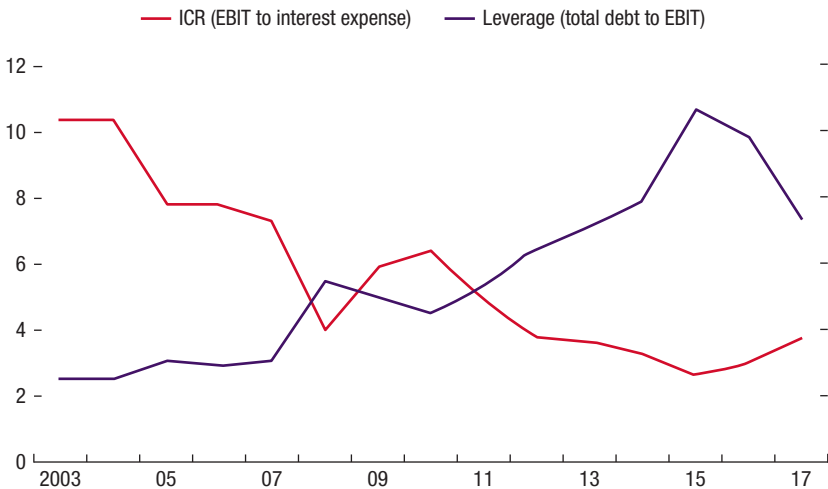
The gradual removal of implicit guarantees will likely lead to repricing of credit risk in the bond market. Corporate default has been rare in the past, partly because of frequent support by various government agencies. For example, local governments tend to support firms in their region to protect employment and

Figure 10.3. Increase in Default Frequency and Size, 2014 through May 2018
(Billions of renminbi; number of events)



Sources: Bloomberg L.P.; WIND Economic Database (www.wind.com.cn); and author estimates.

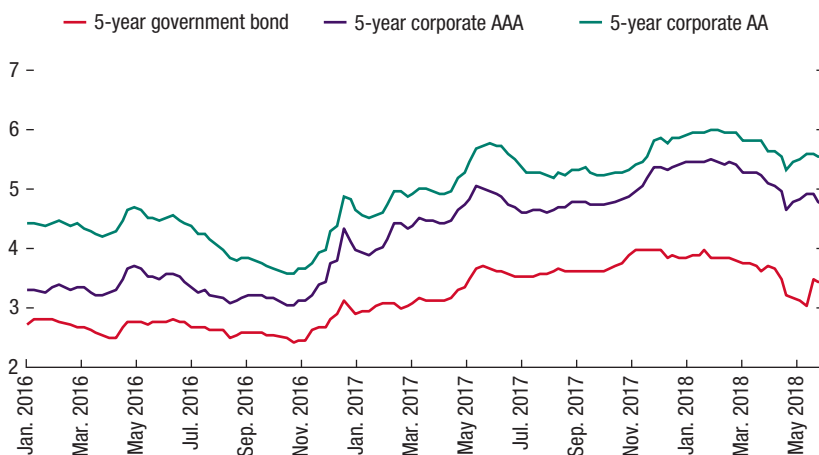
Figure 10.4. Deterioration in Credit Quality of Listed Nonfinancial Corporations, 2003–17



Sources: Bloomberg L.P.; WIND Economic Database (www.wind.com.cn); and author estimates.
 Note: EBIT = earnings before interest and taxes; ICR = interest coverage ratio.

local tax revenue. As the regulators start to prevent bailouts to reduce moral hazard problems, credit risk premiums will increasingly reflect the credit fundamentals of the issuers. Weighted average credit spreads for nonfinancial corporate issuers widened to 1.7 percent in 2018 from 1.4 percent in 2017 and 0.95 percent in 2016 (Figure 10.5). At present, credit rating agencies assume there will be high government support for many issuers and their ratings therefore tend to be concentrated on AAA bonds (Figure 10.6). But as rating agencies emphasize the

Figure 10.5. Widening of Credit Spreads, 2016–18
(Percent)



Source: Bloomberg L.P.

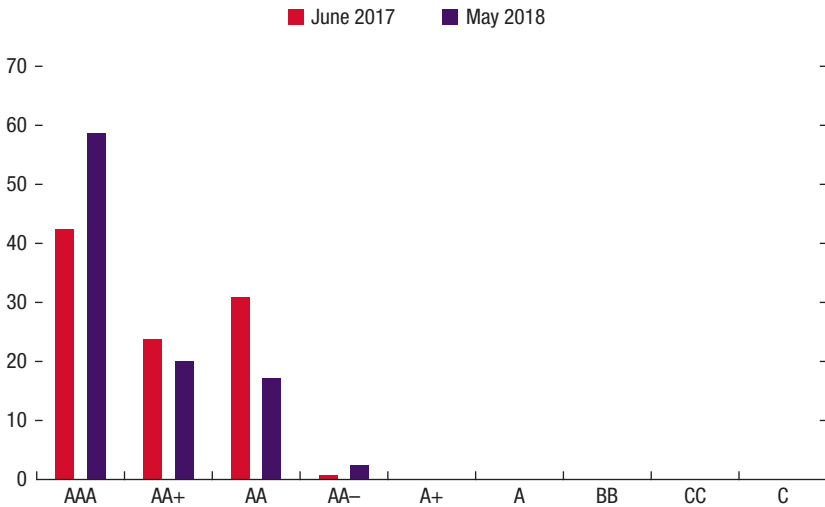
stand-alone credit qualities of the issuers, credit ratings are likely to become differentiated (PBC 2017). As a result, credit premiums will likely widen for many issuers. The weighted average credit risk premium for nonfinancial credit issuers in the onshore bond market was 1.5 percent in May 30, 2018, significantly below the long-term average of 2.8 percent in the US market from 1999 to 2017 (Citibank 2017).

LIQUIDITY RISK

Various indicators show that bond market liquidity is low across sectors, but it is more pronounced for credit bonds. Trading volume has not kept up with surging issuance and the rising bond inventory (Figure 10.7). Bonds issued by policy banks (such as the China Development Bank) are among the most traded debt, while corporate bonds and enterprise bonds barely trade once per year (Figure 10.8; see Chapter 4 on credit bonds). The average trading ticket size is relatively small, and the bid-ask spread is quite high. It is within 20 basis points for actively traded medium-term notes and about 30 basis points for enterprise bonds, while the spread is relatively narrow for actively traded commercial paper (within 5 basis points). In 2016, the average ticket size of cash bond trading was RMB 58 million for enterprise bonds in the interbank market, whereas the average trade size for corporate bonds was RMB 10 million on the exchanges.

The lack of liquidity in the credit bond market is largely caused by the homogeneous investor base, which widely adopts hold-to-maturity investment strategies, as well as perceived low credit risk. The collective investment vehicles, as the

Figure 10.6. Rating Distribution of Nonfinancial Corporate Issuers, June 2017 and May 2018
(Percent)

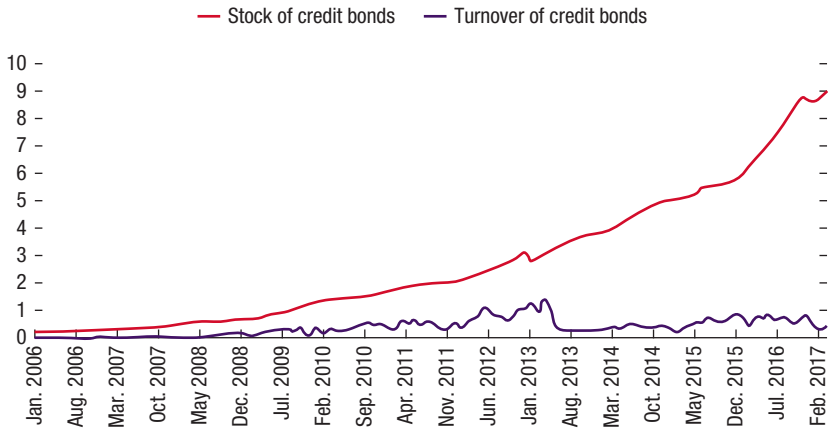


Source: Bloomberg L.P.

major holders of credit bonds, typically finance bond investments through repos to achieve leveraged returns on credit and duration risks. The average daily repo volume on the exchange is about RMB 1.6 trillion compared to total corporate bond size of RMB 4 trillion in 2017 (Figure 10.9), and the average collateral borrowing rate for corporate bonds is around 45 percent. The repo volume has outpaced the growth of the bond market size since 2015 (Figure 10.10). It is plausible that many corporate bonds on the exchanges are placed in the repo collateral pool instead of on active trading accounts. Commercial banks, as the second-largest investors in credit bonds, typically book their bond holdings in hold-to-maturity accounts. When liquidity is needed, banks or collective investment vehicles can easily repo out their bonds to get cash at relatively low interest rates. Therefore, the investment strategies dominated by collateralized repos have reduced the need to trade credit bonds. More important, most bond investors tend to believe that credit risks are negligible, and they therefore lack incentive to actively manage these credit risks through trading.

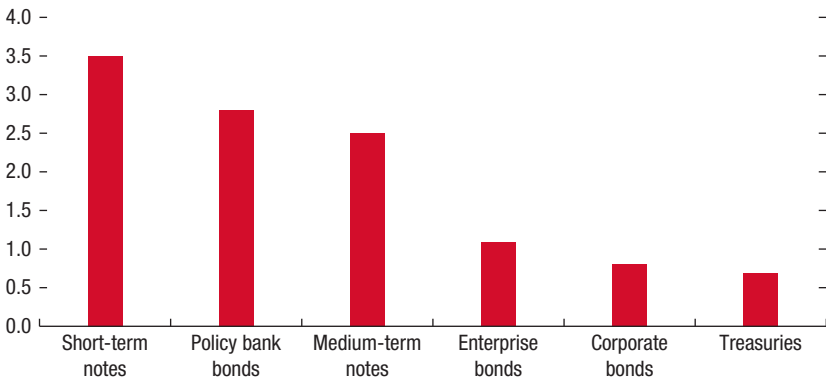
Liquidity risks could be magnified by redemption pressure from collective investment vehicle products after the implementation of the new regulatory regime. The collective investment vehicles have been the major holders of credit instruments in the past (Table 10.1). In the past few years, shadow banking products took a similar carry trade strategy by betting on credit and duration risks with short-term funding, and constant net asset valuation has sheltered them from mark-to-market risk, while implicit guarantees have reduced credit risks.

Figure 10.7. Trading Volume of Credit Bonds, 2016–17
(Trillions of renminbi)



Sources: China Foreign Exchange Trade System; China Securities Depository and Clearing Corporation Limited; and China Central Depository and Clearing Co., Ltd.

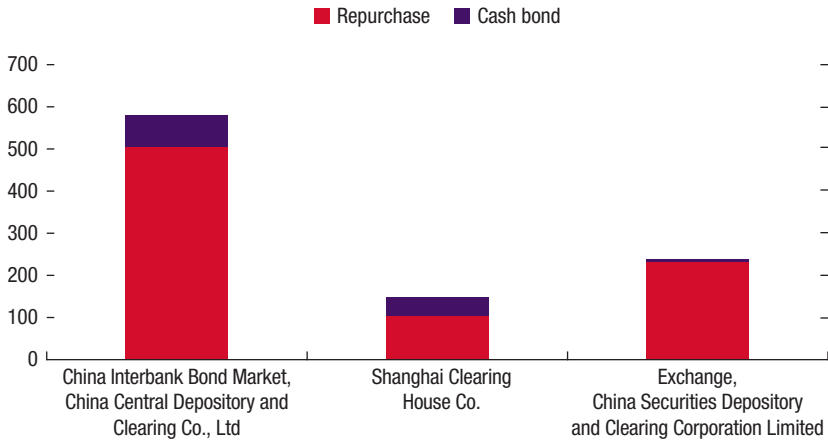
Figure 10.8. Turnover Ratio of Debt Instruments, 2016
(Percent)



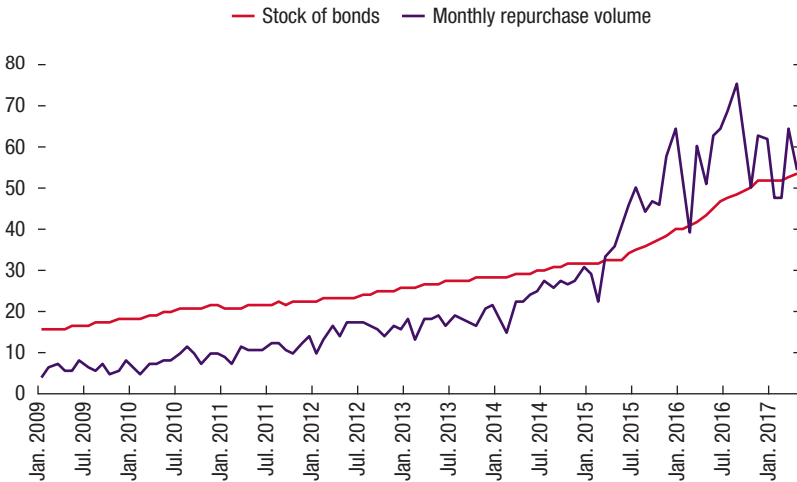
Sources: China Foreign Exchange Trade System; China Securities Depository and Clearing Corporation Limited; and China Central Depository and Clearing Co., Ltd.

The embedded liquidity mismatch could trigger market volatility if redemptions were to increase (Figure 10.11)

The new unified rule on collective investment products, however, could trigger a regime change for bond investment. For example, the change from constant net asset valuation to variable net asset valuation might crystallize investment losses in some wealth management products and lead to front running by

Figure 10.9. Bond Market Turnover, 2016*(Trillions of renminbi)*

Sources: China Central Depository and Clearing Co., Ltd.; Shanghai Clearing House Co.; and China Securities Depository and Clearing Corporation Limited.

Figure 10.10. Repurchase Volume and Bond Market Size, 2016–17*(Trillions of renminbi)*

Sources: China Central Depository and Clearing Co., Ltd.; China Securities Depository and Clearing Corporation Limited; and Shanghai Clearing House Co.

TABLE 10.1.

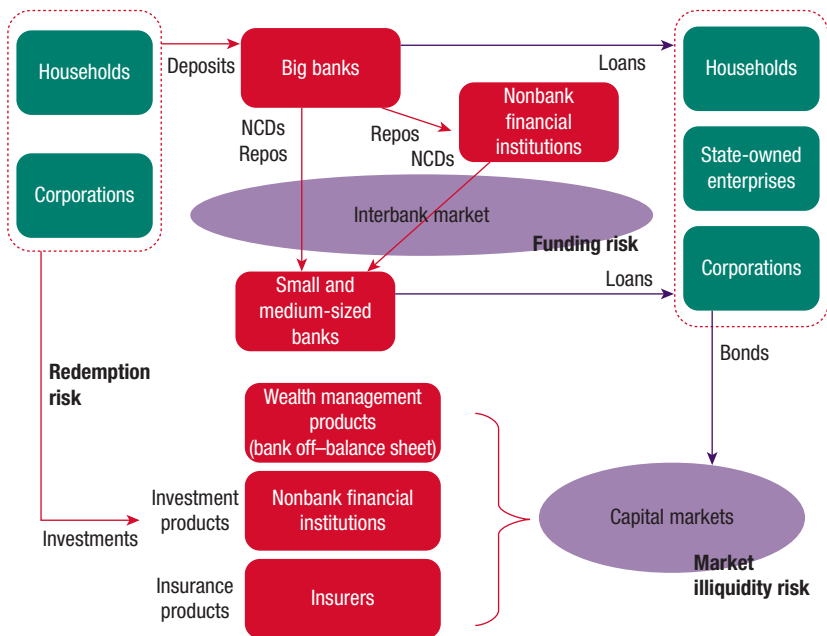
Investor Base of Credit Instruments, by Type, 2016

(Percent)

	Corporate Bonds	Enterprise Bonds	Medium-Term Notes	Negotiable Certificates of Deposit	Commercial Bank Bonds
Banks	18	29	31	55	19
Security companies	12	3	2	1	17
Collective investment schemes	64	62	62	33	59
Insurance companies	7	5	5	0	5
Clearing houses	0	1	0	0	0
Other nonbank financial institutions	0	1	0	11	0

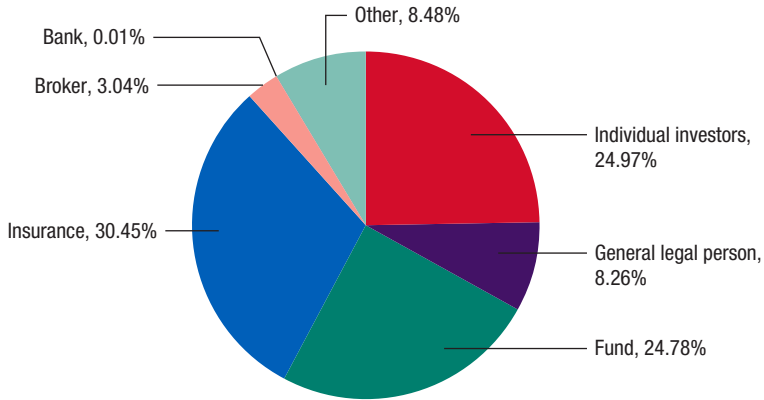
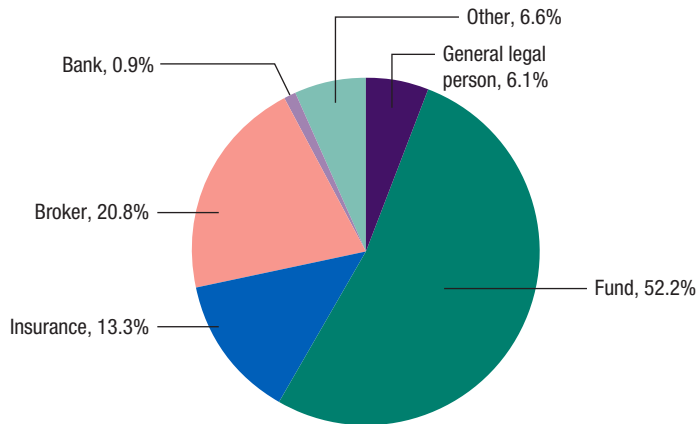
Sources: Shanghai Stock Exchange; China Central Depository and Clearing Co., Ltd; and Shanghai Clearing House Co.

Figure 10.11. Simplified Illustration of Liquidity Interlinkages, Highlighting Risks



Source: Author.

Note: NCD = negotiable certificate of deposit; repo = repurchase.

Figure 10.12. Lenders and Borrowers in Exchange Repurchases, by Type, 2016**1. Lenders****2. Borrowers**

Sources: China Securities Regulatory Commission; and Shanghai Stock Exchange.

Note: General legal person = mostly corporate.

investors before the end of the grace period to fully comply with the new rule. Selling into an illiquid market could cause major market movement and lead to a vicious cycle. Therefore, the perceived shift of the risk-return profile could trigger an uncertain redemption profile and contribute to asset market volatility.

High-level retail participation in corporate bond repos, meanwhile, might trigger a sudden stop of funding for corporate bond investment in case of rising credit defaults. Individual investors accounted for one-quarter of cash lenders in the corporate bond repo market on the exchange, but individual investors are not

allowed to borrow (Figure 10.12). Most of these repos are overnight, and investors are attracted by the higher interest rates and liquidity. With the China Securities Depository and Clearing Corporation as the central counterparty, investors tend to perceive the credit risks from repos as minimal. The haircuts on corporate bonds are largely based on credit ratings. Given the large scale of retail lending on the repo market, it might be difficult to allocate loss directly to retail investors in case of surging credit defaults. Moreover, the corporate bond market lacks liquidity and it might be difficult to liquidate corporate bonds in case of default by the counterparty. Most repos are structured as collateralized repo. Some legal scholars express concern about the certainty of legal rights over the collateral in bankruptcy courts (IMF 2017). Therefore, the large volume of corporate bonds financed by retail investors in the repo market could pose stability risks.

LEVERAGE RISK

Leverage risks could be masked by the multiple layers of credit intermediation and structured products, although leverage at the level of individual products and entities is well regulated within the prudential limit. Leverage at the individual-product level has moderated and been capped by regulations. But some structured derivative products such as collateralized bond obligations and asset-backed securities could mask the true level of leverage. Moreover, cumulative leverage could be much higher as some credit products are intermediated in a lengthy chain through multiple layers of products and cofinancing. The lengthy chain of credit intermediation in the shadow banking sector could mask the true level of leverage. Consider the example of a small bank that issues six-month negotiable certificates of deposit to invest in a corporate bond fund for yield enhancement. The managers of the bond fund use repos to increase leverage (such as up to a regulatory cap of 1.4 times) and have bought into other structured products, which also have increased leverage through subordination and repo. For the small bank as the end investor, the true leverage is accumulated over the lengthy intermediation process. The new unified rule on investment products will limit the funding of fund products to a maximum of two layers.

RECOMMENDATIONS

With these financial stability risks in mind, the 2017 IMF Financial Stability Assessment (IMF 2017) provided policy recommendations to improve bond market resilience focusing on improving pricing efficiency and market liquidity and reducing financial leverage of bond investors. Key recommendations are summarized below:

1. Improve Price Efficiency and Market Liquidity

The breadth and depth of the market need to grow with the size of the market. In particular, the quality of the bond market needs to be enhanced with improved

pricing efficiency and market liquidity. The current segmented interbank and exchange bond markets need to be unified to boost liquidity and price discovery. Credit rating quality needs to be improved to facilitate transparency. The trading and issuance mechanisms for government and corporate bonds need to be improved. More tools and instruments need to be developed to support market making, including a securities lending facility by the Ministry of Finance to primary dealers and more derivative products such as bond futures and interest rate swaps. Security regulators need to encourage market making and periodically call market for corporate bonds. By allowing bigger roles for professional investors, including pension, insurance, and foreign investors, the investor base can be further diversified. And more instruments related to bond market instruments can be listed and traded, such as two-year government bond futures (see Chapter 6 on bond market microstructure and the development of derivatives markets). Improvement of the monetary policy framework such as a policy rate benchmark and greater transparency will also increase the liquidity of short-term government bonds.

2. Promote an Orderly and Market-Based Approach to Deal with Credit Defaults

A more market-based approach is needed to deal with credit defaults, given that more credit events are expected in the future. Streamlined bankruptcy processes will help debt workout and debt recovery for bond investors. Specialized distress funds need to be developed to help trade the impaired credit assets and improve market liquidity and price discovery of nonperforming assets. In addition, to cope with more credit defaults, better data collection and analysis of rollover and credit risks are required to assess the proper policy response for a smooth transition as implicit guarantees are removed over time. Investors need to be guided toward focusing on the credit fundamentals of individual firms instead of bailout potential by the public sector. The People's Bank of China's recent acceptance of more corporate bonds as collateral for its Medium-Term Lending Facilities could avert a general aversion toward corporate credit and restore investor confidence in the credit market.⁴ But in the long term, the mature market must be relied upon to find a clearing equilibrium price for corporate bonds.

3. Further Tighten Rules for Corporate Bond Repurchases on the Exchange

In addition, liquidity and leverage risks in shadow banking products and repos of corporate bonds should be further reduced. There is a need to move from finance- and leverage-driven collateralized repos to security-driven repos (such as outright

⁴ On June 1, 2018, the central bank announced it was expanding eligible medium-term lending facilities collateral to include lower-rated credits, such as bonds rated AA or above for small companies and microenterprises, and AA-rated corporate credit bonds, including enterprise bonds, medium-term notes, and commercial paper.

repos) by further raising the eligibility requirements of collateral and participants in the exchange bond market. The China Securities Depository and Clearing Corporation needs to consider internal ratings and market liquidity rather than external ratings to determine proper haircuts for corporate bond repos. In addition, legal certainty regarding repo collateral rights and netting needs to be enhanced.

4. Provide a Roadmap on Key Systematic Risks to Reduce Market Uncertainty

Authorities need a holistic approach to properly sequence the reforms and communicate to the market in a clear and credible manner to reduce bond market uncertainty. The overall impact on the bond market from the phasing in of financial reforms needs to be evaluated and managed consistently. Critical bond market reforms could include regulatory tightening, interest rate liberalization, local government funding reform, prudential policies for the property market, gradual removal of implicit guarantees, and improving the bankruptcy process.

The authorities have already incorporated some of the key recommendations into the new unified rules on investment products. These are important measures for developing a sound bond market. Implementation will be critical, and reforms need to be properly sequenced and communicated to reduce market uncertainty and ensure orderly functioning of the bond market.

CONCLUSIONS

The bond market has expanded rapidly in the past decade and China's regulations have quickly adapted to contain evolving financial stability risks. Here in particular, the new unified rule on collective investment vehicles is very welcome. As a result, overall financial stability risks are manageable.

Given the dynamism of China's financial system, it will be important to remain vigilant. In particular, market volatility could increase because of a number of factors related to rollover risk, repricing of credit premiums upon removal of implicit guarantees, prevalent liquidity and maturity mismatches among bond investors, excessive leverage obtained through corporate bond repos, lengthy chains of credit intermediation, and potential deterioration of credit quality. The authorities are very aware of the risks, are monitoring developments, and intend to respond if needed. In addition, implementing the new unified rules on collective investment vehicles should be carefully managed to avoid volatile investor redemption and a sudden stop to wholesale funding.

To strengthen financial stability further, it will be important that the breadth and depth of the market become commensurate with the size of the market. Pricing efficiency and market liquidity, in particular, need to be improved with better market discipline and transparency. Further harmonization of rules and regulations, instruments, issuers, and investors across different segments of the bond market will be important. At the same time, improving market-making and

issuance mechanisms and strengthening corporate bond repo rules will improve liquidity. These reforms should go hand in hand with other reforms such as bankruptcy procedures, local government finances, and reform of state-owned enterprises. To minimize market uncertainty, these reforms should be carefully sequenced and clearly communicated.

Overall, the future of China's bond market is bright and holds enormous potential to improve the efficiency of capital allocation and support monetary policy transmission and financial stability.

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Clearing Roadblocks to Foreign Participation

LIU Becky

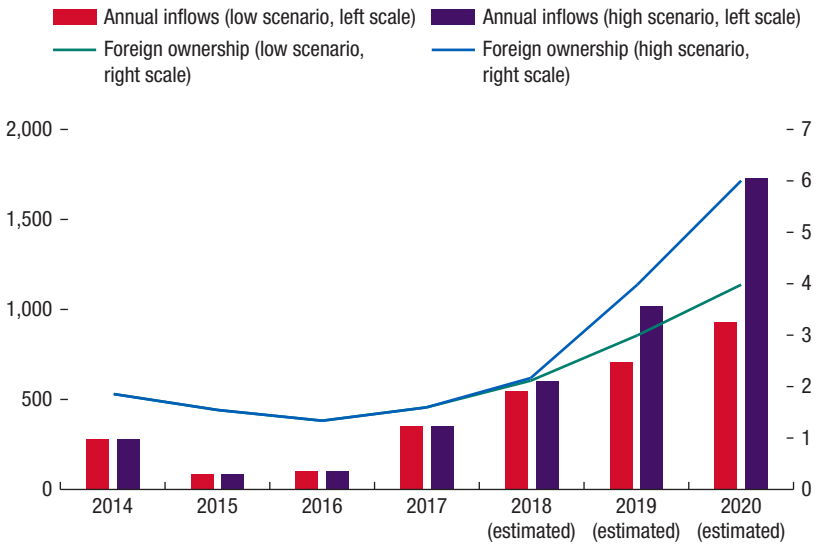
Foreign appetite for renminbi (RMB) assets, including bonds, has regained momentum since the second half of 2017, encouraged by solid economic growth, a better outlook for foreign exchange, and broader access to onshore markets. And the room for further upside is significant. In terms of market development and theoretical accessibility for foreign investors, China's onshore bond and derivatives markets are at least on par with—or have exceeded—many Asian local currency bond markets that are already included in global bond indices. However, the obstacles are likewise impressive. Accessibility remains weaker than in many peer markets, hindered by technical issues including tax uncertainty, documentation hurdles, the complexity and lack of fungibility across various access programs, and operational issues in onshore foreign exchange transactions.

Total foreign holdings of onshore assets—equities, bonds, loans, and deposits—reached a new high of RMB 4.991 trillion as of the end of September 2018, rising by 64 percent from year-end 2016 levels. Foreigners' onshore bond holdings reached a new record high of RMB 1.745 trillion, more than double the year-end 2016 level. And global reserve managers have started to diversify their allocations to renminbi—they held a total of US\$193 billion of RMB-denominated reserve assets as of June 2018, up 114 percent from the end of 2016 and accounting for 1.84 percent of the total.

Foreign ownership of China's onshore bond market, however, remains very low, at just 2.1 percent as of September 2018. Foreign ownership of onshore government bonds, at 7.4 percent, is also materially lower than for other special drawing rights currencies (that is, the US dollar, Japanese yen, euro, and British pound), which range from 10 percent to 60 percent. Foreign ownership is expected to rise to 4–6 percent by 2020 (Figure 11.1), and global reserves in renminbi exceed that of the Australian dollar and will likely soon exceed the Canadian dollar.

Inclusion in global bond indices will boost foreign inflows further. The Bloomberg Barclays index announced in March 2018 that it would include China onshore bonds in its flagship Global Aggregate Bond Index (Global Agg) from April 2019, on the condition that delivery versus payment settlement and

Figure 11.1. Expected Foreign Ownership of China Bonds by 2020
(Annual net purchase, billions of renminbi; foreign ownership of onshore bonds, percent)



Sources: People's Bank of China; Standard Chartered Research; and WIND Economic Database (www.wind.com.cn).

block trade issues are resolved and tax treatment is clarified. The probability of similar announcements by the other two major indices—the Global Bond Index–Emerging Markets index and the World Global Bond Index—in 2019 is about 80 percent. Potential foreign passive inflows upon full inclusion in all three indices could exceed US\$280 billion.

This chapter identifies the important obstacles foreign investors face in the Chinese bond market and suggests possible solutions. It also discusses areas where foreign investors would like to see further improvements that would allow them to increase their asset allocations to China onshore bonds, including the ability and effectiveness of hedging foreign exchange and rates, better cash bond liquidity, less fragmented bond markets, improved credit risk pricing, and creditor protections.

ROADBLOCKS

Foreign inflows to China's onshore bond market have been strong in recent months, but several roadblocks continue to prevent foreign participation from reaching its full potential. Most of these are technical rather than regulatory hurdles. These are the same factors that have been identified as preconditions for China onshore bonds' inclusion in major global bond indices.

The analysis shows that from a regulatory perspective, foreign accessibility to China's onshore bond, foreign exchange, and derivatives markets is reasonably good. It is superior to several Asian and emerging market local-currency markets already included in major bond indices, such as Malaysia, Indonesia, and Korea (see Table 11.1). After resolution of delivery versus payment settlement and block trades, five other practical issues remain:

1. Unclear tax regulations
2. Hedging capacity and documentation issues
3. Insufficient Treasury bond liquidity
4. Lack of harmonization across all access schemes
5. Ineligibility of nonfinancial corporations under current access programs

Tax Uncertainty: The Biggest Hurdle, by Far

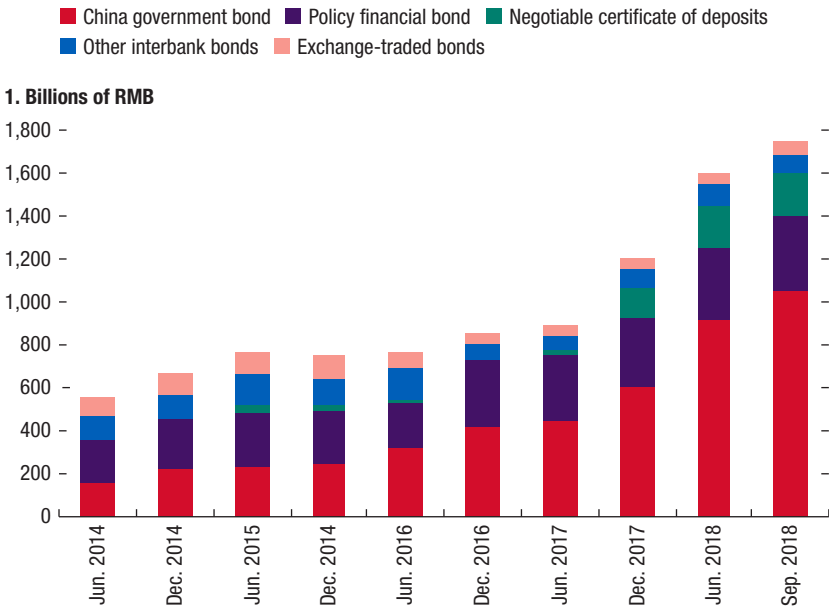
Foreign holdings of China onshore bonds are heavily skewed toward China government bonds (Figure 11.2). Central government bonds made up 61 percent of the total as of the end of September 2018. This strong preference for government bonds, and central government bonds in particular, can be attributed to a high portion of holdings by public sector investors (80 percent of total foreign holdings of China onshore bonds), index inclusion considerations (two out of three major indices will include government bonds only upon China's inclusion), and tax uncertainty about nongovernment bonds.

Although the Chinese authorities announced a three-year exemption on foreign institutional investors' withholding tax and value-added tax (VAT) on interest derived from China onshore bond investments on November 7, 2018, insufficient details have been released. Investors are concerned about any potential tax clawback of previous investments before the exemption becomes effective, and also need to have clarity about future tax treatment after the exemption period expires for long-term investments.

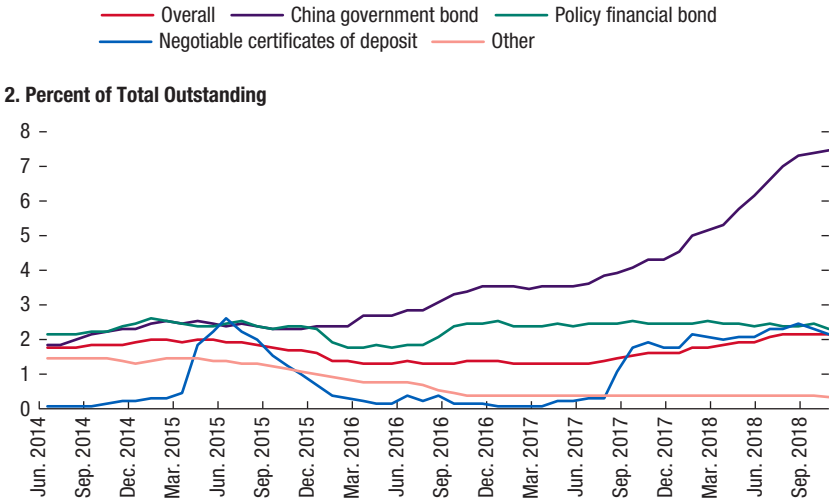
Tax issues have real economic implications for investors' returns and cash flow. Uncertainty about tax rates, tax calculation methodology, and tax collection methodology has materially curbed foreign investors' interest and ability to invest in onshore nongovernment bonds:

- Because of uncertain tax liabilities, many investors are restricted from investing in these bonds by their internal risk management teams or compliance departments.
- For the same reason, most banks are unable to offer products related to nongovernment bonds—such as offering total return swap products backed by onshore negotiable certificates of deposit.
- Mutual funds with retail investors as end clients are unable to invest in nongovernment bonds, as it is practically impossible to perform tax redistribution (clawbacks) to retail investors if they do (do not) withhold tax payments.

Figure 11.2. Foreign Ownership of Onshore Bonds, by Bond Type, 2014–18



Sources: People's Bank of China; China Central Depository and Clearing Corporation; Shanghai Clearing House; and Standard Chartered Research.



Sources: China Central Depository and Clearing Corporation; People's Bank of China; Shanghai Clearing House; Standard Chartered Research; and WIND Economic Database (www.wind.com.cn).

There are three major sources of uncertainty:

- *Tax rates:* The authorities have made no consolidated announcements on the applicable tax rates for foreign investors so far, although it is understood that most tax rates have been released in various documents. The numerous tax regulations—including some very dated ones announced before the launch of the China Interbank Bond Market (CIBM) and Bond Connect programs—and the difficulty of interpreting these regulations, have left big questions about foreign investors' potential tax rates.

The situation is similar for panda bonds (Chinese renminbi-denominated bonds from a non-Chinese issuer, sold in China). While international investors broadly expect no tax on their interest income from panda bonds (given that both issuers and investors are foreign in the China context), official announcements to date have made no mention of the tax treatment of panda bonds.

Table 11.2 outlines the understanding in this chapter of foreign investors' tax treatment, should there be no tax exemption or when the three-year exemption expires. Although a withholding tax of 10 percent—or lower, subject to double tax treaty—on interest income on nongovernment bonds is the current consensus, no official announcement has been made to support this understanding. Moreover, whether a 6 percent VAT rate is applicable to interest income remains debatable. While it is applicable based on the latest announcement by the People's Bank of China (Shanghai) in late 2017, it is not the common market understanding. It also remains unclear whether it is fully in line with an earlier release by the Ministry of Finance, which could be interpreted as meaning that all foreign income derived from China's interbank bond market is exempt from VAT (see "Supplement to VAT Application on Financial Institutions' Interbank Business" issued by the State Administration of Taxation in June 2016).

- *Tax exemption scope:* New uncertainties arose following the Chinese tax bureau's announcement on a three-year tax break for foreign investors' onshore bond investments:
 1. The definition of *bonds* that is covered by the tax exemption is unclear. *Bonds* is a generic concept in China that covers all instruments trading in the fixed income markets, as evidenced by the various reports and statements by the relevant Chinese authorities such as that from the People's Bank of China and CCDC. However, bonds could be interpreted in a much stricter way internationally, and tax advisors from international accounting firms typically take a narrower definition. Some of them views bonds as only one type of the many "fixed income instruments" or "debt instruments" that are trading in the fixed-income market in the international market. Because the tax exemption is only for bonds, the instruments that are not strictly classified as bonds may not be able to enjoy the same tax exemption.

2. Tax treatment for investments that crosses the three-year tax exemption period is unclear. Investors are unclear how tax treatment will be under the following situations: bonds purchased ahead of the exemption period but matures within the period (for example, investors who purchased a 5-year bond in 2015 that will mature in 2020); bond purchased ahead of exemption period and matures after the period (for example, investors buying a 10-year bond in 2015 that will mature in 2025); bonds purchased during the exemption period but will mature beyond the period (for example, buying a 10-year bond in 2019, which will mature in 2029). It remains unclear whether the tax exemption applies to only interest income during the 3-year period, or based on the purchase date, or based on the maturity date, of the investment. These uncertainties have considerably limited the ability for foreign investors to invest in longer dated instruments.
- *Tax calculation and collection:* Aside from tax rates, further details about tax calculation and collection are needed to clarify foreign investors' tax treatment.

With regard to calculating taxes, it remains uncertain whether taxes on interest income (after the current three-year tax exemption expires) are calculated on a cash basis (that is, deducted from full coupon upon coupon payment) or an accrued basis (that is, deducted based on actual interest income during the bond-holding period).

With regard to collecting taxes, it remains uncertain which entities will perform tax collection, when taxes will be collected, and what the payment frequency will be.

TABLE 11.1.

Comparing Foreign Access to Foreign Exchange, Interest Rate Derivatives, and Repo Markets in Select Asian Markets						
	Spot	Forward, Foreign Exchange Swap, Options	Currency Futures	Interest Rate Swaps, Cross-Currency Swaps, Bond Forward, Forward Rate Agreements	Bond Futures	Repo
China ¹ (currently included in none of the three indices) ²	Foreign investors can access onshore spot for onshore bond-related investments, but are not allowed to directly trade onshore spot without underlying bonds.	Investors can use onshore foreign exchange derivatives to hedge their foreign exchange exposure related to their onshore bond investments up to the tenor and amount of their onshore cash bond holdings. No approval or documentation support is needed, but onshore foreign exchange and derivatives have to be traded through one designated agent.	No onshore currency futures market in China.	Foreign investors can use onshore interest rate derivatives to hedge their onshore cash bond holdings up to the amount and tenor of their onshore cash bond holdings.	Available in China, but not accessible to foreign investors.	Available in China, but not accessible to foreign investors (only foreign public sector investors and RMB settlement banks can access inter-bank repo currently).

(continued)

TABLE 11.1. (continued)

Comparing Foreign Access to Foreign Exchange, Interest Rate Derivatives, and Repo Markets in Select Asian Markets						
	Spot	Forward, Foreign Exchange Swap, Options	Currency Futures	Interest Rate Swaps, Cross-Currency Swaps, Bond Forward, Forward Rate Agreements	Bond Futures	Repo
Malaysia (currently included in all three indices)	Foreign investors can access onshore spot market only if they have an underlying asset.	A nonresident institutional investor registered with the central bank is allowed to enter into forward contracts to sell Malaysian ringgit up to 100 percent (or buy Malaysian ringgit up to 25 percent) of its invested underlying Malaysian ringgit-denominated assets and unwind forward contracts without documentary evidence.	No onshore currency futures market in Malaysia.	Onshore interest rate swaps available for foreign investors as long as they have signed International Swaps and Derivatives Association (ISDA) agreements with onshore banks. They can only do cross-currency swaps with underlying assets, which is requested by regulators. Forward rate agreement market is illiquid.	Bond futures are available, but overall market depth is still underdeveloped.	Not available to foreign investors, as onshore banks cannot lend money to foreign investors via repo market.

(continued)

TABLE 11.1. (continued)

Comparing Foreign Access to Foreign Exchange, Interest Rate Derivatives, and Repo Markets in Select Asian Markets						
	Spot	Forward, Foreign Exchange Swap, Options	Currency Futures	Interest Rate Swaps, Cross-Currency Swaps, Bond Forward, Forward Rate Agreements	Bond Futures	Repo
Indonesia (currently included in GBI-EM and Global Agg)	Foreign investors can access onshore spot market only if they have an underlying asset. Nonresidents who sell Indonesian rupiah in excess of \$25,000 per month for spot are required to provide supporting documents.	Trade-by-trade supporting documents are required for nonresidents for all forwards, options, and foreign exchange swaps transactions.	No onshore currency futures market in Indonesia.	No market.	No market.	No market.
Thailand (currently included in GBI-EM and Global Agg)	Foreign investors can access onshore spot market. Total daily outstanding balances for a nonresident Thai baht (B) account and nonresident Thai baht account for securities each should not exceed B 300 million per nonresident.	Nonresidents can buy Thai baht, but the total outstanding balance for each domestic bank cannot exceed B 600 million per group of nonresidents. Nonresidents can sell Thai baht, but the total outstanding balance for each domestic bank cannot exceed B 10 million per group of nonresidents.	Foreign investors can access US dollar futures onshore.	Foreigners can access non-deliverable interest rate swaps (1–10 years) and US dollar/Thai baht cross-currency swaps (require a valid underlying position in domestic securities).	No market.	No market.

(continued)

TABLE 11.1. (continued)

Comparing Foreign Access to Foreign Exchange, Interest Rate Derivatives, and Repo Markets in Select Asian Markets						
	Spot	Forward, Foreign Exchange Swap, Options	Currency Futures	Interest Rate Swaps, Cross-Currency Swaps, Bond Forward, Forward Rate Agreements	Bond Futures	Repo
Korea (currently included in Global Agg)	Investors can access onshore spot without underlying assets if they open and register nonresident accounts. Further opening of investment account is required for trading financial assets. Notification is required for repatriation in excess of a limit.	Supporting documents required for nonresidents for all forwards, options, and foreign exchange swaps transactions to hedge foreign exchange exposure related to onshore bond investments.	Foreign investors can access US dollars, Chinese renminbi, Japanese yen, and euro futures to hedge their onshore bond investments.	Foreigners can access non-deliverable interest rate swaps (1–20 years), US dollar/Korean won cross-currency swaps (need an onshore Korean won account), and forward rate agreements.	Foreigners can access 3-year and 10-year Korean won futures.	Yes (as long as they have the bonds).
Philippines ³ (currently included in GBI-EM)	Foreign investors can access onshore spot market. Bangko Sentral Registration Document issued by the central bank is needed to sell Philippine pesos in the spot market.	Foreign investors can use forwards, foreign exchange swaps, nondeliverable forwards, and options to hedge their foreign exchange exposure.	No onshore currency futures market in the Philippines.	No. Interest rate swap market is very illiquid.	No market.	No market.

Source: Standard Chartered Research.

Note: GBI-EM = Global Bond Index–Emerging Markets; Global Agg = Global Aggregate Bond Index; repo = repurchase; RMB = renminbi.

¹ Foreign public sector investors (central banks, sovereign wealth funds, multilaterals) can freely access onshore repo, foreign exchange and foreign exchange derivatives, interest rate derivatives markets (except Chinese government bond futures) without restrictions.

² The three indices are JPMorgan Global Diversified Bond Index–Emerging Markets (GBI-EM), World Government Bond Index (WGBI), and Bloomberg Barclays Global Aggregate Bond index (Global Agg).

³ Philippines US\$-denominated sovereign bonds are included in Global Agg, but local currency–denominated Treasuries are not.

TABLE 11.2.

Type of Bond	For Domestic Investors		For Foreign Investors	
	Coupon	Capital Gains	Coupon	Capital Gains
	Income Tax + VAT	Income Tax + VAT	Withholding Tax + VAT	VAT
China government bonds	0% + 0%	25% + 6.34% for banks' or funds' self-owned positions; 0% + 0% for mutual funds; 0% + 3.26% for other funds	0% + 0%	0%
Local government bonds	0% + 0%	Same as China government bonds	0% + 0%	0%
Policy bank bonds	25% + 0% for banks' or funds' self-owned positions; 0% + 0% for both mutual funds and other funds	Same as China government bonds	10% (or lower subject to DTT) + 6.34%	0%
Negotiable certificates of deposit	Same as policy bank bonds	Same as China government bonds	10% (or lower subject to DTT) + 6.34%	0%
Corporate credit bonds	25% + 6.34% for banks' or funds' self-owned positions; 0% + 3.26% for both mutual funds and other funds	Same as China government bonds	10% (or lower subject to DTT) + 6.34%	0%

Sources: Ministry of Finance; and Standard Chartered Research.

Note: VAT itself is 6 percent, but there is a 12 percent local surcharge on VAT. Therefore, the effective tax rate is 6.34 percent, which is calculated as $6.34\% = 1/(1 + 6\%) \times 6\% \times (1 + 12\%)$. DTT = double tax treaty; VAT = value-added tax.

Suggestions

To resolve these issues, two steps could be taken:

- *Provide sufficient clarifications regarding foreign investors' current investments:* As these are very detailed considerations and more cases may emerge over time, the authorities may consider a question-and-answer format to openly clarify tax treatments for each case, and have the list extended over time. Examples of these cases include tax treatment on zero coupon bonds (such as negotiable certificates of deposit), tax treatment on previous bond investments (for example, tax clawbacks), tax treatment on bonds purchased during the exemption period but that will expire after the period (such as whether interest income will remain tax exempted after the three-year period if a 10-year nongovernment bond is purchased now), and so on.
- *Announce details of further tax treatment when the tax exemption period expires, including tax rates, calculation methodology, and collection methodology:*

A consolidated confirmation covering all types of bonds and all existing regulations on foreign investors' tax treatment will be needed to avoid confusion. And such details should be announced well ahead of the tax exemption period. These would allow all relevant parties—including foreign investors, custodian banks, and settlement agents and platforms—to get ready for the change in tax treatment, and ensure a smooth transition. Clarifications in future tax treatments are important to remove investor concerns about their investments in long-dated bonds that expire after the current tax exemption period.

Hedging Capacity in Practice, and Documentation Hurdles

Despite the rapid opening of China's onshore foreign exchange and interest rate derivatives markets, actual participation by foreign investors remains low. In theory, foreign public sector investors are allowed to access China's interbank foreign exchange and interest rate derivatives markets without restrictions; and foreign private sector investors are allowed to hedge their China foreign exchange and interest rate exposures in the onshore market, up to the amounts of their onshore cash bond holdings. In practice, however, only some foreign investors are able to access the onshore foreign exchange market, and few can access onshore interest rate derivatives markets at this stage.

Among foreign investors, asset managers—the key users of global bond indices—face the greatest hurdles. The ability to transact at onshore US dollar-to-Chinese renminbi (yuan) (USDCNY) rates (spot, forward, swap, options) are crucial to their investments in China onshore bond markets, as the pricing differences between the USDCNY and US dollar-China offshore spot markets are material. On the other hand, the ability to transact onshore interest rate derivatives, such as interest rate swaps, is considered “good to have, but not a must” at this stage, given that interest rate swaps are less efficient than Treasury bond futures for hedging cash bonds, and the offshore nondeliverable interest rate swap market is trading at similar levels as onshore interest rate swaps. Hence, the lack of practical accessibility to domestic foreign exchange markets is the key hurdle for global bond indices to include China onshore bonds currently.

Foreign Exchange Hedging

There are a number of practical hurdles:

- *The lack of capacity at global custodian banks:* Most global asset managers are tied to their global custodian banks for their China bond investments, in particular under the Bond Connect program. But most global custodian banks are not ready to offer onshore foreign exchange transactions at the time of writing, and it is unlikely that the majority of global custodian banks will become ready in the next one to two years. Without operational readiness at the global custodian banks, the vast majority of global asset managers can only fund and hedge their China onshore bond exposure via the China

offshore spot market, which has a far smaller funding pool, more volatile liquidity conditions, and usually higher hedging costs.

- *The necessity to sign new International Swaps and Derivatives Association (ISDA) Master Agreements:* Most global asset managers need to sign new ISDA agreements with a different subsidiary of their bond settlement agents in order to transact at the onshore foreign exchange market. This is a very time-consuming process, and has considerably delayed the timing of their China bond investments. For example, investors under the CIBM program typically need to sign a new ISDA agreement with the mainland subsidiary of their bond settlement agent, although many investors already have existing ISDA agreements with the banks' overseas entities. Similarly, investors under the Bond Connect program need to sign a new ISDA agreement with a settlement bank based in Hong Kong SAR, even if they already have an ISDA agreement with the same bank's other entities (such as a UK subsidiary or a Singapore subsidiary).
- *The unavailability of multiple foreign exchange counterparties:* Investors are keen to be able to trade with multiple foreign exchange counterparties to ensure best practice and more efficient pricing. Some even face hurdles in obtaining internal approval to invest in China onshore bonds for this reason. While this is not a determinant for global asset managers to start a position in China onshore bonds, it will definitely be a factor determining whether such investments will be done at scale over time.
- *The lack of clarity for the interpretation of exposure limits:* Under current guidance, the exposure of foreign private sector investors to onshore foreign exchange and interest rate derivatives cannot exceed their onshore bond holding positions. While the guideline appears to be straightforward, it is complicated in practice, as there are many ways to interpret it. Questions include whether foreign exchange exposure refers to net or gross exposure, whether foreign exchange forward-forward transactions are allowed, and whether the duration limit is on a bond portfolio or a specific bond. Without clarification from the regulators, market participants usually have to interpret these rules in the strictest possible way, and therefore sharply increase practical hurdles.

For example, exchange-traded fund bond funds commonly hedge expected currency exposure, such as from expected upcoming coupon payments, in advance. This cannot be done under the current guidance because foreign exchange exposure is calculated based on current bond holding positions. But allowing investors to hedge a certain amount beyond their current bond holdings would also create loopholes for investors that only intend to trade onshore foreign exchange without taking cash bond positions. Therefore, the most effective way to resolve such operational issues without creating loopholes is through a positive list outlining permitted behavior based on specific situations.

Interest Rate Hedging

De facto interest rate hedging ability is low for foreign investors in China's domestic market at this stage, owing to the lack of access to effective interest rate hedging tools (Treasury bond futures), the complexity of documentation, and mixed capabilities under different access programs. Only the CIBM program currently offers access to onshore interest rate derivatives upon signing of a National Association of Financial Market Institutional Investors (NAFMII) agreement. Conversations with international asset managers suggest that it is difficult for them to sign NAFMII agreements due to potential conflicts with their ISDA agreements for other markets. None of the other access programs—including Bond Connect, Qualified Foreign Institutional Investor (QFII), or Renminbi Qualified Foreign Institutional Investor (RQFII)—currently offer onshore interest rate hedging capacity. Accessible derivatives types are generally limited to interest rate swaps and cross-currency swaps, and few can access other derivatives—such as forward rate agreements and bond lending—at this stage. The most effective interest rate hedging tool—onshore China government bond (CGB) futures—is not available to foreign investors under any access program at this stage. And interest rate swaps have not historically been a very good hedging tool for China onshore cash bonds.

The lack of clarity on exposure limits for exchange rate derivatives above also exists for interest rate derivatives. Foreign institutions have to interoperate the general guidance the strictest possible way when no specific guidelines are offered. For example, foreign banks have been conducting onshore interest rate swap hedging on their onshore cash bond holdings issue by issue, with the corresponding interest rate swaps being up to the tenor and notional amount of the specific cash bond. It is practically very difficult to effectively hedge a bond portfolio this way.

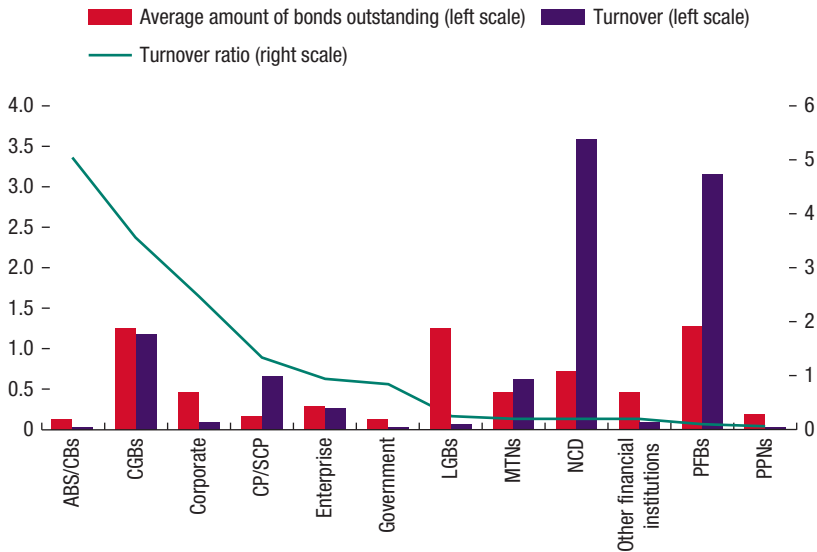
Suggestions

To resolve these issues, several steps would be helpful:

- *Establish a centralized foreign exchange registry system to maintain investors' cash bond and onshore foreign exchange exposure:* Such a system would allow foreign investors to trade onshore foreign exchange products with their existing counterparties, by passing the position limit control from the agent bank to the central bank. It will also bypass the current technical hurdles, including global custodian banks' lack of readiness and the necessity of signing new ISDA agreements with a new counterparty.
- *Allow an overall hedging limit at the investor or product level by combining all positioning under various programs instead of having the position limit calculated based on each program:* For example, if a fund product has access to onshore bonds under both the CIBM and Bond Connect programs, exchange rate exposure could be calculated based on combined cash bond positions held under both programs instead of having separate limits for positions under each program.

- Release a “positive list” for foreign exchange and interest rate exposure limits, to provide details on the types of activities allowed under various circumstances: Such a list would greatly increase clarity about what can and cannot be done under the current guidance. It would reduce the need for banks and market participants to interpret the requirements themselves, which has resulted in varying standards across the industry and overly stringent hedging practices. This list should be subject to regular review and additions as real cases emerge in practice.
- Accept ISDA agreements in addition to NAFMII agreements for private sector onshore interest rate derivatives transactions.
- Open up onshore China government bond futures to foreign investors for hedging purposes, with exposure limits similar to those for onshore interest rate swaps.
- Accelerate implementation of Bond Connect to allow access to onshore interest rate derivatives.

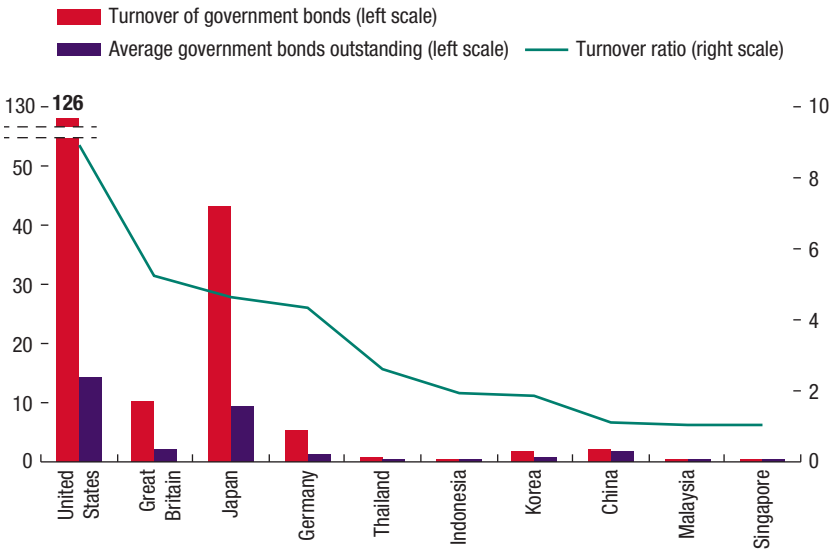
Figure 11.3. China Onshore Bond Turnover, Outstanding Bonds and Turnover Ratio, by Bond Type, 2017
(Trillions of renminbi; percent)



Sources: Standard Chartered Research; and WIND Economic Database (www.wind.com.cn).
Note: ABS/CBs = asset-backed securities/convertible bonds; CGBs = China government bonds; CP/SCP = commercial paper/short-term commercial paper; LGBs = local government bonds; MTNs = medium-term notes; NCD = negotiable certificates of deposit; PFBs = policy financial bonds; PPNs = private placement notes.

Figure 11.4. Global Government Bond Turnover, Outstanding Bonds, and Turnover Ratio, Global and Asian Peers, 2017

(Trillions of US dollars, left scale; percent, right scale)



Sources: AsianBondsOnline; China Central Depository and Clearing Corporation; Deutsche Finanzagentur; Securities Industry and Financial Markets Association; Standard Chartered Research; and United Kingdom Debt Management Office.

Insufficient Treasury Bond Liquidity

A sufficiently liquid secondary market is a key prerequisite for the Chinese government bond yield curve to become a representative benchmark for economic conditions and activity. While on-the-run China government bonds and policy financial bonds are already fairly liquid, gaps between on- and off-the-run bonds are wide (Figure 11.3), and the turnover ratio of China onshore bonds remains low relative to global and some Asian peers (Figure 11.4).

The lack of sufficient liquidity in the China government bond market is the second-biggest hurdle for China bonds to be included in global bond indices. Because of liquidity considerations, select global bond indices had suggested including only on-the-run China government bonds at the initial stage, but investor feedback suggests that this leads to frequent rebalancing of the portfolio and losses will be incurred as investors keep switching to new on-the-run bonds when existing holdings become off-the-run.

An improvement in onshore bond liquidity will require further diversification of market participants; further development of interest rate derivatives to allow more hedging and trading strategies, such as developing a liquid swap-spread market; wider participation in the bond repurchase (repo) market; and a less

fragmented onshore bond market. While these are mostly long-term issues that will take time to address, two technical adjustments to primary market mechanisms could lead to short-term improvements.

Suggestions

- *Issue more government bonds by retapping existing issues:* Authorities could increase primary issuance by reopening existing issues as much as possible, while reducing the number of new issues. They should also consider not only retapping a new issue shortly after issuance but also when it rolls into the next key tenor. This would help maintain the secondary liquidity of existing bonds over time; the relatively large issue size would support secondary liquidity even after the issue eventually becomes off-the-run. For example, authorities could retap a 1-year new issue at least three times after the original issuance: after issuance at the 1-year tenor, the issue can be reopened when its tenor reaches 9 months, 6 months, and 3 months (this is how US Treasury primary auctions work). Long-dated bonds, such as the 10-year benchmark, should be retapped many times to keep the bond on-the-run for a longer period of time, and for the issue size to grow to a sufficiently large to be able to retain reasonable liquidity even after it becomes off-the-run.
- *Reduce the number of key tenors:* The China government bond curve has a far larger number of key tenors than mature markets, such as US Treasuries. Short- to medium-term key tenors in China include 1-year, 3-year, 5-year, 7-year, and 10-year, while in the United States they are only 2-year, 5-year, and 10-year (although 3-year and 7-year US Treasuries are also issued). Similarly, long-dated China government bond issuance is spread over 15-year, 20-year, 30-year, and 50-year tenors, while the US market has only one key tenor (30-year) and no issuance in any other tenors. Having too many key tenors reduces the focus on each tenor and complicates trading strategies such as curve trades (for example, 10-year/2-year curve steepeners or flatteners), swap spreads (for example, 5-year interest rate swaps against China government bonds), and bonds against futures.

Authorities could gradually align China's key tenors with global convention by issuing more 2-year notes and reducing 3-year issuance and by moving some 7-year issuance to 5-year and 10-year. At the long end, this could be done by issuing only in the 30-year tenor and scrapping 15-year, 20-year, and 50-year issuance. Reducing the number of key tenors would concentrate activity in the remaining tenors and make these benchmark rates more representative. Investors could still gauge interest rates for the rest of the curve through interpolation for valuation purposes.

Need for Harmonization across Various Access Schemes

The complexity of China's access schemes and the frequent rollout of new schemes in isolation from existing ones are holding back investment by foreigners, according to feedback from international investors. Multiple access schemes not only create confusion, but also put early movers at a disadvantage—new programs are more flexible than the old ones, and there is no mechanism to transfer from old to new programs. Therefore, many investors prefer to delay investing until they feel that no more new programs will be introduced in the foreseeable future.

Four programs allow foreign investors to access China onshore bonds: QFII, RQFII, CIBM, and Bond Connect (Table 11.3). They vary widely in scope of accessible securities, repatriation rules, and hedging capacity. None of the new schemes were developed based on existing schemes, necessitating separate setup to access each new program.

- Bond holdings are not fungible across the various programs. Investors with access to more than one scheme cannot merge or transfer their security holdings between different programs.
 - Foreign investors intending to transfer bond holding positions under their QFII or RQFII accounts to their CIBM or Bond Connect accounts usually need to sell the bonds from the old accounts first and buy them back under the new accounts.
 - Bond holdings under the CIBM and Bond Connect programs are also not fungible for investors that have access to both. In particular, foreign exchange and interest rate hedging exposure limits are determined based on bonds held under each program, making it more difficult to transfer bonds across accounts.
 - In addition to requiring operational efforts, such transactions incur real economic costs.
- The programs differ materially in cross-border repatriation, account setup, and accessibility of onshore bonds, foreign exchange, and interest rate derivatives.
 - Investors can access both the interbank and exchange bond markets under the QFII and RQFII programs, but only the interbank bond market under the CIBM and Bond Connect programs.
 - Investors can access all interbank-traded foreign exchange and interest rate derivatives under the CIBM program within their position limits, but currently only the foreign exchange market under Bond Connect. QFII and RQFII investors just gained access to onshore foreign exchange but still do not have access to interest rate derivatives markets. They can access onshore equity futures, which are unavailable to CIBM and Bond Connect investors.

TABLE 11.3.

Comparison of Four Programs for Access to China's Onshore Bond Market				
		QFII/RQFII ¹	CIBM Direct	Bond Connect
Requirements	Approval versus filing	Approval	Filing	Filing
	Quota	Yes	No	No
	Lock-up requirements	No	No	No
	Cash Bonds			
	Interbank	✓	✓	✓
	Exchange	✓	×	×
	Bond repo	×	²	×
	Bond lending	×	✓	×
	Bond forward	×	✓	×
	Onshore Foreign Exchange			
Product Access	Spot	✓	✓	✓
	Forward	✓	✓	✓
	Swap	✓	✓	✓
	Options	✓	✓	✓
		Onshore Interest Rate Derivatives		
	Interest rate swaps	×	✓	×
	Cross-currency swaps	×	✓	×
	Forward rate agreements	×	✓	×
	CGB futures	×	×	×

Source: Standard Chartered Research.

Note: CGB = China government bond; CIBM = China Interbank Bond Market; QFII = Qualified Foreign Institutional Investor; RQFII = Renminbi Qualified Foreign Institutional Investor.

¹ The QFII and RQFII are two separate programs with different eligibility and setup. But the requirements in the above aspects under the two programs are the same.

² Overseas public sector investors, overseas participating banks, and renminbi clearing banks have access to the onshore repo market under the CIBM; private sector investors do not have access at this stage.

Suggestions

A step-by-step approach to consolidating existing programs and building on existing programs for future relaxation of foreign access is suggested, instead of starting entirely new programs.

- Allow equal access to onshore securities and derivatives, equal repatriation capabilities, and equal eligibility of foreign investors under existing programs.
- Set up a mechanism to allow easy transfer of securities holdings across programs, particularly from QFII and RQFII into CIBM and Bond Connect.
- Build on existing programs when opening onshore capital markets further to foreign investors, and avoid setting up new programs that are completely isolated from existing programs as much as possible. This would likely incentivize foreign investors to set up systems for accessing China's onshore markets now. Even if they consider the current level of market opening to be insufficient, these investors would enjoy a first-mover advantage on future market opening.

Allowing Nonfinancial Institutions Access to China's Onshore Markets

Current access programs—including QFII, RQFII, CIBM, and Bond Connect—allow only foreign financial institutions to access China's onshore bond markets. Conversations with global nonfinancial corporations suggest that they are keen to access the onshore bond market as an avenue for liquidity management. Some of these corporations have started to seek indirect access to the onshore bond market, for example, by setting up segregated accounts with an asset manager or via structured products such as total return swaps.

In addition, this restriction for participation by nonfinancial institutions has also led to unnecessary additional documentation requirements for applicants that are financial institutions. Conversations with investors and agent banks suggest that many applicants are struggling to provide supporting documentation for proof of being a financial institution, and that this has led to material delay and additional complications at the application process for both the CIBM and Bond Connect programs.

Suggestion

Broaden the scope of eligible foreign investors to include nonfinancial corporate institutions. This would provide an effective channel for corporations to deploy and retain renminbi funds derived from their China business without converting back into other currencies. This would not only lead to greater foreign inflows but would also broaden renminbi usage over time. Compared with financial institutions, corporations are usually less speculative and longer term in their investment behavior.

AREAS FOR IMPROVEMENT IN DOMESTIC PRODUCTS

This section discusses areas for potential further improvement in China's domestic bond and derivatives markets. We believe these improvements would make China's capital markets a better place for fundraising and investment and facilitate stronger and more sustainable foreign asset allocations.

The focus is on the following areas:

- Reducing the fragmentation of the bond market
- Correctly pricing credit default risk and improving creditor protection
- Further developing the interest rate swap market
- Improving the effectiveness of credit default risk hedging

Reducing the Fragmentation of the Bond Market

Market fragmentation has historically been a key hurdle to foreign investor understanding of and investment in China's onshore bond markets. Harmonization of rules and accessibility between the interbank and exchange bond markets is much needed. Notable differences exist between the interbank and exchange markets in market rules and participants. This fragmentation leads to unnecessary market complexity, creates room for regulatory arbitrage, and weakens the pricing power of benchmark yield curves.

- Credit bond issuance rules vary across issuance programs under different regulators, and the bonds are traded in different markets.
- Two repo markets operate in parallel in the interbank and exchange markets, with different trading mechanisms, counterparty risks, eligible participants, and haircuts.
- Fungibility between bonds trading in both markets is lacking. Only government and enterprise bonds can be traded in both markets, and moving bonds between the two markets is not straightforward.
- The supply-demand dynamics of the two markets are completely different, leading to different pricing for the same bonds in the two markets, and resulting in two different CGB yield curves.

Suggestion

Authorities could harmonize credit bond issuance programs across the various existing schemes—the enterprise bond program under the National Development and Reform Commission; the short-term commercial paper, commercial paper, and medium-term notes program under the NAFMII; and the corporate bond program under the China Securities Regulatory Commission—by setting the same issuance rules and allowing all bonds to be traded in both the interbank and exchange markets. Meanwhile, regulators could improve fungibility between the two markets by allowing the smooth transfer of bonds between them. Finally, authorities could either combine the various CGB yield curves or eliminate the less liquid ones and publish only one CGB benchmark yield curve to make it more representative and less confusing.

Pricing Credit Default Risk Correctly and Improving Creditor Protection

A mature credit bond market is not characterized by having no defaults. It means that a framework is in place that provides correct pricing of credit default risk, effective creditor protection, and an established mechanism to handle defaults. While credit bond defaults have started in China in recent years, there is no established framework for debt structuring or issuer liquidation. Similarly, while some bond covenants—such as cross-default clauses—have been put in place for

TABLE 11.4.

Agency	Market Share (%)		Regulatory Approvals			
	By bonds outstanding	By number of issuers	NAFMII	CSRC	NDRC	CIRC
	China Chengxin Securities Rating	30	24	✓	✓	✓
China Chengxin International Credit Rating			✓		✓	✓
China United Ratings	28	21		✓		✓
China Lianhe Credit Rating			✓		✓	✓
Dagong Global Credit Rating	23	14	✓	✓	✓	✓
Shanghai Brilliance Credit Rating	8	14	✓	✓	✓	✓
Pengyuan Credit Rating	8	20		✓	✓	✓
Golden Credit Rating	3	6	✓	✓	✓	✓
China Bond Rating Corporation		NA		NA		

Sources: Standard Chartered Research; and WIND Economic Database (www.wind.com.cn).

Note: CIRC = China Insurance Regulatory Commission; CSRC = China Securities Regulatory Commission; NA = not available; NAFMII = National Association of Financial Market Institutional Investors; NDRC = National Development and Reform Commission.

selected new issues, the covenants remain light relative to international peers and do not provide sufficient protection to creditors in their current form.

The credibility of the local credit rating system has been questioned by international investors, as domestic ratings are heavily skewed toward the upside, offer insufficient credit differentiation within each rating category, and do not provide red flags before actual defaults. For example, some issuers' local credit ratings were still rated AA before they announced missed payments. China's current set of domestic credit rating agencies is described in Table 11.4.

Aside from the historical lack of real defaults, these issues also result from the current market and regulatory framework:

- *Excessive competition in the credit rating industry:* China has too many credit rating agencies. At least eight domestic rating agencies are recognized by one or more regulators, compared with just three widely recognized rating agencies internationally. Investors see little differentiation among these agencies in credibility; issuers also do not differentiate between them as long as they are eligible to provide ratings under the issuer's targeted bond issuance program (Table 11.5).

The large number of eligible institutions and the issuer-paid credit rating model may result in an upwardly skewed credit rating distribution aimed at securing mandates, with eligible institutions offering higher ratings.

- *High regulatory rating requirements for credit bond issuance:* Given high credit rating requirements for domestic credit bond issuance, low ratings (AA– or below) are essentially useless in China—issuers with low ratings are unable to issue bonds under most existing bond issuance programs. For example, the China Securities Regulatory Commission requires a rating of at least AAA for public bonds issued to all investors; NAFMII requires a minimum rating of AA for short-term commercial paper issuers (Figure 11.10).

TABLE 11.5.

Rating Requirements for Issuers		
Regulator	Bond Type	Rating Requirements for Issuance
NAFMII	Short-term commercial paper	To register for issuance, corporations must provide two issuer credit rating reports by different agencies, with at least one rating of AA or above.
	Commercial paper	Issuer is required to be rated AA– or above.
	Medium-term notes	Issuer is required to be rated AA– or above.
	Special case	Issuers in the property sector must have listed A-shares and be rated AA or above.
NDRC		Compulsory explicit guarantee required for issuers of local government financing vehicles with debt-to-asset ratios of 65 percent or above, except AAA issuers with debt-to-asset ratios below 75 percent, and AA+ issuers with ratios below 70 percent.
	Enterprise bonds	Compulsory explicit guarantee is required for general corporate issuers with debt-to-asset ratios of 75 percent or above, except AAA issuers with ratios below 85 percent and AA+ issuers with ratios below 80 percent. Issuance is eligible for fast-track program if (1) issuer or issue is rated AAA; (2) it is guaranteed by a company rated AA+ or above; (3) bonds are rated AA+ or above and are guaranteed or pledged by valid assets; or (4) issuer is rated AA+ and has a debt-to-asset ratio below 20 percent.
CSRC	Corporate bonds	Only AAA rated bonds can be issued to all investors (including retail investors).
	Special case	Issuers in the property sector must be rated AA or above.

Sources: National Association of Financial Market Institutional Investors (NAFMII); National Development and Reform Commission (NDRC); China Securities Regulatory Commission (CSRC); and Standard Chartered Research.

This suggests that no issuers will accept an initial rating below AA–, thereby limiting the range of acceptable ratings to four notches at best—namely AAA, AA+, AA, and AA–. This is in contrast to the 16-notch scale in the international market, ranging from AAA to B– for most issuers (few issuers are assigned initial CCC category ratings).

Suggestion

Authorities could standardize the eligibility of rating agencies across regulators, reduce the number of eligible rating agencies, and remove credit rating requirements for issuance across all programs. These steps would reduce issuers' scope to select between agencies and widen the range of eligible and acceptable credit ratings to allow greater credit differentiation. Less intense competition would reduce the need to offer inflated credit ratings, improving rating agencies' credibility over time. The removal of rating requirements at issuance would allow more room for credit differentiation. It is the view here that all issuers should be allowed to issue; whether such issuance can successfully come to the market

should depend on whether credit risks are correctly priced in and the borrowing terms offer sufficient creditor protection. Investors rather than regulators should determine both.

Further Developing the Interest Rate Swap Market

China interest rate swaps are among the most popular products for investors to express views on the direction of China's interest rates and manage interest rate risk. However, the large number of floating-rate legs and the lack of direct linkage to financing costs in the real economy have hindered the development of this market.

The China interest rate swaps market has many more floating-rate legs than most G10 markets. Compared with the typical floating-rate legs of 3-month London interbank offered rate (Libor) or 6-month Libor in the US market, China has interest rate swaps based on the following floating-rate legs:

- 7-day repo fixing for transactions across all financial institutions
- 7-day repo fixing for transactions among deposit-taking institutions
- 3-month Shanghai interbank offered rate (Shibor)
- Overnight Shibor
- People's Bank of China benchmark deposit rate
- People's Bank of China benchmark lending rates
- Loan prime rate

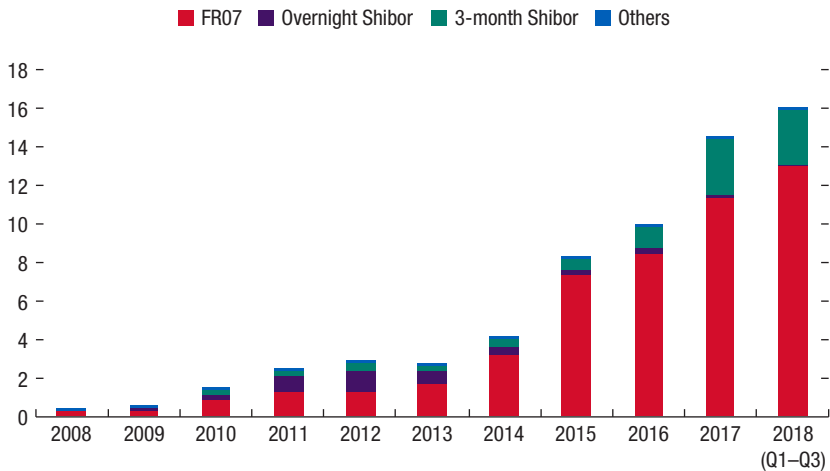
However, the pricing of assets and liabilities in China's financial system is not yet based on interbank rates (such as Shibor). Banks' liabilities are determined by a combination of the policy rate (People's Bank of China [PBC] benchmark deposit rate) and interbank rates (PBC open-market operation rate, medium-term lending facility rate, secondary 7-day repo rates). Corporate liabilities are mostly benchmarked against PBC benchmark loan rates; no loans are priced over 7-day repo rates and few are priced over Shibor or loan prime rates.

Despite the large number of floating-rate legs, there is no natural need for banks to swap from fixed-rate assets into floating-rate assets, or for corporations to swap from floating-rate loans into fixed-rate loans—the key function of interest rate swaps in the real economy.

Suggestion

Authorities could focus on developing just two interest rate swaps markets, namely 7-day repo and 3-month Shibor-based interest rate swaps, and gradually eliminate additional curves. Further liberalization of interest rates will likely lead to a gradual shift of banks' funding costs to interbank from retail deposit rates. This is likely to result in a gradual shift of bank loan pricing from current PBC benchmark lending rates to an interbank rate, most likely 3-month Shibor. The availability of liquid 7-day repo and 3-month Shibor-based interest rate swaps markets

Figure 11.5. Breakdown of China Interest Rate Swap Turnover, by Type of Floating Leg, 2008–18
(Trillions of renminbi)



Sources: Standard Chartered Research; and WIND Economic Database (www.wind.com.cn).

Note: FR07 = 7-day repo fixing for transactions across all financial institutions; Shibor = Shanghai interbank offered rate.

would be key in making it easier for banks and corporations to swap between fixed- and floating-rate assets and liabilities.

Improving the Effectiveness of Credit Default Risk Hedging

China's regulators have introduced various credit derivatives in the onshore market since 2010, but market development has been very slow. Credit default mitigation was introduced in 2010, and China's credit default swap (CDS) market was introduced in September 2016. An active CDS market not only offers effective tools for credit risk management, but also facilitates credit pricing discovery. Several fundamental issues have hindered the development of this market:

- *There are no standardized contracts:* Currently, only primary dealers are eligible issuers of “certificate-based” credit derivatives, including credit risk mitigation warrants and credit-linked notes. All other market participants can either buy such certificate-based credit protection or enter into bilateral agreements for “contract-based” credit protection that are not tradable in the secondary market, such as CDS and credit risk mitigation agreements. Many of China's CDS contracts target a specific debt issue, rather than an issuer. There also exist no standardized contracts at this stage. Comparatively, international CDS contracts are usually issuer based, and standardized (such as 5-year China sovereign CDS). The issue-based nature and the lack of a

standardized format have led to a lack of liquidity in the secondary market, preventing pricing discovery and reducing both the demand and the supply of credit derivatives products.

- *The definition of credit event is vague:* Existing guidelines do not specify triggers for credit events. The lack of bond covenants, such as cross-default clauses (which remain uncommon despite having been introduced in recent years) and well-established default and liquidation procedures, creates further complications. These uncertainties further reduce the incentive to buy credit protection.

Suggestion

Focus on standardized credit derivatives contracts that are issuer based (rather than issue based) and that can be easily traded in the secondary market, similar to the 5-year CDS contract in the international market. A mechanism should be created to ensure ongoing issuance of on-the-run contracts (for example, issuing a new 5-year contract every half year) and allow easy transition from off-the-run contracts to on-the-run ones (for example, by paying a spread).

The availability of standard and issuer-based contracts would ensure ongoing liquidity availability and comparability for these products and would likely boost activity in the secondary market. An active secondary market is crucial for price discovery, and is fundamental for a material increase in both supply of and demand for credit derivatives in China. It greatly increases banks' and investors' incentives to trade credit protection, even when there is no imminent default risk.

CONCLUSIONS

The key hurdles to foreign investors' access to China's domestic bond market are practical rather than regulatory. Resolving these issues in a timely manner, while avoiding introducing new uncertainty and practical hurdles as capital markets are opened further, is crucial to securing international investors' commitment to China's capital markets.

This chapter suggests that the authorities place greater importance on practical and operational considerations, in addition to capital market and regulatory issues, in future policymaking. The authorities should aim to ensure that practically viable solutions are available upon further opening of capital markets, or at least provide an interim solution. The authorities might want to consider the benefits of broadening the dialogue with market participants, particularly intermediaries such as commercial banks and global custodians, to identify practical issues and arrive at operational solutions as they open up domestic capital markets further.

Specific rules and guidelines for what can and cannot be done would provide more clarity and reduce room for interpretation by the industry. In the current increasingly stringent regulatory environment, general guidance is interpreted as

strictly as possible by market participants, making it difficult—if not impossible—to perform investment and hedging activities. To resolve these issues, it would be useful for the PBC to publish positive lists of the practices allowed under each scenario based on real business cases, and update the lists regularly as new cases emerge. In addition, the authorities could publish case studies to clearly illustrate the required processes for application, investment, repatriation, and hedging. Experience shows that case studies are among the most effective tools for clarifying rules and procedures, leading to faster take-up by the industry. To minimize start-up costs, the authorities might consider building upon existing platforms when further opening up domestic markets.

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Patterns of Trading in China's Bond Market

Tobias Adrian, Henry Hoyle, and Fabio M. Natalucci

Because of unusual structural features of China's financial system, periods of tightening in monetary and funding conditions in China tend to be associated with declines in trading volumes in the bond market. This periodic deterioration in market depth represents an amplification mechanism that can potentially exacerbate adverse shocks, leading to procyclicality of trading and funding market conditions. Authorities have injected liquidity to limit this vulnerability and avoid a pernicious tightening cycle. Such liquidity injections help stabilize markets but reinforce the perception of implicit guarantees (see Chapter 13 on implicit guarantees). Improving bond market liquidity will help ease this trade-off and should be an important part of the agenda to tackle financial vulnerabilities. The increased presence of international investors in China's bond markets is expected to improve market liquidity.

Low trading liquidity, as measured by the turnover ratio, is a well-known characteristic of the Chinese bond market.¹ This chapter expands on this observation by documenting the considerable cyclicity of Chinese bond market liquidity, linking it to unique aspects of China's financial system, in particular the prevalence of off-balance-sheet investment vehicles like bank wealth management products (IMF 2018a). The chapter also discusses associated financial stability risks (see also Chapter 10 on financial stability) and provides policy recommendations.

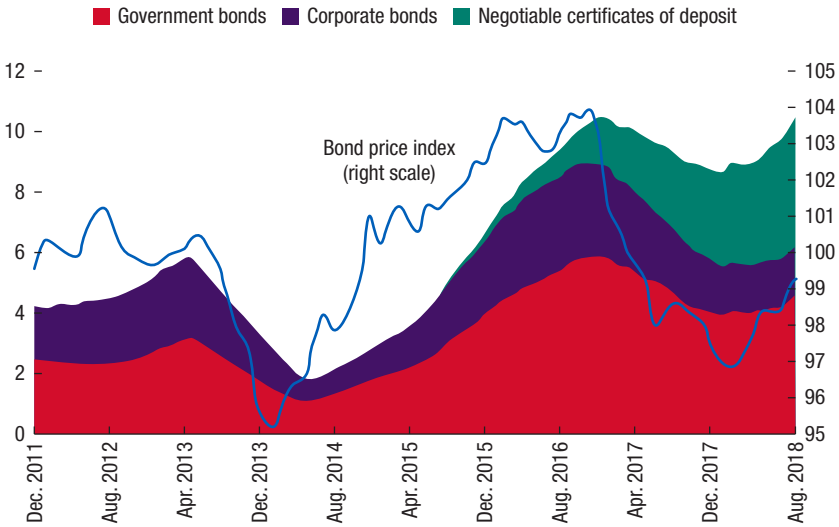
LIQUIDITY AND FUNDING CONDITIONS IN CHINA'S BOND MARKET

Trading activity in China's nearly RMB 80 trillion (\$12 trillion) bond market, the world's third largest, is quite volatile by international standards. Trading in Chinese government bonds and policy bank bonds (collectively known as "rates bonds") and corporate bonds ("credit bonds") fell sharply in mid-2013 and then

The authors are grateful to Li Yang for her excellent support on data issues.

¹ Turnover ratio is defined as the ratio of trading volume to total bonds outstanding.

Figure 12.1. Bond Market Trading Turnover and Bond Prices, 2011–18
(Trillions of renminbi; price index, Dec. 2011=100)



Sources: CEIC; ChinaBond; and authors' calculations.

Note: Turnover is a 12-month moving average. Government bonds include policy bank-issued bonds.

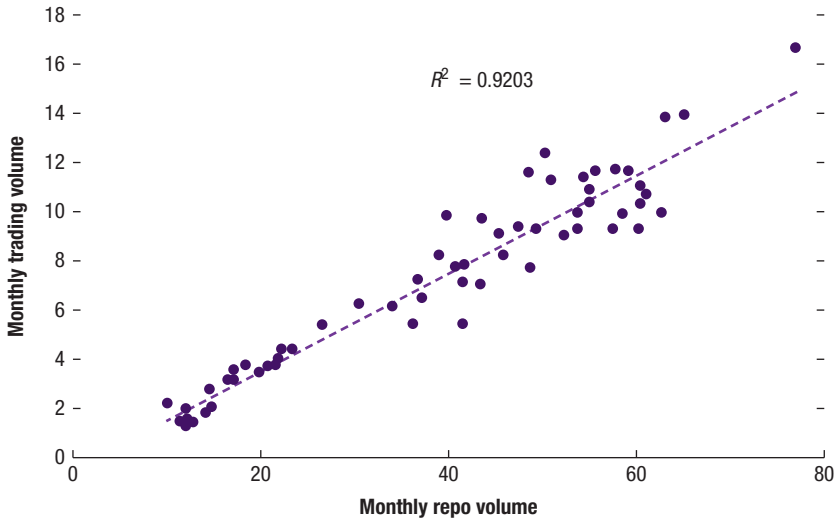
again in late 2016.² These episodes were associated with a sharp drop in bond prices (Figure 12.1).³ These declines in trading volumes have recently been partly offset by the rise in trading of short-term bank-issued debt instruments known as negotiable certificates of deposit (discussed later in the chapter). While many metrics of bond market liquidity indicate that conditions have improved in recent years, rapid shifts in trading volumes suggest that market liquidity is not as robust as some of these metrics may suggest.

In particular, sudden shifts in trading volumes may pose financial stability risks. Bond trading is closely linked to borrowing activity in China's bond repurchase (repo) market, in which volumes are much higher and which is dominated by demand from investment vehicles and, to a lesser degree, smaller banks (Figure 12.2). As most borrowing in this market is at one- and seven-day

² Rates bonds account for roughly one-third of Chinese bond market debt outstanding, and largely trade in the over-the-counter interbank market—which, despite its name, is open to most nonbank financial institutions. Credit bonds account for another third of bond market debt outstanding and include mainly medium-term notes, corporate bonds, and enterprise bonds, and trade in both the interbank and exchange-listed markets. The other third of the bond market in stock terms comprises local government bonds, which are traded in negligible amounts, and issuance by financial institutions, including short-term bank instruments, such as negotiable certificates of deposit.

³ These time periods were two notable periods of bond market stress: the widely reported interbank repo market crunch of June 2013 and the Sealand Securities fraud in December 2016.

Figure 12.2. Interbank Bond Repo Market and Trading Turnover, 2013–18
(Trillions of renminbi)



Sources: Bloomberg L.P.; CEIC; and China Foreign Exchange Trade System.
Note: Data shown are from June 2013 through July 2018.

maturities, this suggests that most bond transactions are financed with short-dated leverage. This means trading activity is exposed to maturity and liquidity transformation risks and may be sensitive to shifts in funding conditions. As explored later in this chapter, links between bond and repo market activity may result in a feedback loop and amplify shifts in broader financial conditions.

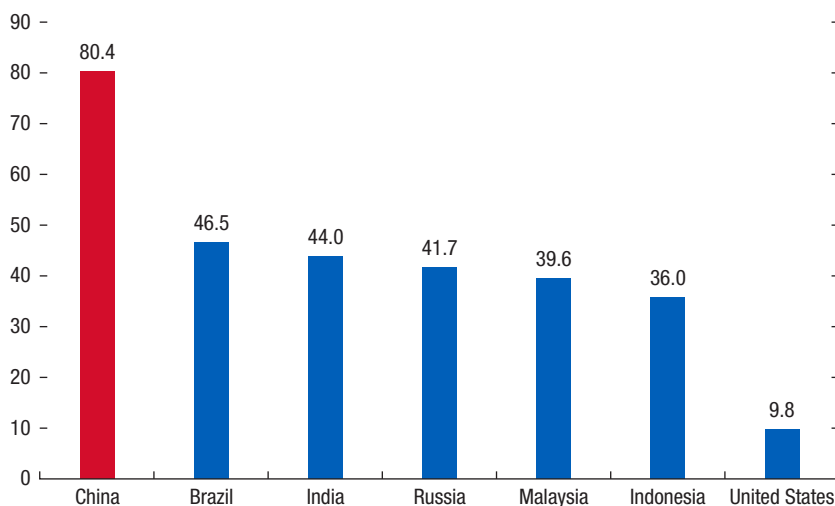
SHIFTS IN TRADING VOLUMES IN AN INTERNATIONAL CONTEXT

A comparison with other bond markets suggests that trading conditions in China are unusual in several respects. In particular, turnover is highly volatile and bond prices and trading volumes show a clear positive relationship.

Trading volumes in China shift much more rapidly and persistently than in other bond markets. The interquartile range of China's monthly government bond trading volumes over the last five years is 80 percent of the average monthly volume during the same period. This is almost double the range of the next-closest emerging market bond market peer, and eight times the range of variation of trading volumes of the US Treasury market (Figure 12.3).

Large shifts in trading activity in China's bond market are also evident in turnover ratio terms. The turnover ratio in the Chinese government bond market

Figure 12.3. Government Bond Trading Volume: Five-Year Interquartile Range (Percent)



Sources: Bloomberg L.P.; Brazil's Tesouro Nacional; CEIC; and Haver Analytics.

Note: Data shown are the five-year interquartile ranges of monthly government bond trading volumes (through June 2018, or latest), expressed as a percentage of the period average trading volumes.

is much lower than in the United States, and much more volatile (Figure 12.4).⁴ For example, the turnover ratio fell by over half around mid-2013 and the end of 2016 (Figure 12.4, panel 1). In the Chinese corporate bond market, the turnover ratio was notably elevated before the 2013 interbank liquidity shortage episode, but it has fallen sharply, reflecting both lower volumes and continued rapid growth in corporate debt outstanding (Figure 12.4, panel 2).⁵

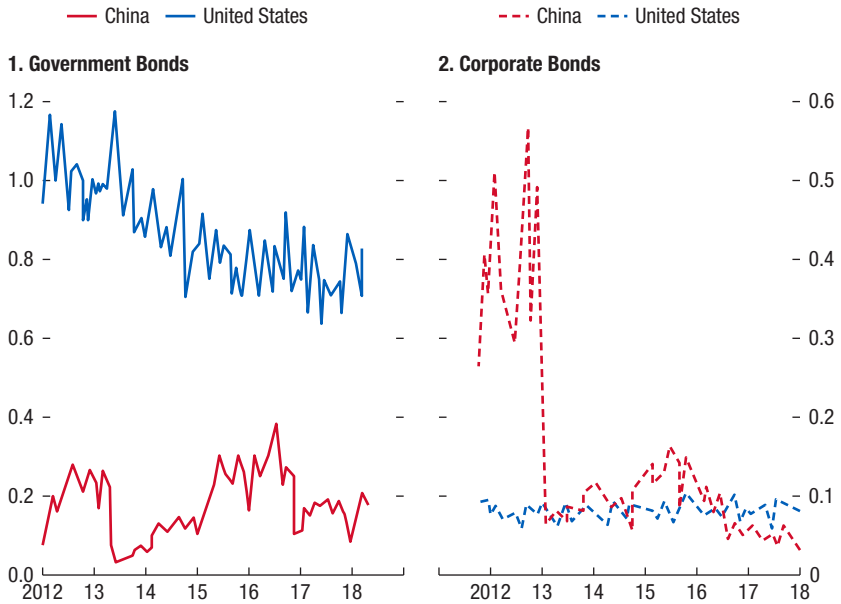
Another unusual aspect is the positive (negative) relationship between trading volumes and bond prices (yields) overall. In China, bond trading volumes generally rise in sync with bond prices (as measured by bond price indices), particularly for corporate bonds, where the regression slope is steeper (Figures 12.5 and 12.6). By contrast, this price-volume relationship does not appear to be meaningful in the United States.

One possible interpretation of this finding for China is that when bond yields rise, most market participants are unable or unwilling to purchase the higher-yielding bonds, perhaps because of funding or liquidity constraints. Another

⁴ The falling turnover ratio in US government bonds mostly reflects rising stock; trading volumes reported by primary dealers have remained relatively stable through this period on a trend basis, although market observers note this probably does not capture rising trading conducted by high-frequency market makers.

⁵ The low turnover ratio in the Chinese government bond market is less unusual compared to many other smaller emerging market local currency government bond markets; however, it is among the lowest when considering bonds issued only by the central government.

Figure 12.4. Turnover Ratio, by Bond Type, China and the United States, 2012–18
(Percent)



Sources: CEIC; and Haver Analytics.

Note: The data show the monthly trading volume divided by the total stock outstanding.

interpretation is that few market participants are willing to sell bonds at that level, perhaps to avoid recognizing a loss. Structural and institutional features of China's bond market discussed in the next section suggest that both of these factors may play a role.

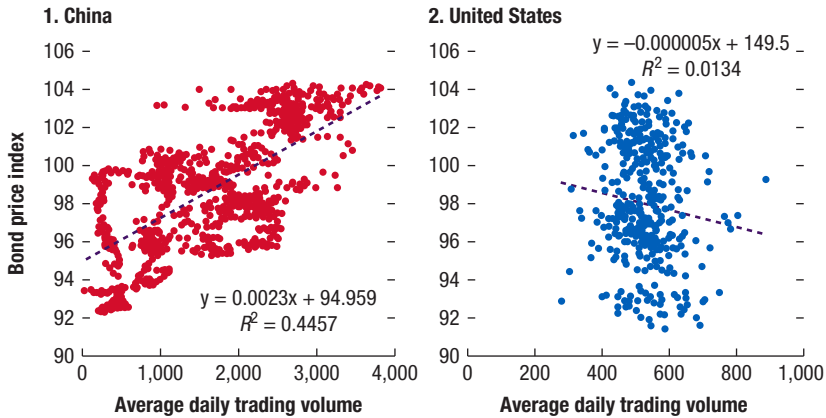
MARKET STRUCTURE FEATURES

Several market structure features probably contribute to the documented large swings in trading. One is the prevalence of carry-trade-type activity, in which leverage is commonly used for long positions but is difficult to use for short positions.⁶ Another is the lack of hedging by market participants, reflecting the scarcity of appropriate hedging instruments. A third and more general factor is related

⁶ A carry trade is a strategy in which an investor borrows money at a low interest rate (typically at a short maturity) to finance a purchase of an asset that is expected to provide a higher return. A long position means an investor *owns* an asset (or the right or obligation to purchase an asset at a certain price), and gains from an increase in its value. A short position means an investor *owes* an asset to a third party (or has the right or obligation to sell an asset at a certain price), and gains from a decrease in its value.

Figure 12.5. Government Bond Trading Volumes and Index Price, China and the United States

(Price index; trading volume in 100 millions of renminbi and billions of US dollars)

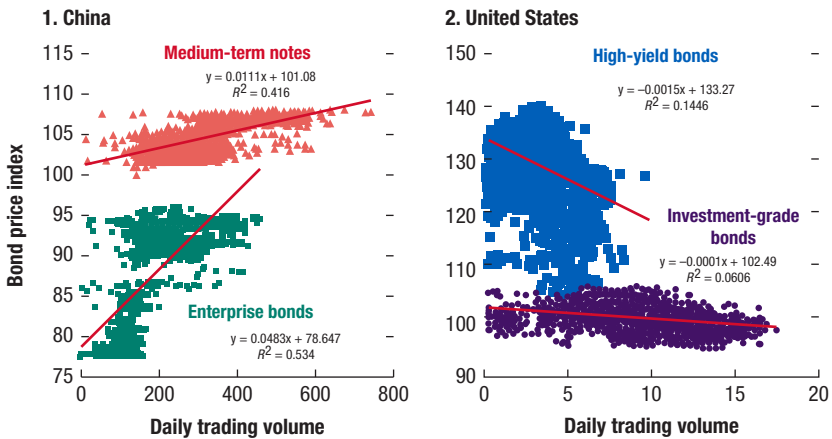


Sources: Bank of America Merrill Lynch; Bloomberg L.P.; CEIC; and ChinaBond.

Note: For China, price index and trading volume data include policy bank bonds, and trading volumes are 5-day averages. For the United States, government bond trading volumes are weekly averages of daily trading from July 14, 2010, through July 11, 2018.

Figure 12.6. Corporate Bond Trading Volumes and Index Price, China and the United States

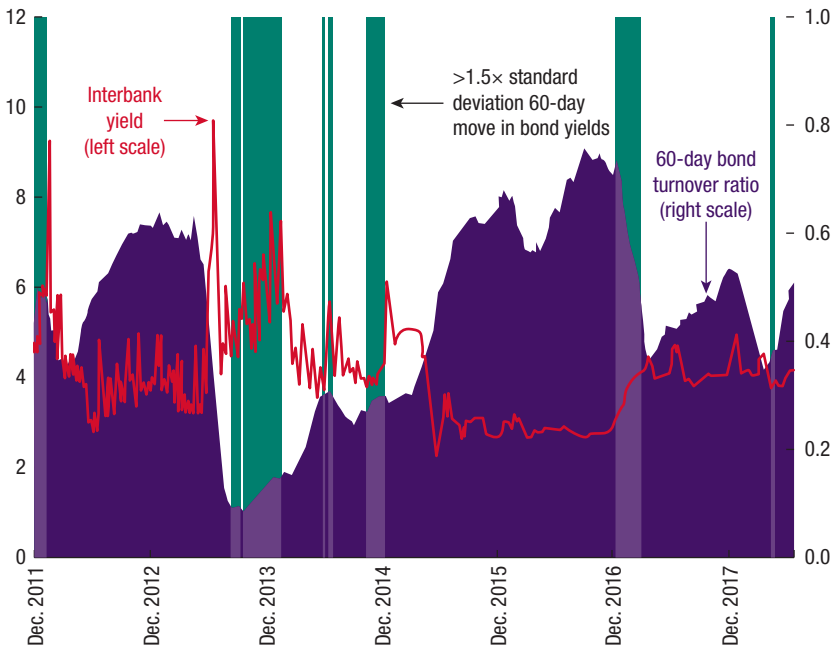
(Price index; trading volume in 100 millions of renminbi and billions of US dollars)



Sources: Bloomberg L.P.; CEIC; ChinaBond; and Financial Industry Regulatory Authority.

Note: For China, data cover January 6, 2014, through July 25, 2018. For the United States, data cover December 28, 2011, through July 11, 2018.

Figure 12.7. Bond Turnover and Interbank Yields, 2011–18
(Percent; 60-day turnover)



Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Note: The interbank yield is the 1-month Shanghai interbank offered rate (Shibor). Bond turnover is the 60-day sum of the daily bond turnover rate. Bond turnover and yield data are based on government and policy bank bonds.

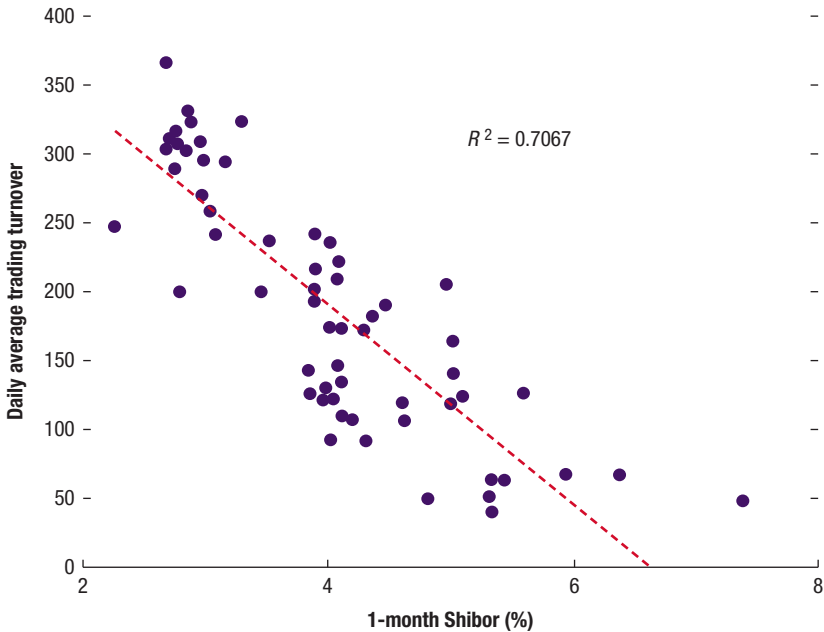
to the reliability of market pricing, reflecting the lack of centralized market making. As a result of all these factors, the Chinese bond market typically experiences one-way positioning during stable or declining interbank interest rates. However, when interbank interest rates tighten, or bond prices are more volatile, trading volumes tend to fall sharply (Figure 12.7).

Evidence of Speculative, Carry-Trade-Type Activity

Shifts in volume occur in part because much trading activity appears to reflect cycles of carry trades, where the most common form of leverage can be used to finance purchases of bonds. As noted, interbank trading volumes are tightly correlated with repo market volumes (Figure 12.2). This is unlikely to reflect market-making activity, as repo volumes are several times larger than spot transactions and most repo collateral is “pledged” and therefore cannot be reused for sale.⁷ In addition, given the “pledged” nature of most repo borrowing, only bond

⁷ The correlation holds when excluding bond purchases and repo borrowing volumes by securities firms, which also suggests the relationship is not due to market-making activity.

Figure 12.8. Daily Average Trading Volume and Interbank Repo Rates, 2013–18
(Trillions of renminbi; percent)



Sources: Bloomberg L.P.; CEIC; and China Foreign Exchange Trade System.

Note: Data are monthly. Trading data exclude bonds with maturities of one year or less.

Shibor = Shanghai interbank offered rate.

buyers can cheaply borrow cash to purchase more bonds. By contrast, sellers cannot easily borrow bonds to short.

Because most purchase transactions are financed with short-term borrowing, activity is sensitive to shifts in interest rates. Trading volumes tend to be lower when interbank interest rates are higher, and vice versa (Figure 12.8).⁸

Recently, one factor contributing to weaker market trading for government and corporate bonds has been the increased trading of negotiable certificates of deposit. This is evident in the rapid shift in the maturity composition of trading activity away from bonds with maturities above one year (Figure 12.9). This development may reflect increased trading by money market funds, which have grown rapidly since 2015. It may also reflect the possibility that during periods of higher interest rates, leveraged bond buyers prefer the shorter duration and

⁸ Notably, this relationship is stronger for bonds with a maturity of less than one year (R^2 equals 0.71, shown) than for all bond trading (R^2 equals 0.45, not shown). Trading in bank-issued negotiable certificates of deposit, which make up the bulk of trading for bonds with maturities less than one year, is positively correlated with interbank rates (R^2 equals 0.28).

Figure 12.9. Share of Interbank Trading of Bonds with Maturity above 1 Year, 2011–18
(Percent)



Source: CEIC.

higher turnover of negotiable certificates of deposit, which expose their carry trade to less maturity and liquidity mismatch risk. As trading in negotiable certificates of deposit has grown to many multiples larger than trading in equivalent-maturity government instruments, this phenomenon may also be weakening price discovery at the short end of the risk-free yield curve.

Lack of Hedging by Market Participants

While the Chinese authorities have successfully established several liquid hedging markets, there are several important limitations to their effectiveness for market participants. The Chinese government bond futures market, discussed in detail in Chapter 8, lacked a short-tenor instrument until August 2018. It also does not allow participation by banks, which are the dominant players in the cash market, accounting for around 80 percent of Chinese government bond holdings and net purchases. The Chinese government bond futures market comprises primarily investment vehicles and other nonbanks, which mostly hold shorter-duration credit bonds.

The interest rate swap market also provides limited hedging benefits to bond investors. Most swap volume is at the 1-year tenor, while the bond market average

maturity is around 2–3 years for credit bonds and 6 years for government bonds. Significant trading volumes in the interest rate swap market may be driven by flows hedging or speculating on the floating rate leg (either the 7-day repo rate or the Shanghai interbank offered rate [Shibor]), which are more volatile than in other major markets because of the ongoing quantity orientation of aspects of the People's Bank of China's monetary policy framework (see Chapter 14). In addition, because few financial assets or liabilities are explicitly tied to either the 7-day repo rate or Shibor, the interest rate swap market also lacks liquidity provided by firms or banks with nonspeculative hedging needs.

Bond repo agreements, credit default swaps (CDS), and other tools regularly used to hedge or short interest rate risk in other developed bond markets are available, but little used, in part because of regulatory uncertainty.⁹ As noted, the repo market, a key hedging tool for market makers in other markets, is mostly conducted on a “pledged” basis. As a result, cash lenders are precluded from selling the received bond collateral, a step necessary to create an effective short position. The size of the outright repo market, where such rehypothecation of collateral is possible, is comparatively small. Forward contracts, securities lending, and CDS contracts have all been launched but take-up has been low. One reason commonly cited by market participants is the lack of legal certainty around “close-out netting” in the bankruptcy regime and for bank regulatory purposes. This means that exposures between two counterparties cannot be recognized on a net basis but instead need to be accounted for on a gross basis, a restriction that limits a financial institution's ability to use collateral to offset credit exposure and to reduce counterparty credit-related capital requirements.

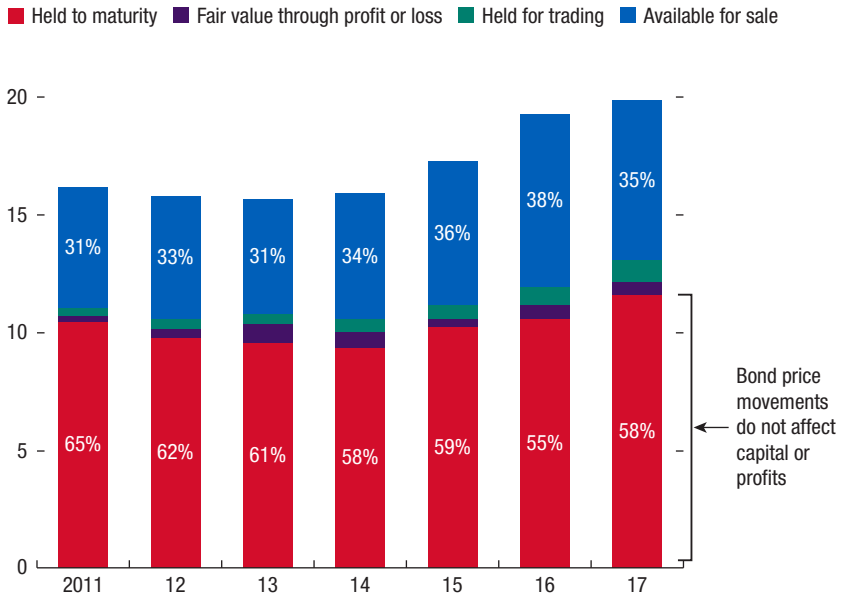
Other Factors Contributing to Fluctuations in Trading

Banks and investment vehicles, the largest investors in the bond market, lack incentives to actively hedge because they often hold bonds to maturity and do not mark their holdings to market. Chinese commercial banks classify about 60 percent of bond investments as held-to-maturity (Figure 12.10), compared to less than 10 percent for most developed-economy banks. Bank wealth management products and other investment vehicles, the dominant investors in credit bonds and the second-largest investors in government bonds, do not publish net asset values.¹⁰ Evidence suggests that these vehicles meet redemption pressures largely via short-term collateralized borrowing, rather than asset sales in the open market. Investment vehicles appear to be among the least active traders of rates bonds as measured by total trading volumes relative to holdings in the interbank

⁹ CDS were introduced in October 2016 by the National Association of Financial Market Institutional Investors (NAFMII), an industry group affiliated with the People's Bank of China, along with another tool called credit-linked notes. Together with the credit risk mitigation agreement and credit risk mitigation warrant (both introduced in 2010), they form the credit risk hedging tools in the Chinese bond market. Bond repos were introduced in the early 1990s. Government bond futures were suspended in 1995 and reintroduced in 2013.

¹⁰ For more on investment vehicles and their bond market holdings, see IMF (2018a).

Figure 12.10. Bank Bond Holdings by Accounting Classification, 2011–17
(Percent of sample bank assets)



Sources: S&P Global Market Intelligence; and authors' calculations.

Note: Based on annual report data for a sample of 61 Chinese commercial banks with RMB 165 trillion in assets as of the end of 2017 (84 percent of total commercial bank assets).

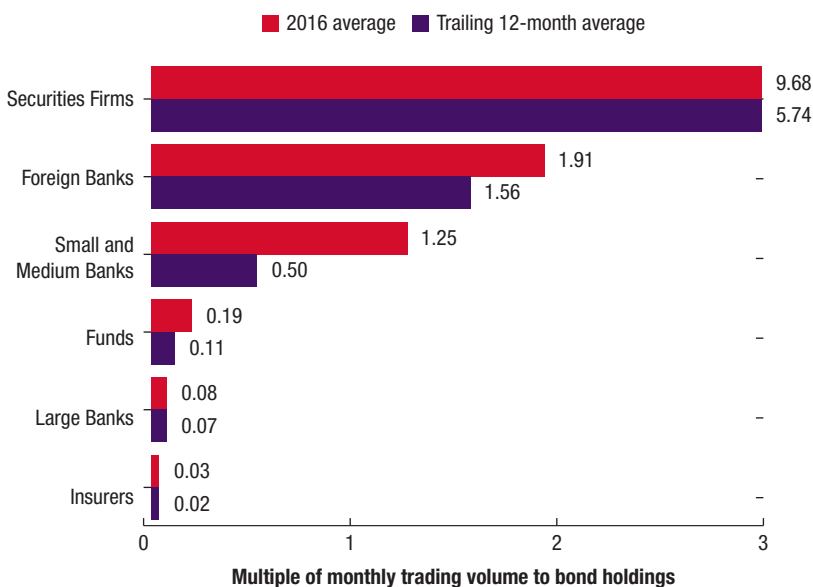
market (Figure 12.11; note that investment vehicles are represented under "Funds," where they account for the majority of assets held).¹¹

Reflecting drawbacks in available hedging markets, China's bond market also lacks the centralized market-making structure common in other advanced markets, where broker-dealers linked by an interdealer market dominate trading activity. Securities companies account for only 24 percent of bond trading, compared to broker-dealers' 62 percent share of trading in the United States (Figure 12.12). The robust interdealer market provides important benefits to secondary-market liquidity and continuous pricing by providing incentives for dealers to give quotes that accurately reflect broader market pricing (Viswanathan and WANG 2004).

Price discovery is also weakened by the lack of a deep, liquid benchmark yield curve. In part reflecting the dominant position of banks in the Chinese government bond market, other de facto alternative risk-free yield curves are more widely used. Policy bank bond trading volumes are three times higher than those of Chinese government bonds, have tighter bid-ask spreads, and are traded by a

¹¹ This assessment is based on the portion of the interbank market registered with the China Central Clearing and Depository Corporation, which includes all trading of government and policy bank bonds.

Figure 12.11. Monthly Turnover Ratio by Market Participant Type: 2016 and 12 Months through August 2018
(Multiple)



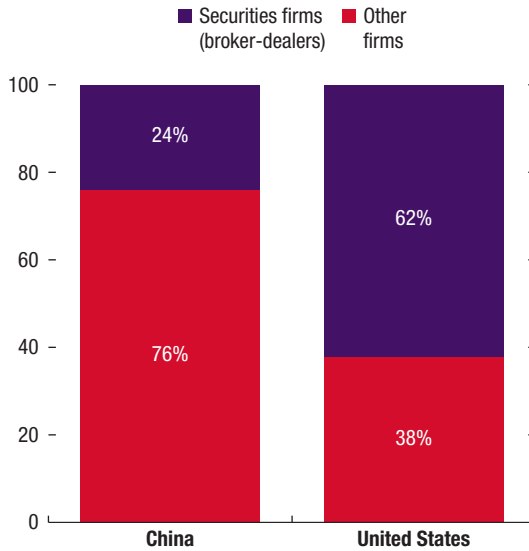
Sources: CEIC; and China Central Depository and Clearing Co., Ltd.

Note: Data shown are averages of each market participant type's monthly trading volume divided by month-end bond assets. Data are based on China Central Depository and Clearing Co.-registered bond holdings and trading activity. "Funds" includes investment vehicles. Trailing 12-month average is from September 2017 through August 2018.

wider array of market participants. At shorter tenors, bank-issued negotiable certificates of deposit are traded three to four times more than all other short-tenor instruments combined, and those issued by large national banks are seen as effectively risk-free because of perceived implicit guarantees.¹² This lack of a single, strong benchmark yield curve makes it difficult for market participants to accurately value bonds or hedge their portfolio risks using existing hedging instruments. It also impedes the transmission of monetary policy, because risk-free yields are often heavily influenced by issuance of negotiable certificates of deposit or other factors that affect interbank liquidity conditions.

¹² Adding to the problem, there are alternative Chinese government bond and policy bank curves on the exchanges.

**Figure 12.12. Bond Trading by Firm Type,
United States and China, 2017**
(Percent)



Sources: CEIC; China Central Depository and Clearing Co., Ltd; and Haver Analytics.

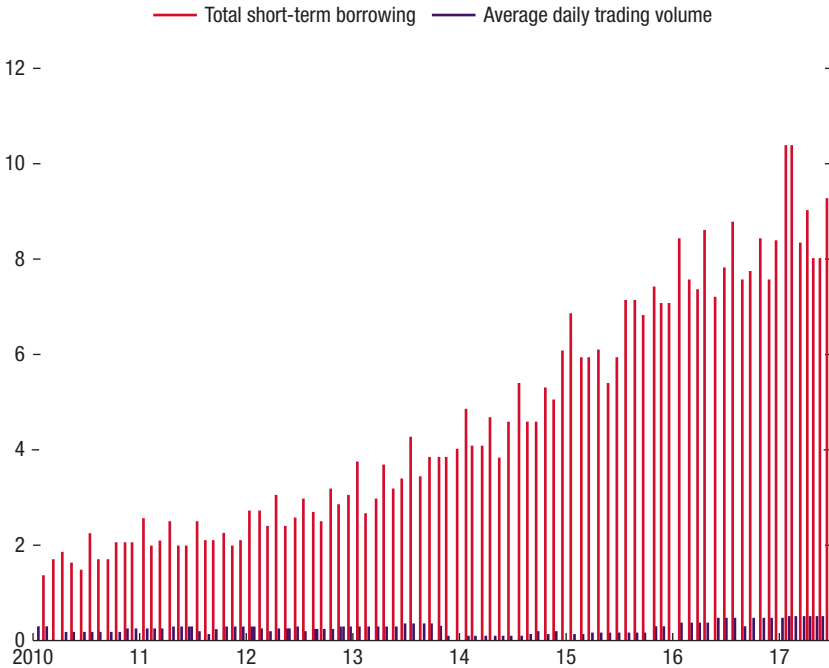
Note: Data shown are the 2017 average and are calculated counting both counterparties to every trade. For China, the data are based on trades registered with the China Central Depository and Clearing Co. For the United States, the data are based on the Federal Reserve's FR2004 primary dealer data series.

FINANCIAL STABILITY IMPLICATIONS

Episodes of deteriorating bond trading volumes and market liquidity may pose financial stability risks. In particular, the tendency for both trading and funding conditions to weaken at the same time implies that, in times of stress, market participants facing funding pressures could experience difficulties accessing liquidity when they need it most. This poses the risk of a procyclical deterioration of both trading and funding liquidity that could lead to defaults.

This link between market and funding liquidity is unique in China's case. Investment vehicles and other market participants tend to rely on interbank borrowing to meet liquidity shortfalls, which is often made possible by implicit guarantees from sponsoring financial groups. This prevents the need to sell bonds as markets become increasingly illiquid, but can result in rising debt and upward pressure on borrowing rates. This creates a negative feedback loop by further

Figure 12.13. Daily Average Trading Turnover and Total Repurchase Market Borrowing, 2010–18
(Trillions of renminbi)



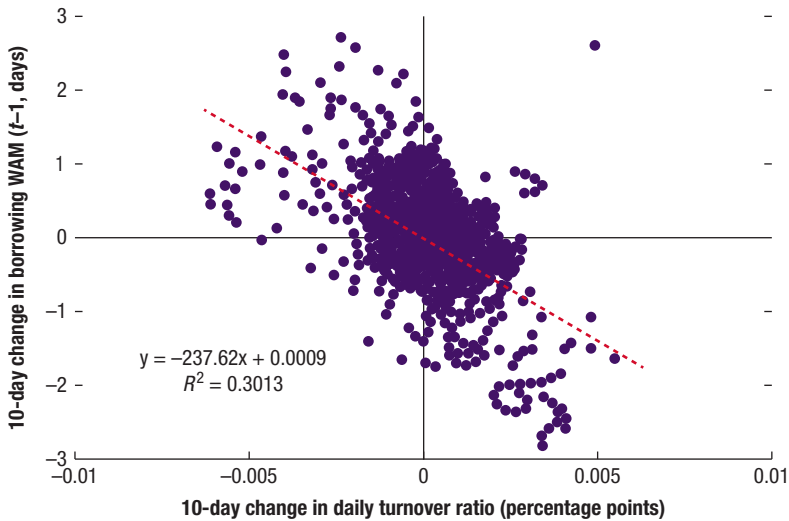
Sources: CEIC; WIND Economic Database (www.wind.com.cn); and authors' calculations.

reducing rate-sensitive trading. This practice is reflected in the large imbalance between short-term borrowing and trading. At around RMB 9 trillion, the stock of short-term borrowing was about 20 times larger than average daily trading volume in 2017 (Figure 12.13). That is nearly triple the peak ratio of 7 times reached in the US repo market in September 2008.

Reduced trading liquidity appears to exacerbate funding market conditions because it is associated with rising demand for longer-dated repo debt (Figure 12.14). When trading declines, the weighted average maturity of daily repo borrowing tends to increase from around two days to three to four days. This may be because borrowers expect it will take longer to sell or source stable funding for their existing positions funded with repos. As a result, the stock of total short-term debt tends to rise as trading declines (Figure 12.15).

The link between trading and funding may also reflect the imbalance between the stock of borrowing and daily trading, which may limit the market's flexibility to absorb further increases in demand for liquidity. This imbalance means the majority of repo borrowing maturing each day must either be rolled over or financed through other instruments like deposits. When trading volumes decline, a larger share of

Figure 12.14. Bond Market Turnover and Repo Borrowing Maturities, December 2014 through July 2018
(Days; percentage points)



Sources: CEIC; WIND Economic Database (www.wind.com.cn); and authors' calculations.
Note: Data are 5-day averages. WAM = weighted average maturity.

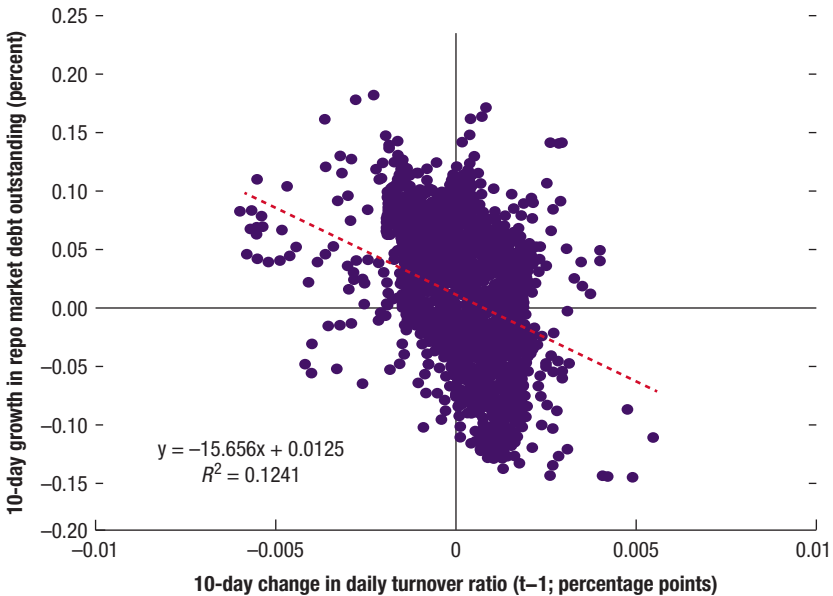
maturing borrowing must be rolled over or repaid with deposits, increasing the strain on available liquidity. As shown in Figure 12.16, money market rates tend to reflect the ratio of repos outstanding to average daily trading values.

The procyclical link between trading and funding presents two interrelated risks. The first is that deteriorating funding conditions could trigger interbank defaults, causing instability as market participants simultaneously attempt to reduce counterparty exposure. The second is that an investment vehicle facing financing pressures attempts to sell largely illiquid corporate bonds into a thinning market. This could create a different but similarly destabilizing feedback loop between declining bond (collateral) values, weakening balance sheets, and interbank funding conditions.¹³

This procyclical link between bond trading and financial conditions represents a significant vulnerability in China's financial markets and highlights the continuing importance of implicit guarantees. In practice, authorities have injected liquidity to stabilize interbank liquidity costs, in part reflecting efforts to transition monetary policy toward an interest-rate-targeting

¹³ This second risk resembles the "liquidity spiral" dynamic identified by Brunnermeier and Pedersen (2007). In that case, fire sales of bonds would lead to large price declines, which weaken funding liquidity by affecting balance sheets (via a "loss spiral") and increasing collateral margins (a "margin spiral"). The first risk would be consistent with continued falls in trading activity and minimal declines in bond prices, which is what occurred initially in the June 2013 interbank liquidity crunch episode.

Figure 12.15. Bond Market Turnover and Repo Debt Growth, December 2014 through July 2018
(Percent; percentage points)



Sources: Bloomberg L.P.; and China Foreign Exchange Trade System.

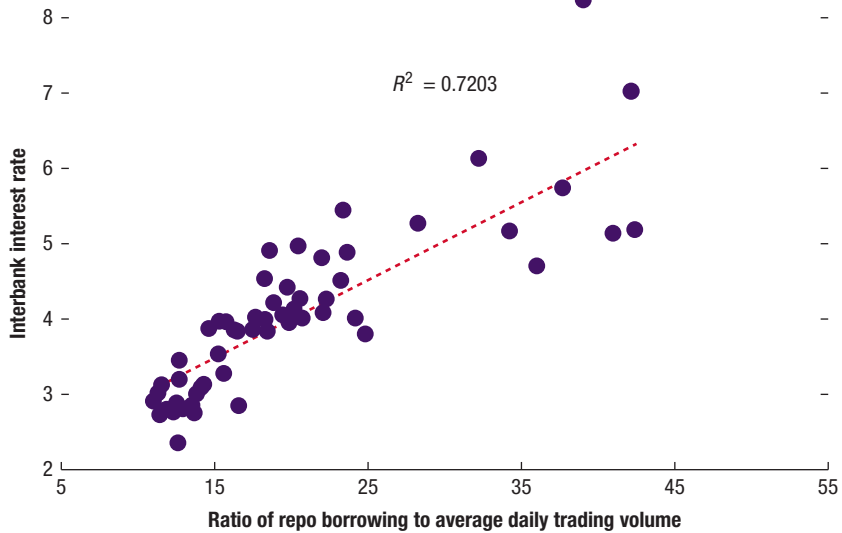
Note: Data are 5-day averages.

framework. This arrangement has prevented instability related to procyclical deteriorations in funding conditions. But it has come at the cost of reinforcing moral hazard and increasing borrowing, exacerbating the original imbalance between debt and trading liquidity.

POLICY RECOMMENDATIONS

To address financial vulnerabilities, including implicit guarantees, and enhance the transmission channel of monetary policy, Chinese policymakers should make improving bond market liquidity a priority. Policy measures should be aimed at increasing the availability of competitively priced market-making services as well as at diversifying the investor base in order to foster demand for such services. Key supply-side priorities include strengthening market making and market structure, including by deepening derivative and securities financing markets. Demand-side efforts should revolve around

Figure 12.16. Interbank Interest Rate and Ratio of Repo Borrowing to Daily Spot Average Trading, June 2013 through June 2018
(Percent; times)



Sources: CEIC; WIND Economic Database (www.wind.com.cn); and authors' calculations.

measures to broaden the set of market price-sensitive investors, including foreign investors.¹⁴

Policies to Strengthen Trading Liquidity Supply: Market Making and Market Structure

The first set of policies to boost the resilience of liquidity should be focused on strengthening hedging tools and market structure to improve the supply of continuous, competitively priced trading liquidity. Robust fixed income derivative and securities financing markets have well known and important benefits for bond market trading liquidity.¹⁵ Securities financing markets, primarily outright repo markets,¹⁶ help facilitate more efficient market making by helping finance bond inventories and source specific bonds more cheaply. Derivatives markets, such as bond futures and interest rate swaps markets, help market makers offset interest rate and credit risk, and help encourage more balanced, two-way market

¹⁴ For further details on IMF and other international financial institutions' recommendations on local currency bond market development, please see IMF (2013). For a summary of international financial institutions' recent technical assistance programs on local currency bond market development, please see IMF (2018b).

¹⁵ See CGFS (1999, 2014) and Fontaine, Garriott, and Gray (2016).

¹⁶ Outright repo refers to a transaction where the exchange of collateral is an outright sale, rather than a pledge, which enables sale or re-lending of the collateral security.

positioning. Conversely, market making in derivatives creates hedging needs in the underlying bond that require more trading in secondary markets. The use of derivatives and securities financing also facilitates arbitrage and spread-trading strategies that improve market price discovery and reduce price irregularities. Greater use of these instruments will, however, increase the need for more sophisticated risk and liquidity management.¹⁷

Key policy priorities in this area would include giving banks access to Chinese government bond futures, encouraging the development of the outright repo market, and reducing market fragmentation.

- *Widen investor access to the Chinese government bond futures market:* The Chinese government bond market would benefit from providing commercial banks—which are the asset's dominant investor and cash market trader—access to the Chinese government bond futures market. Small and medium-sized banks in particular are already highly active in trading (see Figure 12.11), despite classifying most bonds as held-to-maturity, and have growing incentives to manage bond risk because of updated International Financial Reporting Standards. Foreign banks and investors should also be granted access to serve as an incentive for their participation in the market and diversify sources of liquidity provision.
- *Develop the outright repo market:* To facilitate the development of an outright repo and CDS market, authorities need to further strengthen creditor rights and clear up areas of regulatory uncertainty. Key steps include explicitly protecting the right to liquidate collateral in the event of counterparty default and removing remaining legal and regulatory hurdles to the use of close-out netting. These measures are needed to allow financial institutions to use their securities collateral or purchased credit protection (for example, in the CDS market) to offset counterparty credit and liquidity risk exposures, which are critical to making these trades sufficiently economical.¹⁸
- *Centralize market making to boost price discovery:* To improve price discovery and market efficiency, authorities should seek to facilitate more trading between market makers. This could be accomplished by encouraging greater market infrastructure dedicated to an active interdealer market, strengthening market-making obligations at official primary dealers, and reducing impediments to trading across market venues. These measures should be an important component of efforts to unify bond market regulation and reduce the fragmentation of liquidity, issuance, and investor access between different trading venues.
- *Strengthen benchmark rates and the yield curve.* Authorities should also seek to minimize and stabilize the discrepancies across various de facto risk-free yield curves. This effort would entail equalizing investor access and regula-

¹⁷ These activities may increase financial market complexity but overall risks are manageable within the postcrisis capital and liquidity regulatory framework.

¹⁸ The recently announced tri-party repo scheme may be helpful for development of an outright repo market if it increases securities borrowers' reuse of collateral.

tory incentives for participation in all bond types and venues, for instance, by harmonizing the tax rates that commercial banks pay on Chinese government bond and policy bank bond coupon income, which currently favor their holdings of Chinese government bonds. A more unified and deeply traded risk-free yield curve will also help strengthen authorities' influence over borrowing and saving decisions in the real economy, boosting monetary policy transmission.

Other important liquidity supply-side policy priorities should include further development of the interest rate swap and CDS markets.

- *Strengthen the interest rate swap market:* Authorities should encourage market participants to concentrate trading in a handful of key benchmark tenors along the Chinese government bond yield curve and in a small set of floating-rate products that are acceptable to banks and corporations for use in pricing loans and other financial products (eliminating superfluous swaps linked to the loan prime rate, benchmark policy lending, deposit rates, and so on). Further progress in transitioning toward an interest-rate-targeting monetary policy framework will also be important to minimize volatility in the floating rate leg of the swap.
- *Develop a CDS market:* Bring CDS closer into alignment with international practice by reducing remaining regulatory uncertainty about documentation and creditor rights, so that purchased credit protection can factor into risk management (see above). Developing a deeper CDS market will improve the management of credit risk in repo and support credit bond market making.

Policies to Strengthen Demand for Liquidity

Policy priorities to strengthen investor demand for trading liquidity should focus on diversifying the investor base and increasing incentives to mark securities to market, where appropriate. Key measures include encouraging greater participation by foreign and long-term investors, such as insurers and pension funds, and amending asset management rules to more strictly limit exceptions to the use of net asset value accounting for investment products.¹⁹

- *Increase foreign investor and foreign broker-dealer activity:* Several technical hurdles continue to impede foreign participation in China's bond market, as detailed in Chapter 11 on clearing roadblocks to foreign participation. Foreign investors will add diversity to the investment strategies and time horizons of the investor base, and will increase demand for hedging products. Foreign broker-dealers will bring greater sophistication to market

¹⁹ Net asset value accounting is a method for determining the value of an investment fund attributable to equity holders (that is, holders of fund shares). It is calculated by the total value of the fund's asset portfolio less its accrued liabilities.

making and trading that can help improve the competitiveness of market-making services.²⁰

- *Increase the diversity of local market buy-side participants:* Pension funds, insurance companies, mutual funds, hedge funds, and other investors similarly add to the diversity of investment strategies and risk mandates operating in the market, which may lessen the risks of one-way positioning in the market during periods of speculation-driven flows. One way to support greater bond market participation by these entities is to make investment products less appealing by reducing their perceived implicit guarantees and other advantages over directly holding bonds. Currently, these products offer institutional investors more favorable yields, less credit risk, and less accounting volatility than a typical bond portfolio (see below).
- *Require greater use of mark-to-market accounting for investment products:* The new regulatory regime for asset management products should gradually eliminate use of amortized cost valuation for asset management products, such as wealth management products and money market funds, except in very limited circumstances. This is important in increasing competition among fund managers to actively manage bond portfolios and maximize returns given risk, which should increase secondary-market trading. The lack of accurate, transparent valuations is an important factor allowing investment products to offer low-risk, high-yielding products with shorter maturities, which crowds out demand for direct exposure to the bond market.
- *Further increase the price orientation of the financial system:* Phasing out the use of growth targets for banks and local governments and increasing the price orientation of monetary policy will stabilize short-term market interest rates. This will help avoid fluctuations in trading activity caused by uncertainty around valuations and term premiums. Removing commercial banks' de facto restrictions on deposit pricing will also help them price their bids for government bond holdings more competitively.

CONCLUSIONS

Trading in China's bond market tends to fluctuate in sync with market repo rates and bond market cycles. This likely reflects several institutional and structural features of the Chinese bond market, including the prevalence of carry-trade-type activity among the investor base, comparatively low hedging activity, and challenges around price discovery and valuation.

These fluctuations in liquidity could pose financial stability risks because they tend to lead to simultaneous deterioration in funding market conditions. Moreover, they require authorities and market participants to inject liquidity to

²⁰ Given low foreign participation and the large absolute size of China's bond market, at this time the marginal benefits to market deepening would likely outweigh any (small) risk of increased volatility or external spillovers.

avert a pernicious deleveraging cycle, which undermines market discipline. Improving bond market liquidity should thus be an important part of broader efforts to reduce financial vulnerabilities in China.

Reducing barriers to widespread use of derivatives and rehypothecation may bring increased risks and complexity, as demonstrated by their misuse in bond markets in developed countries in the lead-up to the global financial crisis. Yet these risks can be managed by regulation, as they were in many countries during the crisis, and as they are now in countries where such risks played a key role in the crash.

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Tapering Implicit Guarantees in the Bond Market

ZHU Ning, DING Ding, and ZHANG Chi

Developing a modern and multilayered capital market has been a top priority for the Chinese government. But even as China's A-shares market has listed more than 3,000 stocks and commanded some of the largest initial public offering transactions in the world in recent years, its bond market still seems underdeveloped, reflecting segmented markets and regulation, the lack of developed rating agencies, and limited institutional investors (see Chapter 1).

Yet, what really sets China apart from other countries is the prevalent perception of implicit guarantees in China's financial system. Unlike in most other bond markets, where creditors and debtors expect certain risks of potential defaults and bankruptcies, investors in China's bond market tend to believe that the liabilities of certain companies can be taken care of by the parent companies or government agencies when needed. The Chinese government commands such large resources through its land reserves and equities in state-owned enterprises (SOEs) that investors believe that there is no debt that the government cannot repay, if it sets its mind to it.

In addition to the common stigma toward defaults and bankruptcy, people in China are averse to such events not least because the trust in the economy is largely built upon personal relationships, whereas law and enforcement is often vague and ineffective in disciplining debtors' behavior. In addition, the government is concerned that defaults and bankruptcy may trigger social unrest, especially if they affect many retail investors. Exits of SOEs are rare, owing to the conflict of interest for the government as both the shareholder and the regulator.

To understand why China's bond market needs fundamental changes to achieve the government's goal of a modern and multilayered capital market, one must first properly understand the origin and the implications of implicit guarantees. This chapter begins with a look at two illustrative cases of corporate default, presents the market implications of implicit guarantees, and then recommends a course of action.

The authors thank Itai Agur and Alfred Schipke for helpful comments.

CASE STUDIES OF CORPORATE DEFAULT

The following two case studies highlight the widely held view in China that certain companies are ultimately sheltered from default risks. While they are individual cases, and hence must be taken with a grain of salt, they nevertheless provide insights, especially into how the government manages credit risks.

Default of the China Credit Trust Company

In January 2014, a trust product sold by the China Credit Trust Company was under pressure to repay its investors. The product, backed by assets from a once successful mining business, Shanxi Zhenfu Energy Group, not only lacked the cash flow to repay its investment dividends, but also the assets to cover the product's principal, both due on January 31, 2014.

Shanxi Zhenfu originally took out a renminbi (RMB) 3 billion (about US\$500 million) loan from the China Credit Trust Company and the Industrial and Commercial Bank of China (ICBC) to expand its production capacity. However, a fall in global commodity prices and the lackluster global economy at the time eventually led to financial distress at the company.

When Shanxi Zhenfu's problems were reported, China Credit Trust claimed that it only played a role as a "distribution channel." Indeed, the real holder and guarantor of the product was the Shanxi branch of ICBC, China's largest, as well as the world's largest, bank by assets and revenue. Yet, ICBC announced that it did not and would not take responsibility for repaying the principal or interest on the products.

Even though there was no public announcement on how the default was eventually resolved, it was widely believed that China Credit Trust, ICBC, and the Shanxi provincial government worked together to provide financing so that all investors in the trust products received their full principal back.

Default of Chaori Debt

Following the near-default of the China Credit Trust Company's trust product in January 2014, the default of the Shanghai Chaori Solar Technology (Chaori) bond in March 2014 became the first default in China's onshore bond market. The solar energy company saw revenues drop 66.3 percent in fiscal year 2013. It was already on the verge of defaulting in March before being bailed out at the last minute by China Securities Depository and Clearing Corporation Limited, a central counterparty clearing house for the country's capital market.

The resolution of the Chaori default included different repayment plans for individual versus institutional investors. Even though for the latter, resolution remains to be determined by court decisions years after the default, individual bond investors were assured early on that they would receive their full principal back.

IMPLICIT GUARANTEES IN THE CORPORATE BOND MARKET

The preceding two case studies showcase why investors in China have reason to believe that their investments in corporate bonds and even shadow banking products have little risk of default. This is particularly the case for SOE products, given SOEs' unique role in the Chinese economy. On the one hand, SOEs take care of governmental responsibilities such as providing infrastructure, social welfare, education, and—especially in the past—even borrowing on behalf of local governments (through local government financing vehicles, or LGFVs). On the other hand, SOEs enjoy many benefits from their close government ties, especially in access to financing such as bank loans.

Encouraged by the government to become ever “bigger and stronger,” SOEs have seen their assets and liabilities rise steadily over the last decades, with liabilities in the form not only of bank loans, but also capital market products. Total SOE assets as a share of GDP increased by more than 50 percentage points from 2006 to over 200 percent of GDP by 2016. For highly leveraged SOEs, government guarantees prove most valuable when they face refinancing difficulties. Sometimes the government makes “implicit guarantees” explicit by using its fiscal income to guarantee the security of the loans made to these companies. The government can also provide companies with much-needed government orders, which can boost companies' short-term financial performance, or allow companies to forgo local government taxes.

With such government guarantees, investors often choose to disregard SOE credit risks. These soft-budget constraints on SOEs led to the substantial buildup of SOE debt in the economy and fostered widespread moral hazard and excessive risk taking by investors, corporations, local governments, and financial institutions. Such perceptions also create an uneven playing field that distorts the allocation of financing toward SOEs, crowds out the private sector, and lowers productivity growth.

A special type of SOE bond, so-called *chengtou* bonds, are issued by LGFVs, often in the construction sector. Chengtou bonds were first introduced in 1992, but they remained a trivial part of the onshore bond market until 2009. With the RMB 4 trillion economic stimulus package introduced in 2009, the outstanding balance of chengtou bonds increased rapidly as local governments relied heavily on LGFVs to finance their large investment projects, given the constraints on direct local government borrowing. Many market participants regarded chengtou bonds as guaranteed by local governments, even though the bonds were liabilities of local enterprises rather than local governments.

The adoption of a new Budget Law in late 2014 was seen as an important milestone in fiscal management in China. It created a much-needed framework for local government borrowing, with a key goal being to bring all spending that is fiscal in nature into the budget and finance it transparently, while clarifying that

other, commercial investment projects of local governments, such as chengtou bonds, do not have an explicit or implicit government guarantee.¹

Following the introduction of the new Budget Law, China's State Council in 2015 launched the local government debt swap program, aiming to transform local governments' nonbond debt into local government bonds. A nationwide "screening, identifying, and clearing-up" campaign was conducted. Outstanding chengtou bonds, together with other local government debts that were confirmed during the screening process, were recognized as government liabilities. With investors' consent, these bonds could be swapped into government bonds.² Should agreement not be reached, enterprises issuing chengtou bonds would still be recognized as the debt bearer, and local governments would bear only limited responsibility up to what they initially invested in LGFVs. From 2015 to the end of 2017, about RMB 10 trillion in local government debt was swapped. However, the yields on chengtou bonds did not change materially after the launch of the swap program, an indication that market participants have not internalized the removal of government guarantees in the pricing of chengtou bonds.

Notably, implicit government guarantees also apply to some private companies, especially those deemed "too big to fail" for the local economy and labor markets. As a result, the pricing of a private company's bonds sometimes also reflects to what extent investors believe the company's related government agencies would be willing to bail the company out in the event of distress (as was the case for Chaori before the company eventually defaulted on its bond repayment). Such belief from investors can create adverse incentives that motivate private companies to take out more debt for expansion.

Implicit Guarantees for Local Government Debt

Another distinctive feature of China's bond market and financial system is that not only are SOEs firmly believed to be immune from credit risks, but government agencies behind the SOEs enjoy even greater confidence from investors.

After a long period of suspension starting in 1993, China's local government bond market reopened in 2009. The stock of local government debt rose by 20 percentage points of GDP from 2013 to 2017, to a level exceeding the outstanding stock of sovereign debt in 2017 (see Chapter 5 on the local government bond market). The buildup of fiscal risks in local government finance has prompted the central government to tighten the local government borrowing framework. The 2014 Budget Law adopted the strategy of "opening the front door and closing the back door" in which it tightened local government off-budget borrowing and other unregulated sources, while allowing provincial

¹ On August 13, 2018, Xinjiang Liushi State Capital Operating Co., a local SOE in the Xinjiang province, defaulted on its short-term notes. Although full payment was delivered three days later, many market participants regarded it as the first technical default on publicly placed chengtou bonds.

² Local governments could issue government bonds to repay the chengtou bonds early. Specific terms of repayment were negotiated between local governments and chengtou bond investors.

governments to issue their own bonds, subject to an annual cap determined by the National People's Congress.

According to the Budget Law, the central government does not guarantee local government debt. In practice, however, the perception of central government guarantees on local government debt is widely shared among market participants, not least because of the relatively sound balance sheet of the central government.

As noted by the 2018 debt sustainability analysis conducted by the International Monetary Fund (IMF), China's official budgetary government debt remains low and sustainable (IMF 2018). Under the narrow definition, which includes central government debt and "on-budget" local government debt identified by the authorities, total government debt registered at 37 percent of GDP at the end of 2017 and is projected to rise to 43 percent of GDP by 2023.

However, as the IMF pointed out, the "augmented" concept of government debt highlights much bigger risks to long-term fiscal sustainability. The concept adds to official government debt other types of local government borrowing, including off-budget liabilities borrowed by LGFVs via bank loans, bonds, trust loans, and other funding sources, as well as debt of government-guided funds and special construction funds, whose activities are considered quasi-fiscal. IMF staff estimate that China's augmented debt will rise from 68 percent of GDP in 2017 to about 92 percent of GDP by 2023, a high ratio by international standards.

To the extent that official government debt remains under control and a strong intergovernmental transfer system for revenue sharing is in place, the risk of any local governments defaulting on its bond repayment is negligible. The perception of implicit guarantees is further reinforced by the fact that local governments control land supply with land sales, contributing one-third of local government revenue, and China's property market has been on a multiyear and largely uninterrupted upward trend ever since the commercialization of the residential housing market in the 1990s.

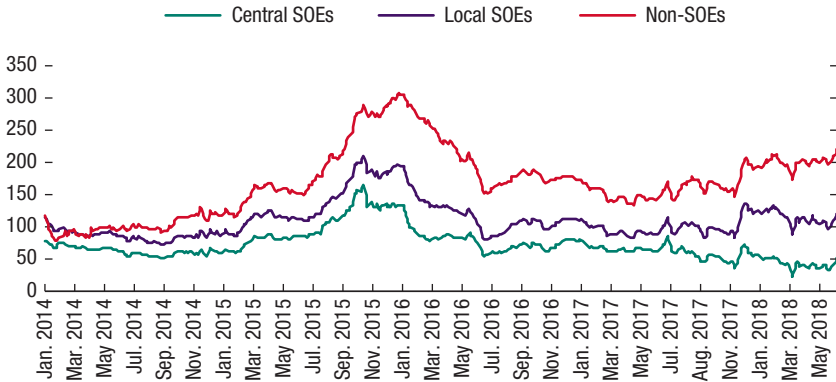
MARKET IMPLICATIONS OF IMPLICIT GUARANTEES

Bond Market Pricing

Risk pricing in China's bond market shows clear signs of implicit guarantees for SOEs. Investors regard SOEs regulated by the central government (central SOEs) as the safest, and their bonds in general have the lowest yields among all credit bonds. SOEs regulated by local governments tend to have lower yields compared to non-SOEs (Figure 13.1).³

³ The credit spreads are Xingye Credit Spreads computed by Xingye Securities, a Chinese investment bank. The computing sample covers short-term notes, medium-term notes, enterprise bonds, and publicly placed corporate bonds. Bonds maturing in six months; bonds with floating interest rates; and bonds with special terms, options, or special credit enhancement measures are excluded. For each bond, the credit spread is computed against the China Development Bank bond yield of the same maturity. The weighted average is then tabulated according to bonds' outstanding balance.

Figure 13.1. Credit Spreads of SOEs and Non-SOEs, January 2014 through May 2018
(Basis points)



Source: WIND Economic Database (www.wind.com.cn).

Note: Bonds in each company type are aggregated through weighted balance of outstanding balance.

Central SOEs = state-owned enterprises regulated by the central government; local SOEs = state-owned enterprises regulated by the local government; SOEs = state-owned enterprises.

The recent pickup in bond yields, more pronounced for non-SOE bonds than for those issued by SOEs, was related to the regulatory tightening measures that the government has implemented since 2016. The spread between central SOE bonds and non-SOE bonds was largely stable until November 2017 but rose rapidly following the release of the draft regulation on the asset management business in late 2017 and widened again when the draft regulation was approved in 2018 (Figure 13.2). To the extent that the average profitability or efficiency of central SOEs is lower than that of private companies, the widening spread can be largely explained by risk differentiation based on investors' perception of implicit guarantees.⁴

Bond Market Defaults

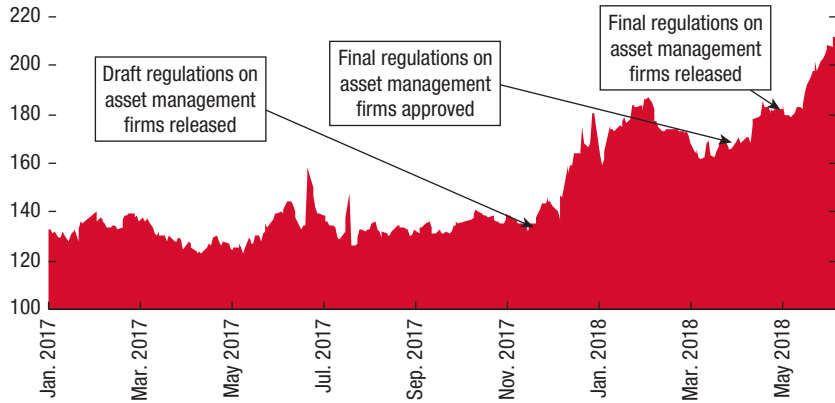
Since the first bond market default in 2014, the total amount of defaulted bonds has increased from RMB 1.3 billion in 2014 to RMB 29 billion in 2016, represented by the red bars in Figure 13.3. In 2017, 38 bonds defaulted, with the total reaching RMB 32.5 billion. Although the total defaulted amount kept increasing, the number of bonds defaulted (purple line) and the number of new defaulted issuers⁵ (green line) dropped substantially in 2017. Based on the data in the first

⁴ As shown in IMF (2018), the average SOE return on assets (ROA) ratio has been structurally below that of private firms. In 2017, the average ROA ratio for SOEs was about 2 percent, compared to 10 percent for private firms.

⁵ If a bond issuer has multiple bonds outstanding and one of them defaulted, its other bonds would also be likely to default. Considering the situation, if an issuer's bonds defaulted in both 2014 and 2015, it is counted only in 2014 when calculating the green line.

Figure 13.2. Difference between the Credit Spread of Non-SOEs and Central SOEs, 2017–18

(Basis points)

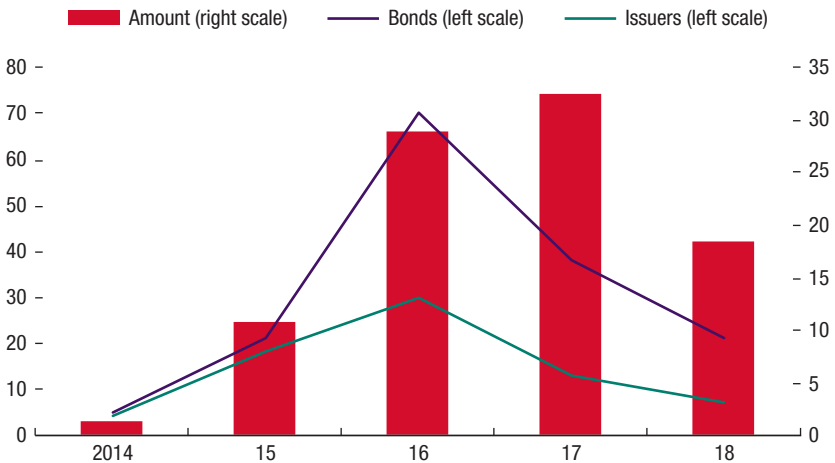


Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Note: Bonds in each company type are aggregated through a weighted balance of the outstanding balance.

Figure 13.3. Number and Amount of Defaulting Bonds and Number of New Defaulting Issuers, 2014 through June 2018

(Number; billions of renminbi)



Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

half year, the scale of bond market defaults in 2018 is similar to that in 2017. Nonetheless, the total bond market default rate remains low at about 0.5 percent, compared to 1–2 percent in bond markets of other major economies.

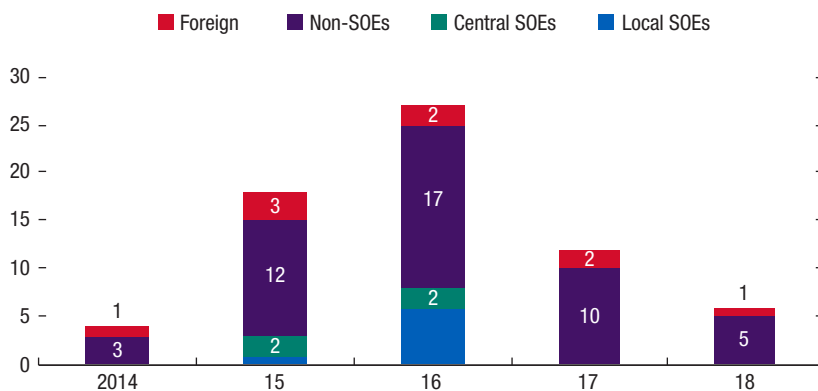
Categorized by ownership, most bond defaults are of non-SOEs (Figure 13.4). The first SOE defaults occurred in 2015, and the number of newly defaulted SOEs more than doubled in 2016, before dropping to zero in 2017. Altogether there have been four central SOE defaults and seven local SOE defaults. Meanwhile, the number of newly defaulted non-SOEs has increased rapidly since 2014.

By industry, the manufacturing sector accounts for most defaults (35 in the data sample). Industries with overcapacity, such as coal and steel, also registered 9 defaults. Defaults in 2016 were more concentrated in the industrial sectors, while in 2017 and the first half of 2018 defaults were scattered across industries more evenly (Figure 13.5).

From 2014 to June 2018, 80 of the 155 defaulted bonds had medium-term maturities (1–3 years). In 2016, the number of defaults on short-term bonds maturing within one year increased rapidly compared to previous years, while in 2017 it dropped substantially. Defaults of long-term bonds (maturity longer than 3 years) increased in 2017 and may continue to grow based on the data in the first half of 2018 (Figure 13.6).

Among the default cases with rating information available, half received an AA rating when the bonds were issued, followed by those with an AA– rating. The first default for a bond with an AAA rating took place in 2018 (Figure 13.7). Among the 155 defaulted bonds, 11 registered eventual repayment of principal,

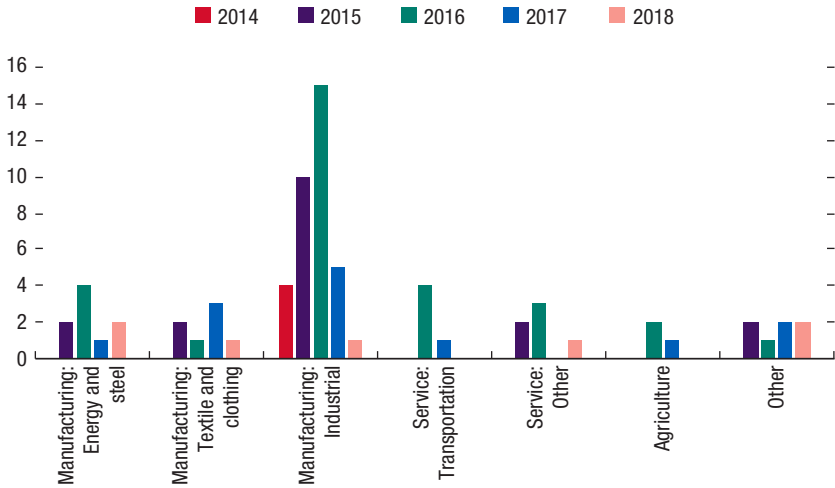
Figure 13.4. Number of New Defaulting Issuers, by Ownership Type, 2014 through June 2018



Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Note: Central SOEs = state-owned enterprises regulated by the central government; foreign = joint ventures, firms wholly owned by foreign investors, and firms with foreign participating SOE stockholders; local SOE = state-owned enterprises regulated by the local government; SOEs = state-owned enterprises.

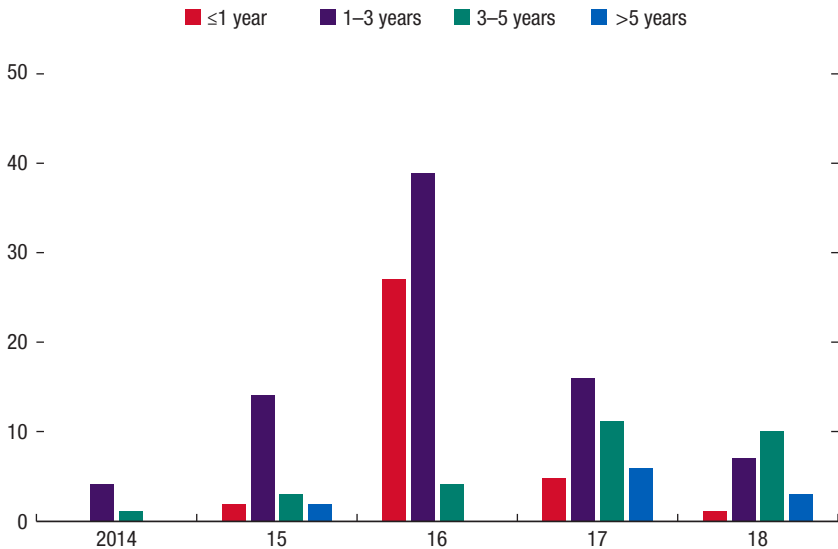
Figure 13.5. Number of New Defaulting Issuers, by Industry, 2015 through June 2018



Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Note: Categories are merged based on WIND industry categories.

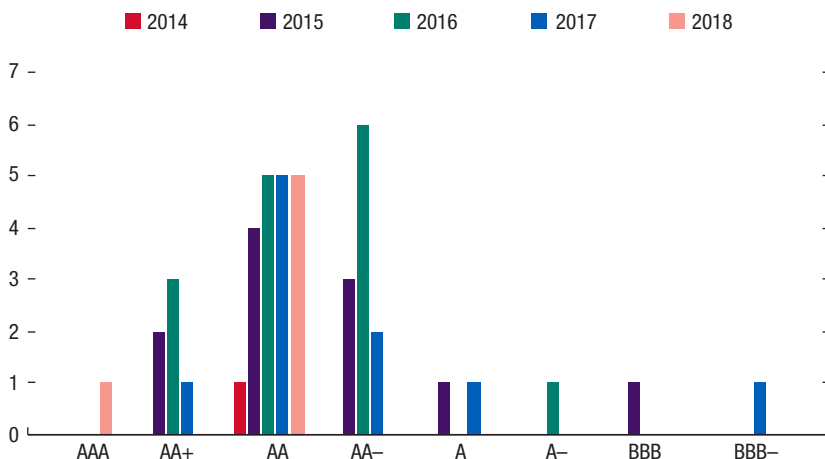
Figure 13.6. Number of Bonds Defaulted, by Tenor, 2014 through June 2018



Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Note: Observations without rating information are dropped.

Figure 13.7. Number of New Defaulting Issuers, by Credit Rating upon Issuance, 2014 through June 2018



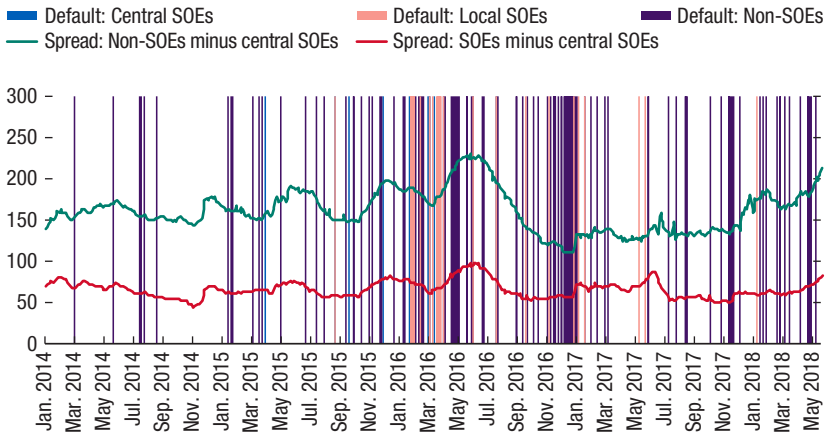
Sources: WIND Economic Database (www.wind.com.cn); and authors' calculations.

of which 7 registered full repayment. The length between default and full repayment varied from several days to four months.

There are interesting variations between SOEs and non-SOEs in the resolution of bond defaults. Upon default, government agencies or the controlling shareholders often tried to help the defaulted SOEs repay their debts, while non-SOEs have not had the same support from government. For example, after the first default of Sichuan Coal Industry Group in 2016, RMB 1 billion entrusted loans were provided to repay creditors. It was reported that the entrusted loan was coordinated by the relevant government agencies (LI and HE 2016). Another example is the 2015 bond defaults by China National Erzhong Group, a company that makes machine tools. Its debt was subsequently fully undertaken by its controlling shareholder, SinoMach, a central SOE.

In addition to funding support, local governments also influence SOE debt restructuring by playing the leading role in creditor committees. Among the 11 SOE default cases since 2015, 2 resulted in controlling shareholders taking over the debt, 2 resulted in debt repayment by the SOEs themselves, and another 2 resulted in debt-to-equity swaps. Altogether, in 7 out of these 11 cases, local governments actively participated in the default settlement. In this regard, the rising number of SOE defaults does not indicate any material dissipation of implicit guarantees. As a matter of fact, if an SOE was able to leverage its government ties in the process of debt restructuring and liquidating defaulted debt, its bonds sometimes became more attractive to investors after the default.

Figure 13.8. Default Events and Credit Spread Differences between Different Types of Enterprises, January 2, 2014, through May 2, 2018
(Basis points)



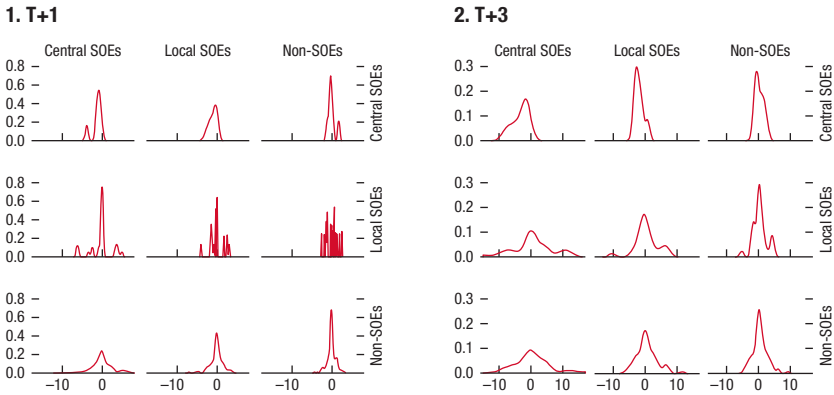
Source: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Note: The figure uses the Xingye Credit Spread computed by Xingye Security, a Chinese investment bank, of SOEs and non-SOEs (in basis points). Central SOEs = state-owned enterprises regulated by the central government; local SOEs = state-owned enterprises regulated by the local government; SOEs = state-owned enterprises.

Bond Market Defaults and the Impact on Spreads

Normally, bond market defaults are an important indication of serious financial stress that would lead to an increase in the risk premium of the relevant companies and sometimes even the relevant sectors. In China, however, the correlation between defaults and the change of risk premium is less obvious (Figure 13.8). There were periods where default events were associated with decreasing credit spreads, such as the second half of 2016 and early 2018. Nonetheless, non-SOE spreads usually rise more than local SOEs', indicating a larger beta for the former.

To better understand the relationship between spread changes and bond market defaults, we calculate the change of central SOE, local SOE, and non-SOE spreads following default events and estimate the distributions of spread changes (Figure 13.9). Most distributions, especially those after a non-SOE default (row 3 in each panel), are concentrated around zero, indicating that the empirical probability of a spread increase following a default event is of the same scale of that of a spread decrease. On the other hand, following a central SOE default (row 1 in each panel), the changes in spreads of central SOEs are more concentrated below zero compared to those of non-SOE spreads (columns 1 and 2 versus column 3). That is, non-SOEs tend to face tighter investor risk aversion than central SOEs even after a central SOE default.

Figure 13.9. Change of Credit Spread after a Default Shock: Density Estimation

Source: WIND Economic Database (www.wind.com.cn); and authors' calculations.

Note: The figure uses the Xingye Credit Spread computed by Xingye Securities, a Chinese investment bank, between SOEs and non-SOEs (in basis points). T = the date of default documented in the WIND Economic Database (when official announcements of default are released); $T+1$ refers to one day after the default date. Central SOEs = state-owned enterprises regulated by the central government; local SOEs = state-owned enterprises regulated by the local government; SOEs = state-owned enterprises. Rows 1 through 3 indicate defaults of central SOEs, local SOEs, and non-SOEs, whereas columns 1 through 3 indicate spread change of central SOEs, local SOEs, and non-SOEs. For example, the figure in row 2, column 1 demonstrates the distribution of changes in spreads of central SOEs (in percentage points) facing local SOE default shocks.

The preceding analysis confirms that defaults in China's bond market are by and large not reflected in the pricing of credit risks. However, the analysis has three caveats. First, the dates of default documented in the WIND Economic Database are when official announcements of default are released. It is possible that market participants would get news or signs of default through unofficial channels beforehand. Second, due to the limited number of SOE defaults, the distribution estimation (in rows 1 and 2 of Figure 13.9) may be inaccurate. Third, as discussed in previous chapters, many corporate bonds in China have low turnover rates. Therefore, the quotes may not reflect all available information and risks.

HOW CAN IMPLICIT GUARANTEES BE UNWOUND?

Implicit guarantees are prevalent throughout China's financial system, leading to mispricing of risk and misallocation of resources. Unwinding this web will inevitably introduce greater uncertainty into the financial system and cannot be done overnight. At the same time, the process must start and will involve greater acceptance of defaults, credit events, and bankruptcies. This applies to SOEs in particular, which benefit from preferential access to financing supported by perceived state backing of their liabilities.

Tighten the Macrofinancial Settings

A root cause of the entrenched perception of implicit guarantees in China is the government's pursuit of unsustainably high growth targets, leading to continuous rapid expansion of credit to achieve the growth targets (with diminishing credit efficiency) and the need to evergreen loans to hide losses. In this regard, concerted efforts are needed to shift growth from the unsustainable credit-driven model to a more sustainable path.

Critically this involves deemphasizing the quantitative annual growth targets and tightening the macroeconomic policy stance. As noted in the 2017 Financial System Stability Assessment (IMF 2017), which offered a comprehensive and in-depth assessment of the country's financial system, China's macroeconomic policies aimed at supporting employment and growth have been expansionary, creating strong pressures to keep nonviable firms open—rather than allowing them to fail, particularly at the local government level where these objectives often conflict with financial stability.

Recognizing the accumulation of vulnerabilities in the financial system, the Chinese government embarked upon a financial sector de-risking campaign. Progress has been impressive (IMF 2018). Key elements of the de-risking efforts include tightening loan classification, enforcing the “look-through” principle (whereby the quality of the underlying assets is considered), and enhancing market discipline for financial institutions, which would help tackle the perception of implicit guarantees. These regulatory reforms should continue. Even though they might have short-term negative impacts on credit and GDP growth, a failure to address the underlying vulnerabilities will eventually lead to a sharp adjustment in the long run.

SOE reforms should also be accelerated. Hardening SOE budget constraints would help reduce the incentives for financial innovation, including in the capital market, to finance SOEs despite their lack of economic viability. This can be achieved by phasing out implicit subsidies on factor inputs, forcing nonviable firms and financial institutions to default and exit if market forces warrant (with fiscal support for the affected workers), and addressing the gap between local government revenue and expenditures to reduce local governments' reliance on local SOEs for economic and social spending.

Rule of Law and Respect for Market Discipline

An effective corporate insolvency framework is a well-recognized part of a policy toolkit for addressing corporate overindebtedness and for dealing with the resolution of nonperforming loans, thus serving as an exit channel for investors. Such a framework promotes timely restructuring of viable companies while ensuring effective and speedy exit of nonviable (zombie) firms.

China has made progress in developing its legal and institutional insolvency frameworks. An important step forward was the adoption in 2006 of a modern corporate insolvency law. While the 2006 Enterprise Bankruptcy Law does not

seem to deviate significantly from best international practice, it is a very concise law that does not provide responses for many complex problems in insolvency practice, which would become apparent as practice develops.

More recently, the government took further steps to promote corporate deleveraging through a market-based approach, which, among other things, promotes the use of creditors' committees and debt-to-equity swaps to restructure corporate debt. The authorities are also taking steps to develop the institutional framework necessary to implement the corporate insolvency framework effectively, including enhancing the capacity of the judiciary to handle insolvency cases. Although there were very few insolvency cases until 2016, the trend has reversed and the number of insolvency cases has been increasing significantly.

Despite progress, more needs to be done. Building institutional capacity is a process, and the government should continue efforts to ensure effective implementation of the corporate insolvency framework. As Daniel, Garrido, and Moretti (2016) note, the framework should also entail restructuring the distressed firms based on market discipline, focusing on the following, in particular:

- *Value maximization for creditors:* The framework should include this basic principle for creditors: in a market-based approach, creditors assess the viability of enterprises with the assistance of experts and decide whether a debt-to-equity conversion or any other tool represents the best approach to the restructuring of a viable enterprise. This approach, implemented for each individual enterprise, identifies the nonviable enterprises to be liquidated and allows the flexibility to use the most appropriate techniques to restructure the viable enterprises, including debt-to-equity conversions.
- *Allocation of losses:* Debt restructuring usually entails recognition that the underlying loan has suffered a loss in value and creditors and investors will need to accept losses to render the debtor firm viable. A key area to discuss is the allocation of losses among participants and how these will be covered: First, assuming that the equity stake may have to be sold at a significant discount to attract investors, significant losses will need to be imposed on banks at the transfer stage. Second, if the underlying restructured firms do not perform as hoped given the transfer prices, the implementing institution and/or the investors will suffer losses.
- *Restructuring strategy:* A market-based approach would entail the decision being made based solely on the viability of the firm, not its ties to the government. For healthier firms, a debt rescheduling may be enough to turn the firm around. Weak firms may well be politically well connected and be able to resist a market-based restructuring. These political issues will need to be solved if the implementing institutions and other creditors are to exert their rights to restructure weak firms on a market basis.

An important feature of the recently announced guideline for the asset management business is for financial institutions to break the practice of providing investors with implicit guarantees against investment losses. This may shift

risk-averse investments into safer instruments and reduce the demand for illiquid corporate bonds and nonstandard credit assets.

To strengthen market discipline, regulators need to increase their tolerance for default events. Only through market-based defaults and resolution would investors start to properly price credit risks without the influence of implicit guarantees and the government establish a reputation for allowing market forces to work.

Developing a special resolution regime for banks and systemically important insurance companies is also important. The bankruptcy law applies to financial institutions, but in practice has been rarely used. The current approach is designed to turn a weak financial institution into a stronger one, with local governments leading negotiations on the restructuring of a weak financial institution with its shareholders, creditors, and potential new investors, sometimes with the help of public sector resources. By contrast, international good practice points to imposing losses on shareholders and unprotected creditors, facilitating the orderly exit of nonviable firms, relying on deposit insurance to protect depositors up to the insured limits, and minimizing the use of public funds.

Careful Sequencing of Reforms

Careful sequencing of reforms is needed to safely dismantle implicit guarantees (IMF 2017). Because any radical change to the perception that guarantees are in place could lead to disruptive withdrawals—such as by retail investors from investment products or by short-term bond repurchase (repo) lenders—and could quickly undermine the solvency of some financial institutions and corporations, implementing reforms in a gradual manner before lifting implicit guarantees could mitigate risks.

The reforms should include strengthening market discipline and further progress in developing legal and institutional insolvency frameworks that can promote timely restructuring of viable companies, while ensuring effective and speedy exit of nonviable (zombie) firms. A more detailed prescription can be found in IMF (2017).

Other reforms include improving data quality, increasing capital, tightening regulations for asset quality and group supervision, reducing reliance on short-term funding, and increasing investor awareness of risks. These steps should go hand in hand with strengthening the social safety net so that, as incentives to keep nonviable firms open are eliminated, hardships on the population are minimized. To mitigate the risk of market disruptions, a “grandfather” clause could be introduced to stabilize market sentiment for the current stock of products, whereas all newly issued products should have to carry completely market-determined interest rates and debtors should have to take full responsibility for potential losses.

On the other hand, if removing implicit guarantees takes too long, market participants may have good reason to doubt the government’s determination. In this regard, reforms need to be orderly and decisive. This means staying the course

of financial regulatory reforms even though more proper risk pricing would inevitably increase the funding cost of weaker borrowers in the financial market.

CONCLUSIONS

The perception of implicit guarantees is deeply entrenched in China's financial system, fostering widespread moral hazard and excessive risk taking on the part of investors, corporations, local governments, and financial institutions.

In the corporate bond market, the existence of implicit guarantees is reflected by the trivial bond default rate, generous credit ratings, and compressed risk premiums. Even though the central government has repeatedly stated its ban on local government guarantees of corporate debt, SOEs and LGFVs are still largely shielded from default risks. The dependence of local governments on central government fiscal support to achieve annual growth targets further highlights the challenges in dismantling implicit guarantees.

Despite the recent increase in the number of defaults in the corporate bond market, the total default rate in the corporate bond market remains low and the correlation between bond spreads and default events is still weak, that is, the rising number of defaults in the bond market has not led to greater risk differentiation. Careful sequencing of reforms is needed to safely dismantle implicit guarantees, including further progress in strengthening market discipline and developing legal and institutional insolvency frameworks that can promote timely restructuring of viable companies and speedy exit of nonviable (zombie) firms.

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Monetary Policy Communication: Frameworks and Market Impact

Michael McMahon, Alfred Schipke, and LI Xiang

Bond markets are an important conduit of monetary policy signals to the economy. Reforms that improve the functioning of bond markets will hence facilitate macroeconomic management effectiveness. Here communication plays an increasingly important role. Good monetary policy communication is not only important to improve the effectiveness of monetary policy in the first place, but by reducing uncertainty it makes bond markets more attractive for investors, further improving monetary transmission.

Central banks increasingly use communication as a key lever of monetary policy. Gone are the days of “never explain, never excuse,” as put by the Governor of the Bank of England, Montagu Norman (1920–44).¹ Today, central banks, especially in countries with developed financial systems, communicate regularly. This includes low-frequency communication about their policy frameworks and objectives, as well as high-frequency communication of views on current macroeconomic conditions, forecasts related to output and inflation, and the rationale for policy decisions.² Since the global financial crisis, the implementation of unconventional monetary policies and greater focus on financial sector stability have made communication even more important, especially as it relates to forward guidance.

Compared with other public institutions, central banks are often at the forefront of communication. The People’s Bank of China (PBC) is no different. Over the past few years, it has strengthened its communication and is keenly aware of the heightened global interest in information about the country’s monetary

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¹ See Bernanke (2007).

² On principles and practices of inflation-forecast targeting in advanced economies, see Adrian, Laxton, and Obstfeld (2018).

policy. The increase in the number of press conferences and speeches has coincided with sharp stock market adjustments, changes to the exchange rate framework, interest rate liberalization,³ and greater financial market volatility in 2015–16. However, communication has not yet become as potent a policy tool as in many advanced economies (such as at the US Federal Reserve or the Bank of England) and some important emerging markets.

In many respects, China is at a communications crossroads, driven both by domestic and, increasingly, external factors. Financial and external sector liberalization and greater reliance on price- and interest rate-based allocation of resources likewise make communication more important. Given the country's global footprint and increasing financial sector links, including through different bond and equity connect schemes, this is also true for the international community. As the country moves toward a more flexible exchange rate in conjunction with a monetary policy framework that relies more on short-term interest rates, better communication will significantly improve the effectiveness of monetary policy, reduce excessive volatility, and foster financial sector stability.

This chapter discusses China's unique institutional setup and provides background information about the PBC's main communication channels. The chapter reviews the relevant literature and empirically analyzes the effect of the PBC's communication on financial markets. It concludes with recommended policy actions to increase monetary policy effectiveness and to reduce volatility.

CHINA'S UNIQUE INSTITUTIONAL SETUP

Compared with other central banks in advanced economies or emerging markets with modern policy frameworks, China's central bank communication is more constrained. This is due to its unique institutional arrangements. In particular, China has multiple and overlapping objectives across institutions. The key constraints are as follows:

First, the PBC does not have full decision-making power over money supply targets and interest rate policy, and it has only limited operational independence at the monetary policy instrument level. Thus, the central bank is constrained in the information and forward guidance that it can convey. At the same time, the PBC drafts and executes monetary policy and has some operational

³ On May 11, 2015, the PBC expanded the upper limit of the deposit rate floating range from 1.3 times to 1.5 times the benchmark rate; on August 26, 2015, the central bank completely liberalized the upper limit of deposit rates with fixed terms longer than one year; and on October 24, 2015, it cancelled the deposit interest rate upper limit of commercial banks and rural cooperative financial institutions. On August 11, 2015, the PBC announced that the CNY/USD (Chinese yuan/US dollar) rate should refer to the closing rate of the previous day. On December 11 that year, the CFETS CNY index was first released by the China Foreign Exchange Trade System (CFETS) to reinforce the reference to the basket of currencies. Since February 2016, the CNY/USD fixing rate mechanism consisting of the closing rate and the currency basket has been forming gradually and the transparency of the mechanism has increased.

independence, such as in setting short-term interest rates through open market operations, short-term liquidity operations, or rates on standing and medium-term lending facilities. However, key decisions need to be approved by the State Council (China's equivalent to a government cabinet).⁴ Approval is needed, for example, for changes in the benchmark interest rate, reserve requirements, and the setting of annual monetary aggregates.⁵ For these key policy instruments, the PBC usually proposes policy plans when key economic indicators such as GDP growth and inflation deviate from the targets set at the beginning of each year by members of the State Council, who then review the plans and make the final decision (HUANG, GE, and WANG 2018). These members also regularly approve the wording of the monetary policy stance (Box 14.1 explains terminology).

Second, monetary policy decisions are the result of consensus-building among various stakeholders. State Council members have a broad range of economic and financial sector objectives, and requests for monetary policy changes can be submitted to the State Council not only by the PBC but also by other ministries or agencies. From the central bank's perspective, therefore, both the outcome and the timing of important monetary policy decisions are uncertain, limiting the PBC from providing forward guidance. As the implementing agency, the PBC publishes all monetary policy decisions. Moreover, important PBC personnel and budget decisions go beyond the PBC's remit. The PBC governor is nominated by the premier of the State Council, approved by the National People's Congress (or its standing committee when the congress is not in session), and finally appointed and dismissed by the country's president.⁶ The PBC budget, in turn, is part of the central government's budget and supervised by the financial department of the State Council.

Third, China's monetary policy has numerous objectives. According to the Law of the People's Republic of China on the PBC, "the objective of the monetary policy shall be to maintain stability of the value of the currency and thereby promote economic growth." The PBC is not an inflation-targeting central bank and its objectives go beyond price stability. As the previous PBC governor stated, "the annual objectives of the PBC mandated by the Chinese government have been maintaining price stability, boosting economic growth, promoting employment, and broadly maintaining balance of payments" (ZHOU 2016a). In addition, the 2017 PBC Work Conference called for monetary policy to balance among economic growth, economic reform, economic structure, household welfare, and financial stability considerations. These multiple objectives often involve trade-offs and reduce transparency.⁷

As China's monetary policy framework is increasingly moving from using quantitative targets to a more price-based framework, effective central bank

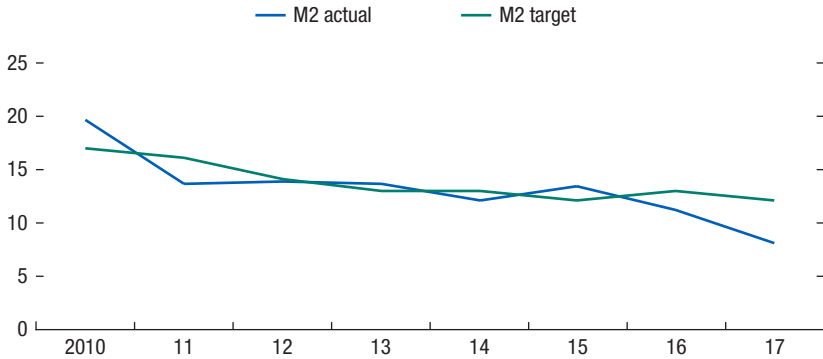
⁴ See Article 2 of the General Rules in the People's Bank of China Law.

⁵ See Article 5 of the General Rules in the People's Bank of China Law.

⁶ Deputy governors are appointed and dismissed by China's premier.

⁷ On transparency, see Dincer and Eichengreen (2014).

Figure 14.1. Monetary Aggregate M2 Growth, 2010–17
(Percent)



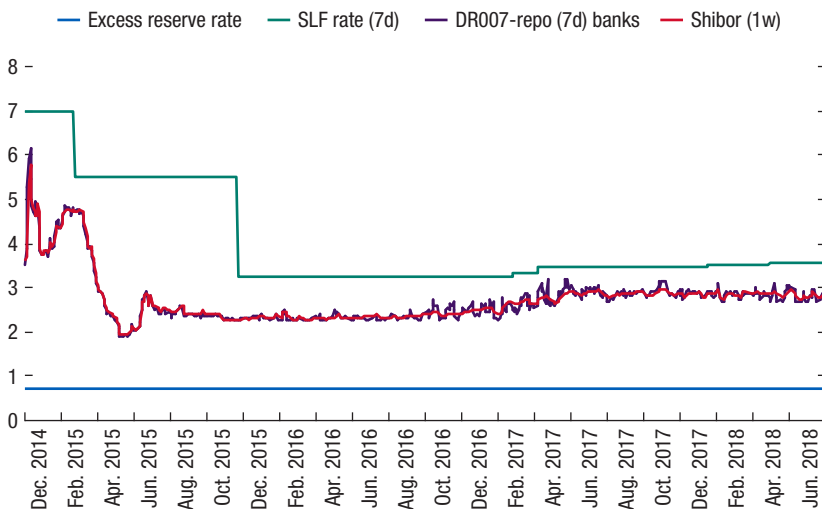
Source: *Report on the Work of the Government* 2010 through 2017; and CEIC.

Note: M2 = intermediate quantitative monetary target.

communication is becoming even more important. As summarized in HUANG, GE and WANG (2018), the PBC's intermediate targets are threefold: quantity-based money supply and bank credit, as well as priced-based market interest rates. Successive waves of interest rate liberalization, which started with money market rates and culminated with the formal elimination of the ceiling on bank deposit rates in 2015, have facilitated the transition toward a modern price-based monetary policy framework. While the process is not complete, the government in 2018 reiterated its commitment to deepen reforms to make both interest rates and the exchange rate more market based (LI 2018).

The emphasis on quantitative targets has declined. Since 1994, China has had quantitative monetary targets. However, reflecting financial innovation and a rapidly changing financial system structure, its intermediate quantitative monetary target, M2, is correlated less and less with inflation and growth (MA 2017). In addition, the M2 outturn has deviated from the target over the past couple of years (Figure 14.1). As a further indication that emphasis on quantitative targets has declined, the 2018 *Report on the Work of the Government* (Annual Work Report) did not specify a specific target or projection for the monetary aggregate (M2) or for credit aggregates (such as total social financing). Compared to previous Annual Work Reports, this was an important step forward. Instead, the language was more vague: “Our prudent monetary policy will remain neutral, with easing or tightening as appropriate. We need to make sure that the value of M2 money supply, credit, and aggregate financing ensure a reasonable, stable level of liquidity” (LI 2018).

Interest rate liberalization and other reforms have allowed the PBC to improve its policy framework. Focus is increasing on short-term money market rates, that

Figure 14.2. Interest Rate Corridor, 2014–18*(Percent)*

Sources: CEIC; and WIND Economic Database (www.wind.com.cn).

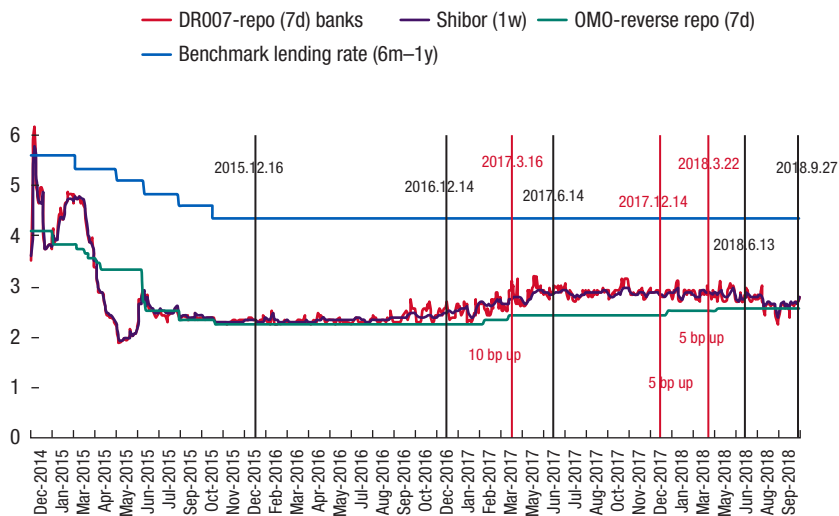
Note: DR007 = 7-day (7d) interbank pledged repo rate; Shibor (1w) = 1-week Shanghai interbank offered rate; SLF (7d) = 7-day short-term liquidity facility.

is, the 7-day interbank pledged repo rate (DR007).⁸ In the 2016, third-quarter Monetary Policy Executive Report (MPER), the PBC stated that “DR007 moves around the open market operation 7-day reverse repo rate. The DR007 can better reflect the liquidity condition in the banking system and has an active role to cultivate the market base rate.” Although the PBC has not confirmed DR007 as the policy interest rate yet, it is closely watched by the market. The central bank uses open market operations (OMOs) and the corresponding 7-day OMO repo/reverse repo rate to signal policy changes. For example, from the end of 2015 until mid-2018, the PBC changed OMO rates on seven occasions, of which three coincided with increases in the US federal funds rate. Combined with interest rates for standing lending facilities and remunerated required or excess reserves (see Table 14.1), the monetary policy framework effectively provides a corridor, that is, an upper and lower bound (Figures 14.2 and 14.3).

China’s monetary policy framework remains in transition and is currently a hybrid (see MA and GUAN 2018). On the one hand, despite formal interest rate liberalization, banks are still guided by corresponding deposit and lending benchmark rates; changes to these rates go beyond the authority of the PBC and require State Council consent. On the other hand, other policy rates, such as

⁸ Compared to another 7-day repo rate, which covers banks and nonfinancial institutions (R007), DR007 is the weighted average of participating banks.

Figure 14.3. PBC Policy and Target Rate, 2014–18
(Percent)



Sources: CEIC; and WIND Economic Database (www.wind.com.cn).

Note: Vertical black bars show recent changes in the US federal funds rate; those in red reflect changes in the People's Bank of China's open market operation rates. Benchmark lending rate is six months to one year (6m–1y). bp = basis points; DR007 = 7-day (7d) interbank pledged repo rate; OMO = open market operations; Shibor (1w) = 1-week Shanghai interbank offered rate.

medium-term lending and the pledged supplementary facilities (see Table 14.1), as well as the use of instruments such as changes in required reserves, undermine transparency and complicate communication (Figures 14.4 and 14.5 and Table 14.1).

In April 2018, the PBC indicated its intention to move toward a unified interest rate framework. “In some aspects, the interest rates are ‘running on two tracks,’ that is, there are benchmark interest rates for deposits and loans, while the money market rates are fully liberalized. We have eased restrictions on deposit and loan rates, and commercial banks have been offering deposit and loan rates higher or lower than the benchmark interest rate based on their operating conditions. As a matter of fact, the best tactic is for us to gradually unify the two tracks of interest rates, and we are doing just that in the market-based reforms” (PBC 2018a, 2018b).

EVOLVING COMMUNICATIONS CHANNELS

PBC communication, though still evolving, takes place primarily through four main channels (Box 14.1 reviews key terms to describe China's monetary policy and use of window guidance):

TABLE 14.1.

People's Bank of China Policy and Asset Rates		
Policy Tools	Meaning	Tenor
Benchmark interest rate	People's Bank of China sets the benchmark interest rate as reference rates for deposits and lending. It is the official policy rate. It has not changed since October 2015.	Less than 6 months, 6 months to 1 year, 1–3 years, 3–5 years, more than 5 years
OMO repo and reverse repo	Short-term collateralized loans and borrowing, with a direct effect on interbank liquidity conditions. At present, the 7-day reverse repo is used more frequently in practice, combined with the occasional use of the 14-, 28-, and 63-day reverse repo. Since 2013, the 91- and 182-day repo have not been used; the 21-day repo is rarely used.	7-, 14-, 21-, 28-, 91-, 182-day
OMO People's Bank of China bill yield	Money supply changes by issuing central bank bills. Not in use since November 2013.	3-month, 6-month, 1-year, 3-year
Medium-term lending facility	An instrument to provide medium-term base money to commercial or policy banks that meet the requirements of macroprudential management. Aims to adjust the medium-term funding cost of financial institutions and then the funding cost of the real economy. Created in September 2014.	3-month, 6-month, 1-year
Standing lending facility	A liquidity supply channel of the People's Bank of China to meet the temporary liquidity demand of commercial banks and rural cooperative financial institutions. Seen as the upper bound of the interest corridor. Created in early 2013.	Overnight, 7-day, 1-month,
Pledged supplemental lending	Long-term and large amounts of financing to support the key areas and weak links of the national economy. Created in April 2014.	Long term
Targeted medium-term lending facility	Stable source of funding for financial institutions based on growth of their loans for small and private firms.	Long term
Short-term liquidity operations	Used to stabilize market expectations and prevent financial risk when there is a temporary fluctuation in the liquidity of the banking system. Created in January 2013.	Very short term
Required reserve ratio	Share of deposits that banks are required to hold at the People's Bank of China. Required reserve ratio changes can have long-term and large liquidity implications.	
Excessive reserve rate	Rate on excess reserves. Seen as the lower bound of the interest rate corridor.	

(continued)

TABLE 14.1. (continued)

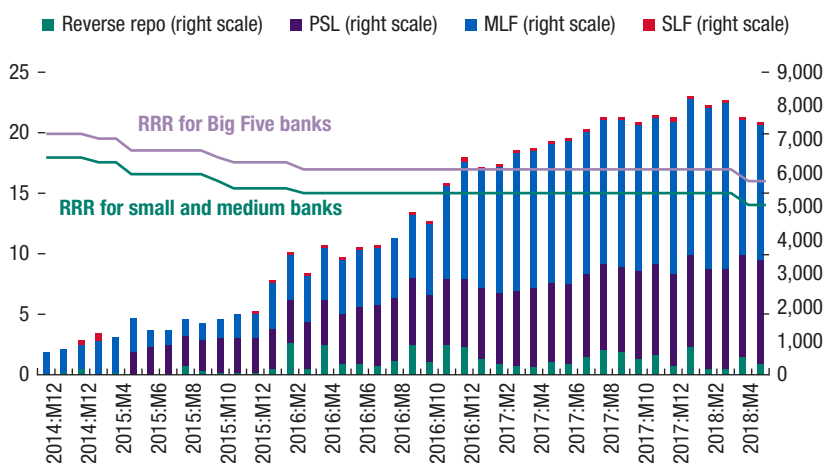
People's Bank of China Policy and Asset Rates		
Policy Tools	Meaning	Tenor
Money Market Rate		
Shibor	Shanghai interbank offered rate. The reference rate based on the interest rates at which banks offer to lend unsecured funds to other banks in the Shanghai wholesale money market.	Overnight, 1-week, 2-week, 1-month, 3-month, 6-month, 9-month, 1-year
R007	The weighted average 7-day repurchase (repo) rate for all financial institutions including all pledged repurchase transactions in the interbank market.	7-day
DR007	The weighted average 7-day repurchase rate in which a deposit institution uses interest rate bonds as a pledge in the interbank market.	7-day
FR007	Interbank fixing 7-day repo rate, a benchmark rate based on repo trading rate for the interbank market.	7-day
CD rate	Rate on certificates of deposit issued by depository financial institutions in the interbank market.	
Bond Market		
Short-term commercial paper	Unsecured, short-term debt instrument issued by nonfinancial corporations in the interbank bond market, typically for the financing of accounts receivable and inventories and meeting short-term liabilities.	1-month, 3-month, 6-month, 1-year
Medium-term notes	Debt financing instruments issued by nonfinancial corporations in the interbank bond market.	1-month, 3-month, 6-month, 1-year, 5-year
Treasury bonds	Bonds issued by the government to raise fiscal funds.	3-month, 6-month, 1-year, 3-year, 5-year, 7-year, 10-year, 30-year
Equity Market Rate		
Shanghai Stock Exchange composite index return	The daily return on the exchange's composite index, a stock market index of all stocks that are traded at the Shanghai Stock Exchange.	

Source: People's Bank of China.

Note: OMO = open market operations.

Figure 14.4. People's Bank of China Hybrid Monetary Policy Framework, 2014–18

(Percent; right scale, billions of renminbi)



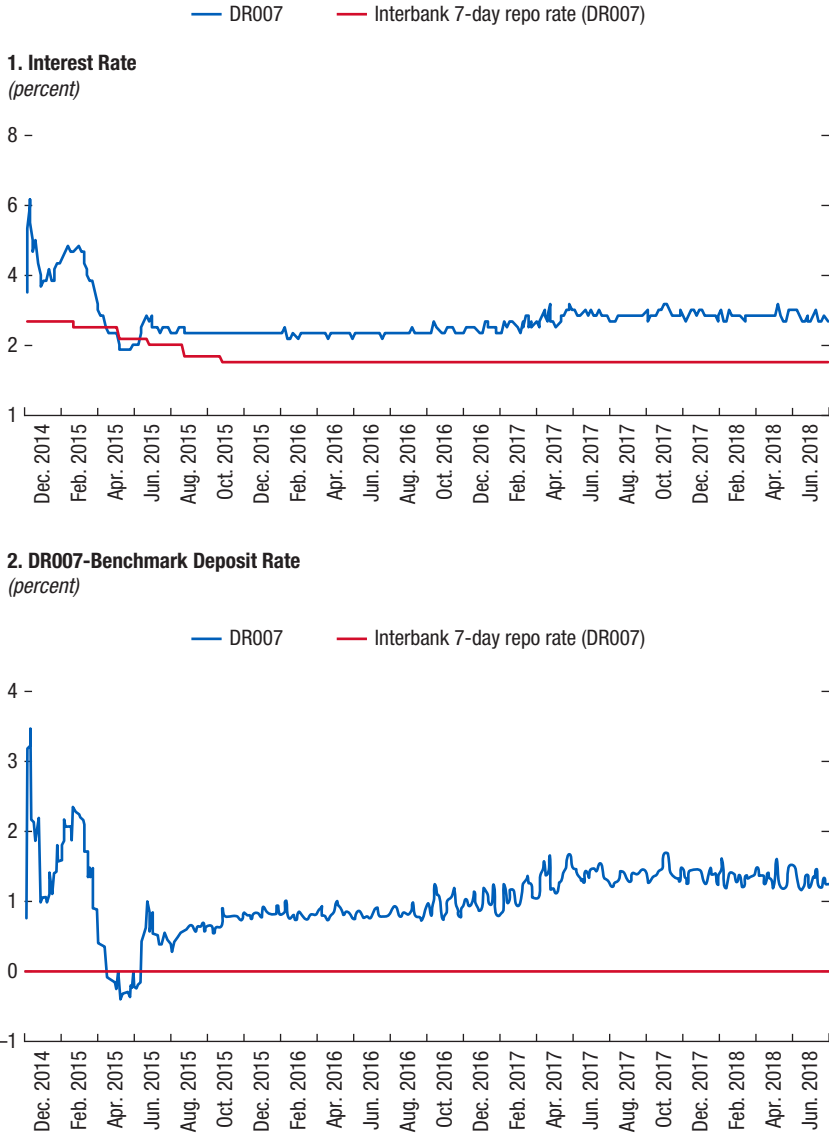
Source: CEIC.

Note: MLF = medium-term lending facility; PBC = People's Bank of China; PSL = pledged supplementary lending; RRR = required reserve ratio; SLF = short-term lending facility.

- *Monetary Policy Executive Reports (MPERs)*: First issued in 2001, the PBC now releases its MPER quarterly. It covers most recent monetary policy decisions; an analysis of output, prices, and money supply developments; information about important sectors; and an assessment of prospects for China's macroeconomic development. Generally, report coverage is more backward looking, but increasingly it provides useful technical and operational information—often within boxes—and, even more recently, some forward-looking information.
- *Press releases on monetary policy committee meetings*: The first monetary policy committee meeting was in 1997 and the meeting now takes place at the end of each quarter. Since 2009, the PBC has published press releases one or two days following the meeting. The actual meeting dates, however, are not announced ahead of time and are only posted on the PBC's website following the meeting.
- *Speeches and press conferences*: Oral communication comprises public speeches by the governor and deputy governors, as well as press conferences.⁹ Public

⁹ Both governors and relevant PBC staff are available to speak to journalists. The PBC's governor gave 63 percent of 86 speeches delivered by the governor or deputy governors between 2007 and the end of 2017. Out of 140 press conferences during the same period, the governor took questions or gave interviews in about 20 percent of them. Oral communication surged in 2015–16, when important policy changes took place, such as interest rate liberalization, changes in the exchange rate regime, and a sharp adjustment in equity prices. Communication tends to be more ex post, with a focus on explanations rather than guiding expectations, reflecting—among other things—China's unique institutional setup and the PBC's lack of operational independence.

Figure 14.5. Widening of Interbank-Conventional Deposit Rate, 2014–18



Sources: CEIC; and WIND Economic Database (www.wind.com.cn).

Note: DR007 = 7-day interbank pledged repo rate.

officials regularly give speeches at public conferences or international central bank governor summits. While the contents center around the topics of the conference and cover the PBC's policy stance, sometimes speakers talk about future developments in a specific area. Press conferences are usually scheduled after policy announcements to further explain the rationale for decisions.

- *Open market operation notices*: To better explain the rationale of open market operations, daily notices have been standard since January 2016.¹⁰ Increasingly, these notices provide contextual information by adding phrases such as “given ample liquidity, the PBC has intervened to keep liquidity stable.”¹¹

The PBC is committed to providing more timely information. In 2018, the PBC reiterated that it is committed to “continuously improve the central bank’s credibility and transparency” and would “strengthen its policy interpretation and information disclosure, deliver its policy intentions in a timely way and reasonably guide market expectations” (PBC 2018a). As part of the response to the increasing demand for timely information, the PBC now also communicates regularly through social media, such as Weibo (China’s Twitter equivalent). As Figure 14.6 shows, within only a few years the PBC has already reached a very large following on social media in both absolute and per capita numbers, compared with major central banks.

LITERATURE REVIEW

An increasing body of literature is studying the effect of central bank communication. Existing research focuses on central banks in developed economies, mostly the US Federal Reserve Bank, the European Central Bank, and the Bank of England. Generally speaking, these analyses examine the effects of monetary policy announcements, minutes of monetary policy committee meetings, regularly published reports, interviews and speeches, and congressional testimony or parliamentary committee hearings. An early survey of the literature is Blinder and others (2008). This chapter follows much of this literature and relies on market-based event studies.¹² Specifically, the chapter investigates whether PBC communication affects asset prices in China’s financial market in a manner indicating that the communication contains relevant information.

¹⁰ The PBC started conducting weekly open market operations in 2003 and has held biweekly operations since 2004.

¹¹ From 2017 to June 30, 2018, the PBC published 179 such notes, 122 of them on days with open market operations.

¹² A prominent paper in the event-study analysis of communication is Gürkaynak, Sack, and Swanson (2005), which focuses on Federal Reserve monetary policy announcements. Kohn and Sack (2003) examine the effects of a broader set of Federal Reserve communications. Reeves and Sawicki (2007) carry out similar analysis for the Bank of England Inflation Report. More recently, Hansen, McMahon, and TONG (2018) show that central bank communication on risks and uncertainty is an important source of information for long-maturity yields. See also Tobback, Nardelli, and Martens (2017).

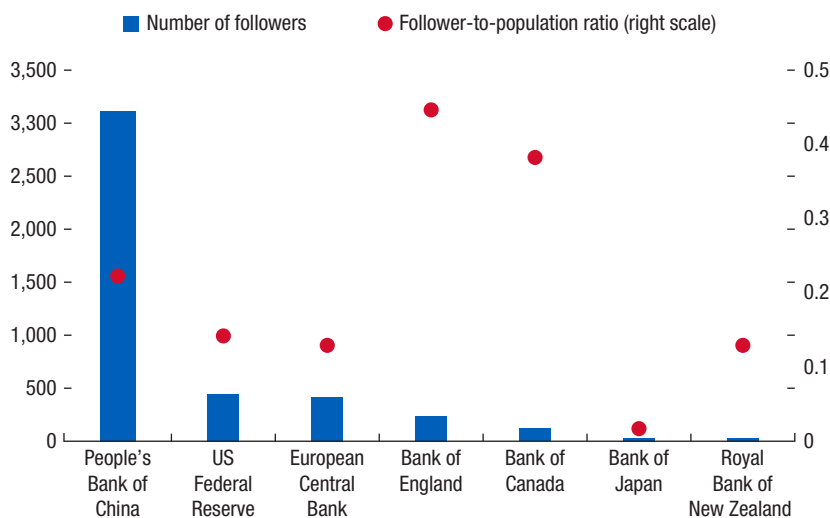
Some analysis codes the communication contents by subjectively assigning values to the texts that are perceived as dovish or hawkish (Jansen and De Haan 2005; Ehrmann and Fratzscher 2007; Berger, Nitsch, and Lybek 2006), or using semantic orientation and text classification to quantify dimensions of the text (Lucca and Trebbi 2009; Hansen and McMahon 2016; Hansen, McMahon, and Prat 2018). These techniques are useful in identifying the direction of communication and can augment the type of analysis undertaken in this chapter. However, two obstacles hamper applying these methods to the Chinese language. First, dictionary methods do not work well for China given the different language structure. Second, communication from the PBC, especially in public speeches, is noncommittal and tends to be carefully drafted. Garcia-Herrero and Girardin (2013) compute subjective “hawkish” and “dovish” scores for previous PBC Governor Xiaochuan Zhou and monetary policy committee member Gang Fan. But such a manual coding approach can only be applied to small amounts of communication, and restricting the analysis coverage may come with the risk of biased results. Hence, this analysis focuses on the fact that PBC officials come out to speak publicly more than on the content of their speech. Further text analysis is an important direction for future studies on PBC communication.

Central bank communication in emerging market economies has only more recently attracted greater attention. For example, Luangaram and Wongwachara (2017) implement text analysis techniques previously applied for advanced economies to analyze communication by the Bank of Thailand. For China, Garcia-Herrero and Girardin (2013) use the hawkish-dovish communication classification described to test the impact of PBC communication on repo-market volatility and trading volume. SHU and Ng (2010) compile indices reflecting the direction and intensity of the PBC's monetary stance based on the quarterly MPERs and Monetary Policy Committee meeting minutes. SUN (2013) studies the impact of PBC communication on the macroeconomy, including GDP, inflation, and industrial output.

This chapter contributes to the existing literature in the following ways: First, it comprehensively reviews China's unique institutional setting, which is paramount to understanding its evolving communication channels. Second, in addition to communication tools analyzed elsewhere (that is, quarterly MPERs, quarterly Monetary Policy Committee meeting minutes, as well as speeches and interviews), the study is novel in that it includes OMO notices. As discussed previously, the PBC considers these informative notices an important communication tool and started including them in 2016 (so-called small notes). Third, the chapter analyzes the transmission of communication to different markets.

EMPIRICAL ANALYSIS

The empirical event study focuses on whether PBC communications contain news for financial market variables. Consistent with the central bank communication literature, this analysis is interested in the effect of communication on the intermediate target of monetary policy, that is, short-term interest rates. The first

Figure 14.6. Central Bank Social Media Presence, 2018*(Thousands, left scale; percent, right scale)*

Source: Weibo account of the People's Bank of China; Twitter accounts of the US Federal Reserve, the European Central Bank, the Bank of England, the Bank of Canada, the Bank of Japan, and the Royal Bank of New Zealand; and World Development Indicators.

step is to construct variables that capture PBC communication events. As summarized in the previous section, the PBC communicates with the market in four main ways: (1) quarterly MPERs; (2) Monetary Policy Committee meeting minutes (minutes); (3) press conferences and speeches by the governor, deputy governors, and the then-chief economist of the PBC Research Bureau (oral); and (4) informative OMO notices. The PBC's website was searched to collect the date and time at which the MPER, minutes, press conference transcripts, texts of speeches, or OMO notices are posted. This information allows a dummy variable to be created for every trading day¹³ for each communication format: $D(MPER)$, $D(Minutes)$, $D(Oral)$, and $D(OMO Notice)$, with 1 indicating that the PBC communicates with the market in a certain format and 0 otherwise. An aggregate dummy, $D(PBC Communication)$, was also created, which is 1 if the PBC has utilized at least one of the four communication formats, and 0 otherwise. For oral communication, the analysis is interested in whether the effect of communication from the governor differs from that of others, so it also documents the person who attended the press conference or who delivered the speech. Hence, $D(Oral)$ is disaggregated into $D(Oral - PBCGOV)$ and $D(Oral - Others)$.

¹³ When the post time was between 3:00 pm and 9:00 am the following morning, the date was adjusted to the next trading day.

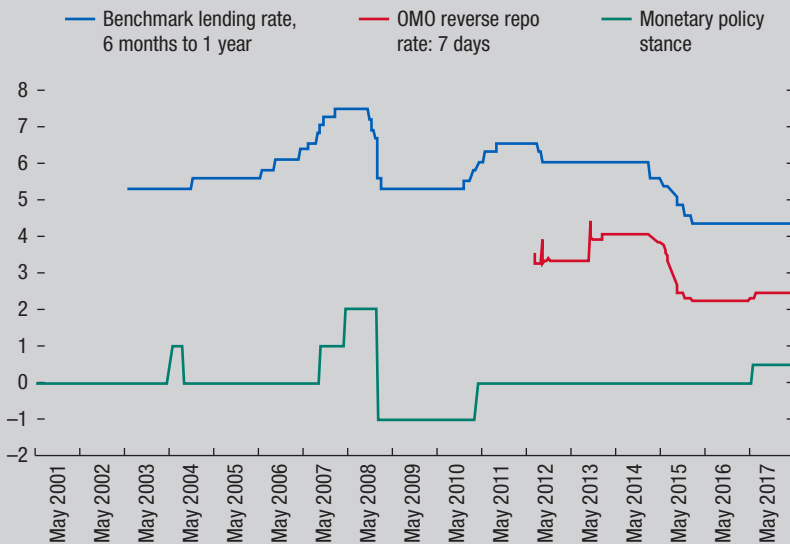
Box 14.1. Communication Terminology

Monetary Policy Stance

As do other central banks, the People's Bank of China uses specific terminology to communicate its policy stance. The signaling, however, is quite infrequent (usually during the Work Conference in December) and requires State Council approval.

Five categories can be identified: (1) moderately loose, (2) moderately tight, (3) tight, (4) prudent, and (5) prudent and neutral.¹ While categories (1) to (3) are straightforward, the distinction between "prudent" and "prudent and neutral" is more ambivalent, with the latter assumed to be somewhat tighter than "neutral." To visualize the potential relationship between the respective monetary policy stances and policy interest rates,² the following scoring is used: -1 for "moderately loose," 0 for "prudent," +0.5 for "prudent and neutral," +1 for "moderately tight," and +2 for "tight." In Figure 14.1.1, the red line shows the monetary policy stance, the blue line shows changes in the benchmark lending rate maturing in six months to one year, and the green line is the 7-day reverse repo open market operations (OMO) rate.

Figure 14.1.1. Monetary Policy Stance and Policy Rates, 2001–17
(Percent)



Source: CEIC.

Note: OMO = open market operations; repo = repurchase.

Changes in language about the monetary stance in Monetary Policy Executive Reports (MPERs) tend to be associated with changes in the benchmark interest rate; a positive change in the score, reflecting a tightening, is associated with an increase in benchmark

Box 14.1. Communication Terminology (continued)

interest rates (in the following quarter), and vice versa. However, as the figure shows, at times communication lags the actual decision about a benchmark rate change.

That terminology provides the PBC with significant flexibility and is reflected in the fact that during periods of a “prudent” monetary policy stance, the benchmark interest rate has both increased and decreased.

Window Guidance

In addition to written and oral communication disseminated publicly, the PBC provides “guidance” to financial institutions that affect their behavior. This “window” guidance can be related to credit growth, lending to priority sectors, and so on. It can be an effective tool, but it undermines transparency and interest rates as the main signal of monetary policy conditions.

¹ See ZHOU (2016a) for a classification. The term “prudent and neutral” was added for the first time at the beginning of 2017.

² The 7-day interbank pledged repo rate, DR007, is one of the important benchmark rates, but has not yet been confirmed as a policy interest rate.

Short-term money market rates are an important focus for the PBC. The analysis therefore examined the effects of communication on the Shanghai interbank offered rate (Shibor), the collateralized interbank repo rate between depository financial institutions (DR007), and the collateralized interbank repo rate between all financial institutions (R007). Moreover, the focus is on the impact of the PBC’s communication on short-term and medium-term commercial paper (STN and MTN), Treasury bonds, and equity markets. Table 14.1 lists the details of these market rates.

To control for other factors that may affect market interest rate movements, the following are included: (1) a dummy variable $D(\text{Macro Release})$ to indicate the release of the main macroeconomic indicators, including the consumer price index (CPI), GDP, Official Purchasing Managers Index and Caixin Purchasing Managers Index (PMI), and foreign trade and foreign exchange reserves; (2) a dummy variable $D(\text{CEWC})$ to indicate the date of the government’s annual Central Economic Work Conference, which determines the direction of economic policy for the following year¹⁴; and (3) a dummy variable $D(\text{Rate Change})$ to indicate changes in PBC monetary policy instruments. For the latter, changes in the benchmark interest rate, required reserve ratio, OMO, and other instrument rates—that is, the standing lending liquidity facility (SLF), short-term

¹⁴ There are other regularly held meetings at the central level, such as the Politburo meetings, that may also have implications for monetary policy. By adding a dummy variable to indicate the date of the Politburo meetings with economic issues discussed, it is found that the Politburo meetings do not significantly affect financial market rates and this additional variable does not affect the results of PBC communication (results are available upon request). Therefore, Politburo meetings in the following analysis are not controlled for in order to keep a concise specification.

liquidity operations (SLO), the medium-term lending facility (MLF), and the pledged supplementary lending (PSL)—are included.

The event-study analysis covers trading days during 2013–17. The summary statistics for the explanatory variables are reported in Annex Table 14.1.1, including communication and control variables, and various market rates in Annex Table 14.1.2. On average, the PBC communicated with the market on about 25 percent of all trading days. Speeches or press conferences are the most common format of communication, taking place nearly every six trading days (16.1 percent of days in the sample). OMO information notices are the next most frequent, occurring on 7.8 percent of the days, but they have become much more frequent since February 2017. MPERs represent 1.6 percent; and Monetary Policy Committee meeting minutes, 1.5 percent.¹⁵ On days with communication, the average interest rates of the key assets are higher, reflecting more communication toward the end of the sample, when interest rates had risen. The standard deviations of these rates seem to be larger for longer-term assets and smaller for shorter-term assets than on days without communication.

The kernel density of the daily absolute change of the DR007 (Figure 14.7) and 3-month short-term notes (Figure 14.8) for various categories of communication are plotted. These plots show that both communication and control variables indeed have some impact on market prices. Surprisingly, minutes releases are associated with news for repo rates (DR007), but this effect is not reflected in short-term notes. Oral communication, PBC interest rate changes, and OMO notices are associated with relatively higher market reaction for both assets.

Baseline Results: OLS Analysis of Communication News

First, an ordinary least squares (OLS) analysis is conducted by estimating the following equations:

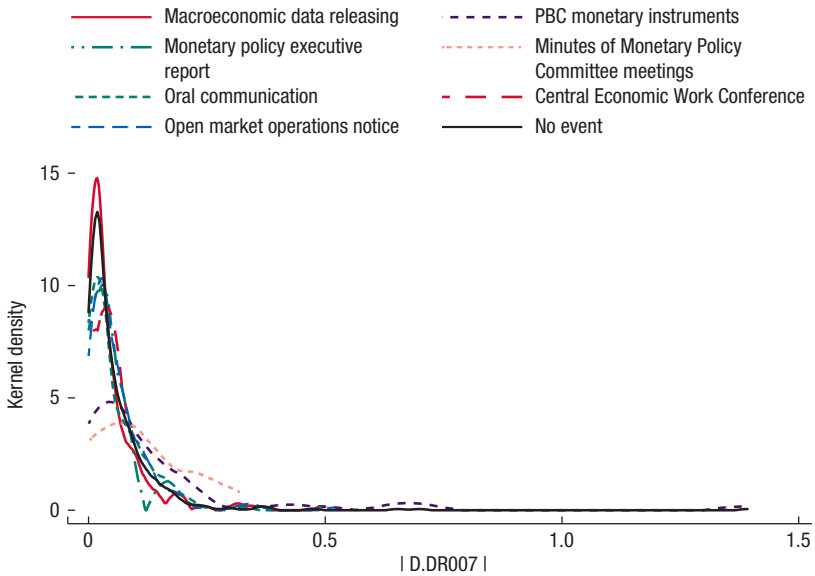
$$|\Delta r_t| = \alpha + \beta D(\text{Communication})_t + \gamma_1 D(\text{Macro Release})_t + \gamma_2 D(\text{CEWC})_t + \gamma_3 D(\text{Rate Change})_t + \varepsilon_t \quad (14.1)$$

$$|\Delta r_t| = \alpha + \beta_1 D(\text{MPER})_t + \beta_2 D(\text{Minutes})_t + \beta_3 D(\text{Oral} - \text{PBCGOV})_t + \beta_4 D(\text{Oral} - \text{Other})_t + \beta_5 D(\text{OMO Notice})_t + \gamma_1 D(\text{Macro Release})_t + \gamma_2 D(\text{CEWC})_t + \gamma_3 D(\text{Rate Change})_t + \varepsilon_t \quad (14.2)$$

These regressions, as in other event studies, identify the average reaction of market prices to the different types of communication events; the identifying assumption is that any systematic reaction on communication days is driven by the

¹⁵ Since 2018, the PBC has taken additional measures to further strengthen policy transparency and communication by responding to public concerns in a timely manner and guiding market expectation. For instance, to better explain the rationale of OMOs, the PBC released 85 notices during the 123 trading days in the first half of 2018. In addition, the PBC has strengthened traditional channels, such as holding more press conferences (conducting 17 press conferences or interviews during the first six months of 2018), and providing deeper analysis and more informative MPERs.

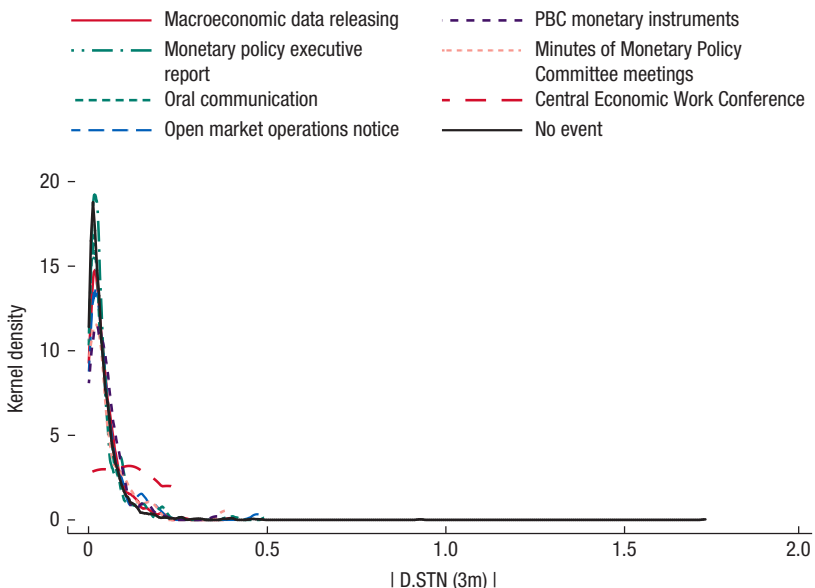
Figure 14.7. Kernel Density of Daily Absolute Changes of 7-Day Interbank Pledged Repo Rate (DR007)



Source: Authors' calculations.

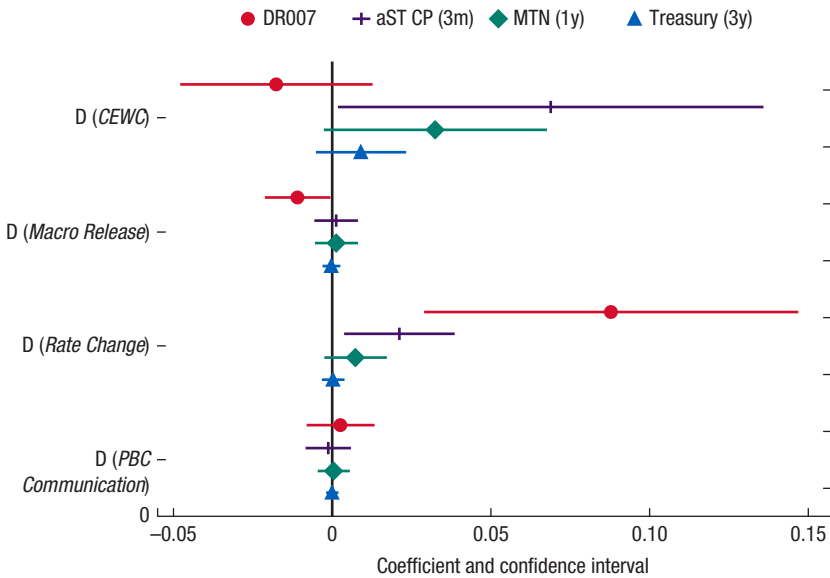
Note: PBC = People's Bank of China.

Figure 14.8. Kernel Density of Daily Absolute Changes of 3-Month Short-Term Notes



Source: Authors' calculations.

Note: D.STN (3m) = daily changes to 3-month short-term note; PBC = People's Bank of China.

Figure 14.9. Estimated Coefficients of Aggregated Communication Events

Source: Authors' calculations.

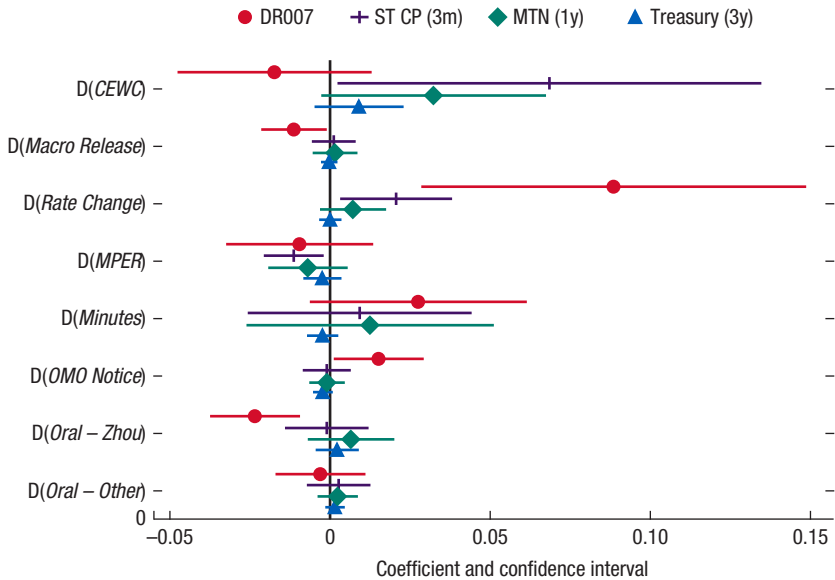
Note: CEWC = Central Economic Work Conference; DR007 = 7-day interbank pledged repo rate; MTN (1y) = 1-year medium-term note; PBC = People's Bank of China; ST CP (3m) = 3-month short-term commercial paper; Treasury (3y) = 3-year Treasury.

communication event. The dependent variable is, as for the kernel densities, the daily absolute change in market rates. The advantage of using the absolute value is that the market reaction to the communication irrespective of the direction of that reaction can be measured. The key test concerns the sign of the communication event dummy variable. When communication is associated with news, it would cause a market adjustment and thus positive β coefficient. If, however, a communication event systematically reduced the noise in the market, it would be associated with less market adjustment than on other trading days and the estimated w coefficient would be negative.

The key estimation results, correcting the standard errors using the Huber-White sandwich estimators, are presented visually in Figures 14.9 and 14.10; the full regression results are presented in Annex Tables 14.1.3 and 14.1.4.

Figure 14.10 suggests that PBC communication mainly affects short-term assets, while neither monetary policy instruments nor communication systematically move longer-term markets much, at least in a single day's time frame. More specifically, the main results are the following:

1. First, as expected, policy instrument changes are associated with market news. However, PBC communication, in general, does not move the market too much, suggesting that the effectiveness of PBC communication is somewhat limited. As reflected in Annex Table 14.1.3, the coefficients of $D(\text{Rate Change})$ are significantly positive for all assets with maturities less than 3 months, while

Figure 14.10. Estimated Coefficients of Disaggregated Communication Events

Source: Authors' calculations.

Note: CEWC = Central Economic Work Conference; DR007 = 7-day interbank pledged repurchase rate; Minutes = minutes of Monetary Policy Committee meetings; MPER = Monetary Policy Executive Report; MTN (1y) = 1-year medium-term note; OMO = open market operations; Oral = oral communication; ST CP (3m) = 3-month short-term commercial paper; Treasury (3y) = 3-year Treasury.

the coefficients of $D(PBC\ Communication)$ are only significant for the volatility of 1-week Shibor and 1-month short-term notes. Communication slightly calms markets, but does not move the market much.

- Second, the release of quarterly MPERs tends to reduce the volatility of short-term notes. It acts as an important channel for the PBC to communicate with the market, as it contains a lot of operational details and sometimes forward-looking guidance, though not very often. As Annex Tables 14.1.3 and 14.1.4 show, MPERs are associated with a decline of 0.03 percentage point in the absolute change of 1-month short-term notes and 0.01 percentage point in that of 3-month short-term notes.
- Third, oral communication of public speeches, as well as press conferences, appears to calm the market. As Annex Table 14.1.3 shows, oral communication is associated with a decrease in the market news of Shibor 1-week, and 1-month short-term notes. Annex Table 14.1.4 shows that for the PBC's DR007 target rate, communication events by the governor, either speeches or press conferences, are associated with 0.023 percentage point less market movement. However, oral communication is irregular, and the timing of oral communication is usually determined by market conditions.

Effect on Volatility and the Timing of Communication

Even if there is no systematic effect on the average price in the market, another possibility is that communication events are associated with greater market volatility. OLS regressions do not separately model the volatility of the residuals; the regressions analysis discussed earlier did correct the standard errors on coefficients for heteroscedasticity and auto-correlation. General autoregressive conditional heteroscedastic (GARCH) models can address the possibility that time series models may violate homoscedasticity (constant variance of errors). These models are used extensively in financial econometrics as higher-frequency data tend to have periods of higher and lower volatility.

Specifically, and following Nelson (1991), the volatility effects of communication using an EGARCH methodology (a particular class of GARCH model) is explored. The advantage of an EGARCH model over a GARCH model is that it ensures that the conditional variance is positive and allows for the asymmetric response of the volatility to good and bad news. The EGARCH(1,1) specification features a conditional mean equation in which it is necessary to control for all the relevant variables that drive the mean to minimize the size and variance of residuals:

$$\Delta r_t = \gamma_0 + \gamma_1 x_t + \varepsilon_t, \quad (14.3)$$

where $\varepsilon_t \sim N(0, \sigma_t^2)$ and x_t contains any controls in the conditional mean equation. The conditional volatility equation, which measures the drivers of σ_t^2 , is:

$$\log \sigma_t^2 = \alpha_0 + \sum_k \theta_k D(\text{Comms}_k)_t + \alpha_1 \left(\frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right) + \lambda \left[\left| \left(\frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right) \right| - \sqrt{\frac{2}{\pi}} \right] + \phi \log \sigma_{t-1}^2, \quad (14.4)$$

where $D(\text{Comms}_k)_t$ indicates one of k included communication dummy variables, described previously.

To study the volatility effects while also ensuring that the dependent variables are stationary, the daily change of interest rates as the main dependent variable (Δr_t) is used (earlier, the focus was on market news given by the *absolute value* of the change in the interest rate). Given that the communication variables are dummy variables that could have a positive or negative effect on the level of the interest rate (depending on the message in the communication), in the mean equation the lag of the dependent variable (Δr_{t-1}) and the change in the 7-day repo rate are controlled for, but not for the communication event dummies.

Instead, the effect of communication events on volatility is allowed. However, as the EGARCH model is a nonlinear model, it does not always have a smooth likelihood function that is easily maximized. To ensure convergence of the estimates, more parsimonious models in this section than were utilized earlier are explored. In particular, the volatility effects of each of the four main communication events as used in equation (14.1) are explored. Then a more disaggregated approach that focuses on the marginal effects (over the average communication event) of $D(\text{MPER})$ and $D(\text{Oral} - \text{PBCGOV})$ is explored.

An average PBC communication *is associated with* higher volatility of short-term market rates (R007). The EGARCH results are presented in Annex

Table 14.1.5 and Annex Table 14.1.6. When the effect is disaggregated a bit further, it is found that the association is particularly strong for speeches by the PBC governor. However, one needs to be cautious in interpreting these findings. Especially for ad hoc events (such as an irregular press conference or speech), it could be that the volatility in the market leads the PBC to feel the need to comment. Even if the comment is calming, volatility could remain higher than usual and so the event is associated with high volatility. The EGARCH model attempts to control for this by modeling volatility as dependent on the volatility from the previous trading day as well as other covariates.

The alternative interpretation of these results is that the event causes this higher volatility. When the PBC initiates ad hoc communication, the markets receive not only the content of the communication but also the message that the situation was severe or worrying enough to warrant communication. Regular communication allows markets to focus on the message being delivered since the date for the message is set in advance, as is the case with the Bank of England inflation report or US Federal Open Market Committee meetings.

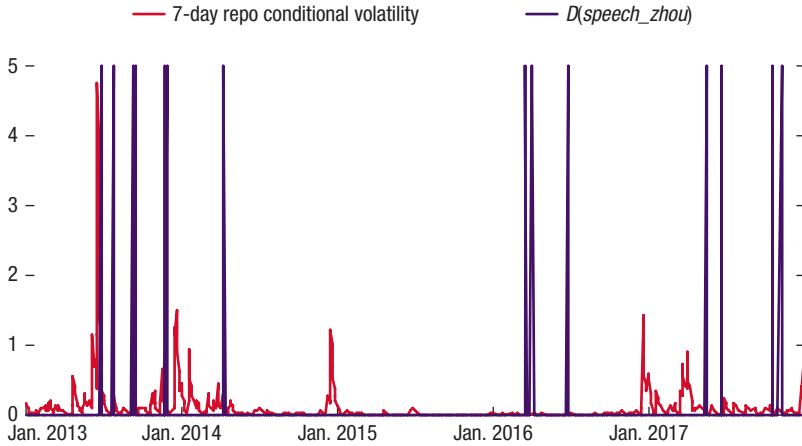
An advantage of the EGARCH methodology is that it provides an estimate of the conditional variance ($\hat{\sigma}_t^2$) from each asset market. Figures 14.11 and 14.12 show this estimated conditional variance for the 7-day repo market and the Treasury (3-year) market. These figures, augmented with indicators of speeches by the PBC governor, highlight that it is likely that both explanations are present in the data. In particular, speeches tend to be made irregularly and around episodes of higher volatility (as well as after the liberalization of interest rate markets in 2016). In some cases, the speeches are followed by increased volatility, and in others volatility falls from elevated levels.

Use and Impact of OMO Notices

Open market operations are the important way in which the PBC intervenes in the market. The transmission efficiency from OMO interest rates to the targeted market rates largely determines how monetary policy works. Like other central banks, the PBC conducts OMO frequently and publishes OMO notifications on its website. Usually, OMO notices plainly state that the PBC has conducted OMOs at a specific interest rate and amount. The frequency of OMO actions is depicted in Figure 14.13 as the purple triangles. In the sample of 1,249 trading days, the PBC conducted OMO interventions on 639 of them.

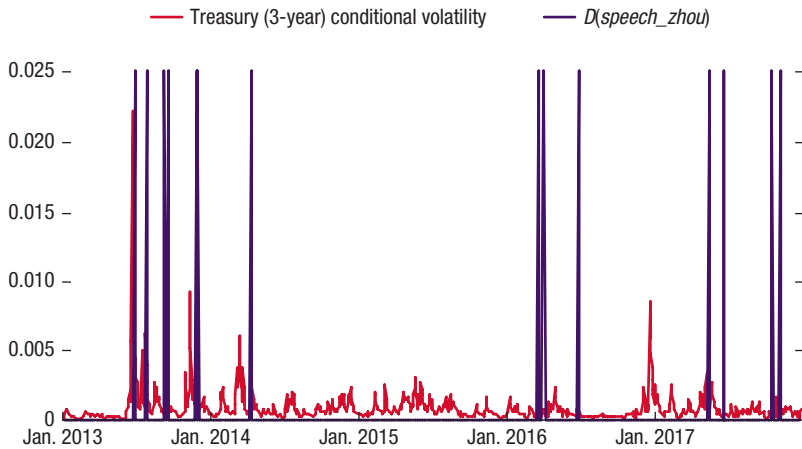
Since March 2016, however, the PBC at times has added short sentences about market performance (that is, about liquidity and volatility) to explain the reason behind the OMOs, including information about the injection or withdrawal of liquidity, or even the reason for not intervening in the market.¹⁶ These informative

¹⁶ The oldest notification dates back to January 2004. The PBC conducted OMOs weekly before May 2004, then adjusted the frequency to biweekly until January 2016. From 2016 to 2017, the PBC published OMO notifications daily, even for days without OMOs. Informative OMO notices started in March 2016.

Figure 14.11. 7-Day Repo Volatility, 2013–17

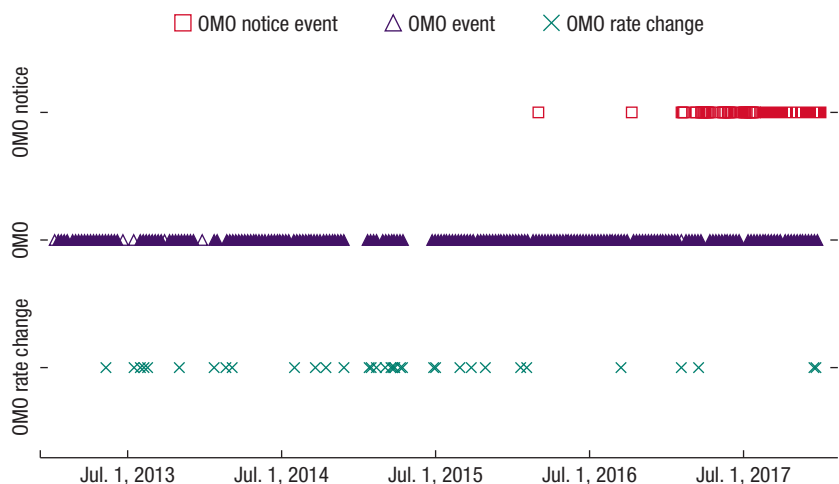
Source: Authors' calculations.

Note: $D(\text{speech_zhou})$ = dummy variable for speeches by the People's Bank of China governor Xiaochuan Zhou; repo = repurchase.

Figure 14.12. Treasury 3-Year Volatility, 2013–17

Source: Authors' calculations.

Note: $D(\text{speech_zhou})$ = dummy variable for speeches by the People's Bank of China governor Xiaochuan Zhou.

Figure 14.13. Market Interventions by the People's Bank of China, 2013–17

Source: People's Bank of China.

Note: OMO = open market operations.

OMO notices, compared to the standard ones, are seen as “small notes” passed from the PBC to the market, and are identified as a format of the PBC’s communication. The dummy $D(OMO\ Notice)$ takes the value of 1 when the PBC publishes an informative notice, including brief rationales for the PBC’s OMO decision. Otherwise the value is 0. There were 98 informative notices in the sample. The first two were in March 2016 and the next in October 2016; they started regularly in February 2017. Many of the notices (68) are issued on days when the PBC does not conduct an OMO action and the notice explains the reasons for the lack of action.

The last type of market intervention by the PBC examined are changes to the OMO interest rate. The dummy $D(OMO\ Rate\ Change)$ is defined as equal to 1 if the PBC changed any rates of the repo, reverse repo, and the PBC bill at any tenor. This differs from $D(Rate\ Change)$ used previously, which documents, in addition to changes in OMO rates, changes in benchmark interest rates, the required reserve ratio, and the other instrument rates such as the short-term liquidity facility, medium-term lending facility, and so on. In the sample, there were 37 trading days on which the PBC changed an OMO rate. All were associated with OMO actions on the same day, while only two occurred with OMO informative notices.

The PBC OMO notices allow us to study the effect of their communication on monetary policy transmission efficiency. Efficient OMO transmission would ensure that interest rates in the market moved relatively in step with the rates engineered by the central bank through market operations. To investigate this, the co-movement of market interest rates (Δr_t^{mkt}) is explored with OMO interest

rates and the analysis examines how this differs during the period when the PBC was issuing informative notices. The dummy $D(\text{Notice Era})$ is defined, which is 1 during the period after which the PBC was regularly issuing these informative notices, that is, February 2017. The reason to focus on the period of regular notices is that once the market comes to expect and understands such communication, a trading day without a note is informative. The specification used is the following:

$$\Delta r_t^{\text{mkt}} = \alpha_1 + \alpha_2 D(\text{Notice Era})_t + \beta_1 \Delta r_t^{\text{OMO}} + \beta_2 D(\text{Notice Era})_t \times \Delta r_t^{\text{OMO}} + \varepsilon_t \quad (14.5)$$

Without the interaction term, the estimated coefficient β_1 indicates that if the OMO rates increase by 1 percentage point (all rates are represented in percentage points), the money market rates will increase by β_1 percentage points; stronger transmission of OMO rates would be captured by larger reaction of market rates, although values over 1 would indicate an overreaction. The estimated coefficient β_2 , on the interaction term, captures the marginal change in this relationship in the era of the PBC issuing informative notices. A positive and statistically significant β_2 coefficient indicates that the PBC's communication from the informative OMO notice has strengthened the transmission efficiency from the OMO rate to the market rate.

The results are presented in Annex Table 14.1.7. The era of issuing informative notices has been associated with a stronger transmission of OMO rates to other market rates. Not unexpectedly, given that the focus is on a 7-day reverse repo interest rate as the OMO rate, the results are strongest at the short end of the yield curve. Nonetheless, there has been a stronger co-movement, even with 1-year Shibor rates, since the OMO notices have been issued.

A first concern is that the informative notice era coincides with the period following the liberalization. The overlap is not perfect; the PBC officially liberalized interest rates in October 2015, whereas the informative notices only became regular in February 2017. Two alternative approaches are considered. First, the correlation on the days on which an informative notice is issued, $D(\text{Notice Era})$, is replaced with $D(\text{OMO Notice})$ in equation (14.5).¹⁷ The results, not reported here for the sake of brevity, are similar. A second approach is to estimate the regression in equation (14.5) but limiting the sample to the period after October 2015.

Another concern might be that rather than strengthen the transmission, the notices have simply sped up the pass-through from OMO interest rates to other market interest rates. The regression analysis discussed previously only considers the contemporaneous correlation between market and OMO interest rates. To explore the dynamic effects, one can allow for lags of OMO interest rates to drive market interest rates. To limit the number of interactions, one needs to estimate

¹⁷ The alternative equation is the following:

$$\Delta r_t^{\text{mkt}} = \alpha_1 + \alpha_2 D(\text{OMO Notice})_t + \beta_1 \Delta r_t^{\text{OMO}} + \beta_2 D(\text{OMO Notice})_t \times \Delta r_t^{\text{OMO}} + \varepsilon_t$$

the following specification, estimated separately for the era before and after informative notices were regularly issued:

$$\Delta r_t^{mkt} = \alpha_1 + \sum_{j=0}^T \beta_j \Delta r_{t-j}^{OMO} + \varepsilon_t \quad (14.6)$$

Annex Table 14.1.8 presents the relevant estimation results. They suggest that the transmission in the change of the rate is not simply about faster transmission; instead, the transparency from using informative OMO notices appears to have strengthened the transmission channel from PBC intervention to the market. The analysis indicates that understanding the rationale behind the PBC's change in the OMO rate, or reason for not intervening in markets, tends to help the market understand the policy better and reduces the noise.

POLICY RECOMMENDATIONS

The empirical analysis suggests that while the PBC has made a number of important improvements to its communication, the timing for further strengthening communication and undertaking associated institutional changes is propitious.

Institutional changes take time and require resources and political capital. But as China develops its financial system, particularly market-based financing, the need for transparent, clear, timely, and comprehensive communication will continue to increase. Failure to address existing institutional shortcomings may limit the benefits of liberalization and slow economic development.

While larger institutional changes will take time, practical actions could improve communication in advance. In fact, these suggestions are better if implemented *in advance of or at least in tandem with* greater operational independence. For example, the Bank of England first published its Inflation Report in February 1993 when it did not have control over UK monetary policy. When it became operationally independent in June 1997, the central bank's thinking and analytical tools were already well understood by the market. Lack of independence should hence not be viewed as a reason not to press ahead. As a matter of fact, certain "low-hanging fruit" could be implemented quickly:

- *Making information available in a timely fashion, in one place, and in English:* This would go a long way and would also be consistent with the intention to make capital markets more attractive, as well as with China's renminbi internationalization strategy, and its participation in global forums.¹⁸
- *Expanding the PBC's economic forecasting capacity and publishing forecasts regularly, as well as making information available about the associated framework and models:* This would reduce surprises, making monetary policy more predictable. While the PBC's Research Bureau released economic

¹⁸ In January 2019, the PBC launched a new English webpage. See <http://www.pbc.gov.cn/en/3688006/index.html>.

forecasts in 2015 and 2016, each with a mid-year update, these were discontinued in 2017. Of course, strengthening forecasting would require appropriate resources and expertise; here the PBC could tap into the experience of modern central banks, as well as technical collaboration with the International Monetary Fund.

- *Holding regular press conferences:* A regular communication mechanism could reduce information asymmetry between the central bank and the market and allow markets to better interpret decisions and hence reduce uncertainty. As with forecasting, it is useful to begin these efforts even in advance of greater operational independence. Such a process will help the PBC learn how to communicate with the market directly and to build credibility that will serve it well, if it is—as is warranted—to become operationally more independent.¹⁹

CONCLUSIONS

Central banks are increasingly using communication as a lever of monetary policy and are often at the forefront of communication. The same is true for the PBC, which has taken important steps to improve communication. Given China's global footprint and stated policies to further liberalize its financial system and continue moving toward price-based monetary policy, further improvements in communication will be critical.

This chapter assesses the impact of the PBC's communication on financial markets using four types of communication: the quarterly published MPER, the quarterly released Minutes of the Monetary Policy Committee Meeting, press conferences and speeches by governors and deputy governors, and a novel channel, including informative OMO notices. The daily absolute change of several market interest rates in the money and bond markets, as well as equity market prices, are calculated to represent market reaction. They are regressed on PBC communication and control variables to estimate whether PBC communication affects market reaction and volatility.

The empirical analysis highlights that communication can have important benefits and that greater central bank transparency and independence would help further improve the PBC's effectiveness, including through forward guidance. The introduction of OMO information notices, for example, reduced volatility and improved monetary policy effectiveness. While some institutional changes are likely to take time, some low-hanging fruit could be adopted in the short term. For example, providing timely information in one place (in Chinese and English), expanding PBC forecasting resources and capacity, and holding regular press conferences would not only be helpful for monetary policy, but also increase the attractiveness of China's capital markets and advance renminbi internationalization.

¹⁹ See IMF (2018).

In 2018, the PBC reiterated its commitment to further strengthen communication and transparency and has already taken additional steps, including through more press conferences and interviews, deeper analysis, and more informative MPERs to guide market expectations. In addition, at the end of 2018, the central bank set up a new working group to translate policy statements and news releases into English to better provide information to international investors (Bloomberg 2018).

ANNEX 14.1. STATISTICAL TABLES

ANNEX TABLE 14.1.1.

Statistics Summary for Communication and Control Variables		
Dummy Variable	Mean	Standard Deviation
<i>D(CEWC)</i>	0.001	0.001
<i>D(MPER)</i>	0.015	0.015
<i>D(Minutes)</i>	0.015	0.015
<i>D(OMO Notice)</i>	0.038	0.038
<i>D(Macro Release)</i>	0.088	0.088
<i>D(Rate Change)</i>	0.116	0.116
<i>D(Oral – PBC Governor)</i>	0.015	0.015
<i>D(Oral Communication)</i>	0.059	0.059
<i>D(PBC Communication)</i>	0.119	0.119
<i>D(Oral – Other)</i>	0.044	0.044

Source: Authors' calculation.

Note: CEWC = Central Economic Work Conference; MPER = Monetary Policy Executive Report; OMO = open market operations; PBC = People's Bank of China.

ANNEX TABLE 14.1.2.

Statistics Summary for Market Rates				
Variable	Communication=0		Communication=1	
	Mean	Standard Deviation	Mean	Standard Deviation
R007	2.641	2.641	3.046	3.046
DR007	2.722	2.722	2.746	2.746
Shibor (1d)	2.353	2.353	2.460	2.460
Shibor (1w)	2.925	2.925	2.908	2.908
MTN (1y)	4.064	4.064	4.164	4.164
MTN (3m)	4.138	4.138	4.080	4.080
MTN (6m)	4.206	4.206	4.153	4.153
ST CP (1m)	4.016	4.016	3.935	3.935
ST CP (3m)	3.860	3.860	3.980	3.980
ST CP (6m)	3.954	3.954	4.063	4.063
Treasury (1y)	2.635	2.635	2.919	2.919
Treasury (5y)	3.228	3.228	3.346	3.346
Treasury (10y)	3.567	3.567	3.559	3.559
SSE Return	0.013	0.013	0.096	0.096

Source: Authors' calculations.

Note: DR007 = 7-day interbank pledged repo rate; MTN = medium-term note; R007 = 7-day repo rate for nonfinancial institutions; Shibor = Shanghai interbank offered rate; SSE = sum of squared errors; ST CP = short-term commercial paper; 1d = 1 day; 1w = 1 week; 1m = 1 month; 3m = 3 month; 6m = 6 month; 5y = 5 year; 10y = 10 year.

ANNEX TABLE 14.1.3.

Ordinary Least Squares Estimates for Aggregated Communication									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	D.Repo (7d)–DR007	D.Shibor 1w	D.ST CP (1m)	D.ST CP (3m)	D.ST CP (6m)	D.MTN (1y)	D.Treasury (3y)	D.Treasury (5y)	D.SSE Return
<i>D(CEWC)</i>	–0.018 [0.338]	–0.062** [0.011]	0.053 [0.340]	0.069* [0.089]	0.052** [0.044]	0.033 [0.128]	0.0092 [0.280]	–0.0093*** [0.004]	–0.35* [0.082]
<i>D(Macro Release)</i>	–0.011* [0.076]	–0.026* [0.051]	–0.014 [0.131]	0.0014 [0.734]	0.00060 [0.863]	0.0015 [0.724]	–0.00046 [0.754]	0.0016 [0.310]	0.17 [0.224]
<i>D(Rate Change)</i>	0.088** [0.014]	0.13** [0.011]	0.035* [0.095]	0.021** [0.039]	0.0100 [0.110]	0.0074 [0.221]	0.00042 [0.837]	0.0010 [0.667]	0.83*** [0.001]
<i>D(PBC Communication)</i>	0.0026 [0.682]	–0.058*** [0.000]	–0.020** [0.023]	–0.0011 [0.797]	–0.0033 [0.261]	0.00069 [0.814]	–0.00011 [0.931]	0.00088 [0.494]	–0.15 [0.147]
Constant	0.055*** [0.000]	0.11*** [0.000]	0.079*** [0.000]	0.044*** [0.000]	0.039*** [0.000]	0.036*** [0.000]	0.021*** [0.000]	0.021*** [0.000]	1.32*** [0.000]
<i>R</i> ²	0.063	0.031	0.004	0.007	0.006	0.003	0.001	0.002	0.019

Source: Authors' calculations.

Note: CEWC = Central Economic Work Conference; DR007 = 7-day interbank pledged repo rate; MTN = medium-term note; PBC = People's Bank of China; Shibor = Shanghai interbank offered rate; SSE = sum of squared errors; ST CP = short-term commercial paper; 1m = 1 month; 1w = 1 week; 3m = 3 month; 6m = 6 month; 3y = 3 year; 5y = 5 year; 7d = 7 day. The *p* values appear in brackets.

p* < .1; *p* < .05; ****p* < .01.

ANNEX TABLE 14.1.4.

Ordinary Least Squares Estimates for Communication, by Category									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	[D.Repo (7d)–DR007]	[D.Shibor (1w)]	[D.ST CP(1m)]	[D.ST CP(3m)]	[D.ST CP(6m)]	[D.MTN(1y)]	[D.Treasury(3y)]	[D.Treasury (5y)]	[D.SSE Return]
<i>D(CEWC)</i>	–0.017 [0.348]	–0.061** [0.014]	0.054 [0.330]	0.069* [0.089]	0.052** [0.043]	0.033 [0.126]	0.0089 [0.293]	–0.0094*** [0.003]	–0.40** [0.048]
<i>D(Macro Release)</i>	–0.011* [0.073]	–0.027** [0.045]	–0.014 [0.126]	0.0015 [0.721]	0.00084 [0.810]	0.0016 [0.708]	–0.00032 [0.828]	0.0017 [0.282]	0.19 [0.176]
<i>D(Rate Change)</i>	0.089** [0.015]	0.13** [0.011]	0.036* [0.092]	0.021** [0.050]	0.011* [0.087]	0.0073 [0.242]	0.00013 [0.949]	0.00098 [0.688]	0.77*** [0.002]
<i>D(MPER)</i>	–0.0096 [0.492]	–0.012 [0.637]	–0.030*** [0.000]	–0.011* [0.057]	–0.011 [0.123]	–0.0068 [0.369]	–0.0023 [0.535]	0.0037 [0.362]	–0.26 [0.191]
<i>D(Minutes)</i>	0.028 [0.184]	0.15* [0.083]	0.032 [0.421]	0.0096 [0.653]	–0.0019 [0.766]	0.013 [0.590]	–0.0021 [0.456]	–0.0082** [0.017]	0.29 [0.406]
<i>D(OMO Notice)</i>	0.015* [0.065]	–0.088*** [0.000]	–0.0098 [0.334]	–0.00078 [0.863]	0.00012 [0.975]	–0.00074 [0.821]	–0.0024 [0.160]	–0.00062 [0.707]	–0.74*** [0.000]
<i>D(Oral – Zhou)</i>	–0.023*** [0.006]	–0.023 [0.263]	–0.0074 [0.577]	–0.00088 [0.911]	0.011 [0.206]	0.0066 [0.423]	0.0022 [0.583]	0.0036 [0.401]	0.19 [0.456]
<i>D(Oral – Other)</i>	–0.0029 [0.744]	–0.061*** [0.000]	–0.019* [0.053]	0.0029 [0.637]	–0.0051 [0.174]	0.0023 [0.544]	0.0017 [0.332]	0.0013 [0.426]	0.13 [0.375]
Constant	0.055*** [0.000]	0.10*** [0.000]	0.078*** [0.000]	0.044*** [0.000]	0.039*** [0.000]	0.035*** [0.000]	0.021*** [0.000]	0.021*** [0.000]	1.31*** [0.000]
<i>R</i> ²	0.071	0.041	0.004	0.008	0.008	0.005	0.003	0.007	0.036

Source: Authors' calculations.

Note: CEWC = Central Economic Work Conference; DR007 = 7-day interbank pledged repo rate; MTN = medium-term note; MPER = Monetary Policy Executive Report; R007 = 7-day repo rate for nonfinancial institutions; OMO = open market operations; PBC = People's Bank of China; Shibor = Shanghai interbank offered rate; SSE = sum of squared errors; ST CP = Short-term commercial paper; 1m = 1 month; 1w = 1 week; 3m = 3 month; 6m = 6 month; 3y = 3 year; 5y = 5 year. The *p*-values appear in brackets.

p* < .1; *p* < .05; ****p* < .01.

ANNEX TABLE 14.1.5.

EGARCH Results of Aggregated Communication					
	D.R007 (1)	D.ST CP(3m) (2)	D.MTN(1y) (3)	D.Treasury(3y) (4)	SSE Return (5)
Conditional Mean					
Dependent Variable					
($t-1$)	0.14*** (0.000)	0.18*** (0.000)	0.13*** (0.000)	0.07*** (0.023)	0.02 (0.447)
D.Reverse Repo Rate	0.38*** (0.024)	-0.00 (0.971)	0.02 (0.772)	-0.02 (0.490)	0.36 (0.873)
Constant	0.01*** (0.000)	0.00 (0.492)	-0.00 (0.305)	0.00 (0.969)	0.03 (0.274)
Conditional Volatility					
<i>D(CEWC)</i>	2.44*** (0.000)	-0.43 (0.422)	-0.26 (0.603)	-0.87 (0.146)	0.46*** (0.009)
<i>D(Macro Release)</i>	-0.43*** (0.000)	0.11* (0.076)	0.04 (0.432)	-0.06 (0.406)	-0.02 (0.514)
<i>D(Rate Change)</i>	0.06 (0.302)	0.28*** (0.000)	0.04 (0.461)	0.03 (0.743)	0.03 (0.580)
<i>D(PBC Communication)</i>	0.08*** (0.000)	-0.01 (0.873)	-0.01 (0.812)	-0.00 (0.949)	-0.03 (0.251)
Constant	-0.08*** (0.000)	-0.36*** (0.000)	-0.35*** (0.000)	-0.74*** (0.000)	0.02* (0.070)
ARCH					
L.earch	0.25*** (0.000)	0.17*** (0.000)	0.08*** (0.000)	0.11*** (0.000)	0.01 (0.384)
L.earch	0.36*** (0.000)	0.58*** (0.000)	0.30*** (0.000)	0.47*** (0.000)	0.20*** (0.000)
L.egarch	0.96*** (0.000)	0.93*** (0.000)	0.94*** (0.000)	0.90*** (0.000)	1.00*** (0.000)
No. of observations	1246	1246	1246	1246	1159

Source: Authors' calculations.

Note: The table tests the volatility effects of communication using an EGARCH methodology, a particular class of General Autoregressive Conditional Heteroscedastic (GARCH) model, following Nelson (1991) (see glossary). CEWC = Central Economic Work Conference; R007 = 7-day repo rate for nonfinancial institutions; PBC = People's Bank of China; SSE = sum of squared errors; ST CP = short-term commercial paper. The p -values appear in parentheses.

* $p < .1$; ** $p < .05$; *** $p < .01$.

ANNEX TABLE 14.1.6.

EGARCH Results of Aggregated Communication, by Category and People					
	D.R007	D.ST CP (3m)	D.MTN (1y)	D.Treasury (3y)	SSE Return
	(1)	(2)	(3)	(4)	(5)
Conditional Mean					
Dependent Variable ($t-1$)	0.14*** (0.000)	0.13*** (0.000)	0.14*** (0.000)	0.07*** (0.023)	0.03 (0.431)
D.Reverse Repo Rate	0.36** (0.039)	0.00 (0.983)	0.02 (0.798)	-0.02 (0.512)	0.33 (0.882)
Constant	0.01*** (0.000)	0.00 (0.225)	-0.00 (0.209)	0.00 (0.992)	0.03 (0.245)
Conditional Volatility					
<i>D(CEWC)</i>	2.40*** (0.000)	-0.54 (0.354)	-0.13 (0.834)	-0.93 (0.130)	0.37* (0.055)
<i>D(Macro Release)</i>	-0.43*** (0.000)	0.06 (0.414)	0.06 (0.342)	-0.07 (0.342)	-0.03 (0.485)
<i>D(Rate Change)</i>	0.06 (0.271)	0.45*** (0.000)	0.13* (0.057)	0.02 (0.858)	0.03 (0.542)
<i>D(PBC Communication)</i>	0.06*** (0.009)	0.09** (0.026)	-0.03 (0.405)	0.02 (0.745)	-0.02 (0.450)
<i>D(Oral – PBCGOV)</i>	0.17* (0.095)	-0.15 (0.343)	0.74*** (0.000)	-0.24 (0.172)	-0.16** (0.026)
<i>D(MPER)</i>	-0.19 (0.251)	0.33** (0.028)	0.16 (0.345)	-0.07 (0.751)	-0.12 (0.359)
Constant	-0.07*** (0.000)	-0.88*** (0.000)	-0.56*** (0.000)	-0.73*** (0.000)	0.02** (0.033)
ARCH					
L.earch	0.24*** (0.000)	0.19*** (0.000)	0.09*** (0.000)	0.11*** (0.000)	0.01 (0.424)
L.earch	0.36*** (0.000)	0.77*** (0.000)	0.37*** (0.000)	0.47*** (0.000)	0.20*** (0.000)
L.egarch	0.96*** (0.000)	0.84*** (0.000)	0.91*** (0.000)	0.90*** (0.000)	1.00*** (0.000)
No. of observations	1,246	1,246	1,246	1,246	1,159

Source: Authors' calculations.

Note: The table tests the volatility effects of communication using an EGARCH methodology, a particular class of General Autoregressive Conditional Heteroscedastic (GARCH) model, following Nelson (1991) (see glossary). CEWC = Central Economic Work Conference; R007 = 7-day repo rate for nonfinancial institutions; MPER = Monetary Policy Executive Report; MTN = medium-term note; PBC = People's Bank of China; repo = repurchase; SSE = sum of squared errors; ST CP = short-term commercial paper. The p -values appear in parentheses.

* $p < .1$; ** $p < .05$; *** $p < .01$.

ANNEX TABLE 14.1.7.

Open Market Operations (OMO) Notice and Transmission Efficiency												
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	D.R001	D.R007	D.DR007	D.R014	D.Shibor (1d)	D.Shibor (1w)	D.Shibor (2w)	D.Shibor (1m)	D.Shibor (3m)	D.Shibor (6m)	D.Shibor (9m)	D.Shibor (1y)
D. Reverse Repo Rate	-0.063 [0.179]	-0.0097 [0.897]	-0.0038 [0.962]	-0.11 [0.130]	-0.045* [0.091]	0.027 [0.772]	-0.15*** [0.008]	-0.12*** [0.002]	-0.0069 [0.582]	0.0037 [0.292]	0.0019 [0.512]	0.0021 [0.455]
Notice Era	0.0071 [0.573]	0.0089 [0.714]	0.0034 [0.659]	0.017 [0.456]	0.0038 [0.730]	0.0023 [0.792]	0.0050 [0.557]	0.0053 [0.414]	0.0042** [0.011]	0.0044*** [0.000]	0.0045*** [0.000]	0.0047*** [0.000]
D. Reverse Repo Rate × Notice Era	1.09*** [0.001]	6.12** [0.011]	1.36** [0.040]	0.84*** [0.003]	0.51*** [0.000]	0.33*** [0.001]	0.38*** [0.000]	0.74*** [0.000]	0.27*** [0.000]	0.30*** [0.000]	0.20*** [0.000]	0.19*** [0.000]
Constant	-0.0017 [0.860]	-0.0010 [0.913]	-0.0020 [0.678]	-0.00023 [0.981]	-0.0014 [0.895]	-0.0012 [0.888]	-0.0011 [0.895]	-0.0011 [0.861]	-0.0000023 [0.999]	-0.00023 [0.634]	-0.00049 [0.245]	-0.00061 [0.115]
R ²	0.000	0.004	0.003	0.001	0.000	0.000	0.001	0.001	0.003	0.019	0.023	0.029
Quantile	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS

Source: Authors' calculations.

Note: DR007 = 7-day interbank pledged repo rate; OLS = ordinary least squares; R001 = 1-day repo rate for nonfinancial institutions; R007 = 7-day repo rate for nonfinancial institutions; R014 = 14-day repo rate for nonfinancial institutions; Shibor = Shanghai interbank offered rate: 1d = 1 day; 1w = 1 week; 2w = 2 week; 1m = 1 month; 3m = 3 month; 6m = 6 month; 9m = 9 month; 1y = 1 year. The *p*-values appear in brackets.

p* < 0.1; *p* < 0.05; ****p* < 0.01.

ANNEX TABLE 14.1.8.

Open Market Operations Notice and Transmission Efficiency: Dynamic Results												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Variables	D.R001	D.R001	D.R007	D.R007	D.DR007	D.DR007	D.R014	D.R014	D.Shibor (1d)	D.Shibor (1d)	D.Shibor (1w)	D.Shibor (1w)
Notice Era	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
D. Reverse Repo Rate	-0.058 [0.245]	1.07*** [0.001]	-0.0016 [0.984]	6.18** [0.011]	-0.026 [0.732]	1.37** [0.039]	-0.084 [0.296]	0.83*** [0.005]	-0.038 [0.199]	0.48*** [0.000]	0.031 [0.744]	0.36*** [0.000]
L. D. Reverse Repo Rate	0.11 [0.181]	1.13 [0.240]	0.12 [0.351]	-2.10*** [0.000]	0.024 [0.860]	0.52 [0.471]	0.12** [0.033]	0.53 [0.436]	0.12 [0.191]	0.84 [0.158]	0.088 [0.371]	0.12 [0.298]
L2. D. Reverse Repo Rate	-0.17** [0.043]	0.67*** [0.000]	-0.16 [0.463]	2.10*** [0.004]	0.26*** [0.007]	-0.28* [0.061]	0.026 [0.870]	0.70*** [0.008]	-0.14* [0.065]	0.074 [0.350]	-0.24 [0.105]	-0.00019 [0.999]
L3. D. Reverse Repo Rate	-0.081 [0.633]	1.65 [0.188]	-0.12 [0.222]	5.40 [0.122]	0.12** [0.035]	0.67 [0.259]	-0.33 [0.216]	6.18*** [0.000]	-0.096 [0.481]	0.11* [0.086]	-0.061 [0.633]	0.089 [0.188]
Constant	-0.0018 [0.849]	0.0016 [0.845]	-0.0012 [0.899]	0.0019 [0.933]	-0.00064 [0.895]	0.00047 [0.941]	-0.00041 [0.966]	0.0081 [0.690]	-0.0015 [0.887]	0.0013 [0.696]	-0.0014 [0.868]	0.00086 [0.466]
R ²	0.001	0.031	0.001	0.050	0.008	0.020	0.003	0.042	0.001	0.033	0.002	0.030

ANNEX TABLE 14.1.8. (continued)

Open Market Operations Notice and Transmission Efficiency: Dynamic Results												
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Variable	D.Shibor (2w)	D.Shibor (2w)	D.Shibor (1m)	D.Shibor (1m)	D.Shibor (3m)	D.Shibor (3m)	D.Shibor (6m)	D.Shibor (6m)	D.Shibor (9m)	D.Shibor (9m)	D.Shibor (1y)	D.Shibor (1y)
Notice Era	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
D. Reverse Repo Rate	-0.13* [0.065]	0.24*** [0.000]	-0.12*** [0.004]	0.63*** [0.000]	-0.0072 [0.561]	0.27*** [0.000]	0.0036 [0.302]	0.31*** [0.000]	0.0020 [0.500]	0.21*** [0.000]	0.0022 [0.450]	0.20*** [0.000]
L. D. Reverse Repo Rate	0.11** [0.012]	-0.045 [0.763]	-0.33** [0.013]	0.34** [0.012]	-0.0053 [0.540]	0.15*** [0.000]	0.0013 [0.438]	0.24*** [0.000]	-0.000027 [0.983]	0.26*** [0.000]	0.00062 [0.528]	0.23*** [0.000]
L2. D. Reverse Repo Rate	-0.12 [0.268]	0.19*** [0.004]	-0.30** [0.036]	0.32** [0.018]	0.013 [0.235]	0.16*** [0.000]	0.0059 [0.268]	0.12*** [0.000]	0.0044 [0.392]	0.21*** [0.005]	0.0026 [0.263]	0.18*** [0.003]
L3. D. Reverse Repo Rate	-0.32 [0.320]	0.20** [0.027]	-0.079 [0.342]	0.37*** [0.000]	0.0055 [0.449]	0.32* [0.064]	0.0018 [0.221]	0.12*** [0.002]	-0.0013 [0.621]	0.16*** [0.004]	-0.00057 [0.525]	0.14*** [0.010]
Constant	-0.0014 [0.864]	0.0035*** [0.000]	-0.0019 [0.767]	0.0031* [0.085]	0.000016 [0.990]	0.0035*** [0.001]	-0.00022 [0.649]	0.0037*** [0.000]	-0.00049 [0.249]	0.0033*** [0.000]	-0.00061 [0.118]	0.0035*** [0.000]
R ²	0.004	0.063	0.010	0.075	0.000	0.069	0.000	0.140	0.000	0.330	0.000	0.256

Source: Authors' calculations.

Note: DR007 = 7-day interbank pledged repo rate; OLS = ordinary least squares; R001 = 1-day repo rate for nonfinancial institutions; R007 = 7-day repo rate for nonfinancial institutions; R014 = 14-day repo rate for nonfinancial institutions; Shibor = Shanghai interbank offered rate: 1d = 1 day; 1w = 1 week; 2w = 2 week; 1m = 1 month; 3m = 3 month; 6m = 6 month; 9m = 9 month; 1y = 1 year. The *p*-values appear in brackets.

p* < .1; *p* < .05; ****p* < .01.

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PART IV

Offshore Bond Market

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Offshore Renminbi Dim Sum Bonds

Kevin Chow and Daniel Law

The market for dim sum bonds (bonds issued outside of China and denominated in Chinese renminbi) in Hong Kong SAR has expanded since 2011, underpinned by policies promoting external use of the renminbi and liberalization of two-way renminbi fund flows between onshore and offshore markets, before peaking in 2015.

Key driving forces for the attractiveness of the market include the need from foreign companies for offshore renminbi funds to support businesses in the onshore market and from mainland firms for external financing to support outward direct investment (ODI) conducted through Hong Kong SAR. The role of the dim sum bond market as an alternative renminbi fundraising platform for international and mainland issuers helps promote external use of the currency by global firms and investors attracted by its high accessibility. Indeed, the market has played an important role in price discovery and intermediating renminbi funds between onshore and offshore markets.¹

Accordingly, policymakers must understand the major factors driving the dim sum bond market to formulate appropriate policy to foster the development of the offshore renminbi bond market. In this spirit, this chapter reviews the structure of the dim sum bond market, including its issuer profile and key features of dim sum bonds. It identifies factors driving issuance, and suggests that economic growth, offshore-onshore yield differentials, the use of the renminbi funds raised, the effective and forward exchange rate of renminbi, and mainland policy factors are key determinants of net issuance of dim sum bonds in the offshore market.

STRUCTURE OF THE DIM SUM BOND MARKET

The dim sum bond market has grown quickly since the China Development Bank issued the first offshore RMB bond in Hong Kong SAR in 2007.² In October 2009, China's Ministry of Finance issued RMB 6 billion of Treasury

¹ For a detailed discussion of the role of the offshore market and its relationship with the external use of a currency, see HE and McCauley (2012).

² In July 2007, the China Development Bank issued a two-year offshore RMB bond in Hong Kong SAR, with a coupon rate of 3.0 percent and face value of RMB 5 billion.

bonds in Hong Kong SAR, marking the milestone of issuing renminbi bonds by the central government in the offshore market.³ The continuous issuance of offshore renminbi bonds by the Ministry of Finance helps establish a benchmark yield curve to facilitate pricing of renminbi bonds issued in Hong Kong SAR, the so-called dim sum bonds. Underpinned by expectations that the renminbi would appreciate, and the limited supply of renminbi-denominated assets relative to the fast growth in renminbi deposits in the offshore market, the robust demand propelled the size of the corporate dim sum bond market to increase nine-fold in five years, reaching a peak of RMB 580 billion at the end of 2015 (Figure 15.1). Compared to the size of the renminbi liquidity pool in Hong Kong SAR, the size of outstanding dim sum bonds is relatively small, equivalent to 0.9 percent of offshore renminbi deposits as of March 2018, after reaching a peak of 1.3 percent in February 2017. While gross issuance of dim sum bonds has fallen in recent years due to factors such as higher renminbi volatility and slower China's economic growth, issuance activities in dim sum bonds stabilized in early 2018, driven by the needs for external financing by mainland enterprises, and the demand for renminbi funding by foreign firms to support their business and investment in China (Figure 15.2).⁴

Given the absence of restrictions on the type of issuer in dim sum bonds and the use of renminbi funds raised by issuers, the issuer profile is diverse, ranging from multinationals to Chinese firms and to companies doing business in Hong Kong SAR. When the dim sum bond market took off in 2011, international issuers (outside China and Hong Kong SAR) accounted for 20–30 percent of gross issuance, Chinese firms took up more than half, and the rest were Hong Kong SAR companies (Figure 15.3).⁵ In 2014, the number of mainland issuers in the dim sum bond market picked up markedly, contributing substantially to more than 70 percent of gross issuance. During 2016–17, international issuers began to actively tap offshore renminbi funds through the dim sum bond market, while gross issuance by mainland firms fell, in part reflecting increased scrutiny of external borrowing by the Chinese authorities.

The industry profile of dim sum bond issuers is diverse (Figure 15.4). Nonbank financial companies and real estate developers are active issuers in the offshore renminbi bond market.⁶ To facilitate issuance of dim sum bonds, China's firms usually set up subsidiaries or special purpose vehicles to raise renminbi funds in the offshore market. This explains the relatively large share of issuance

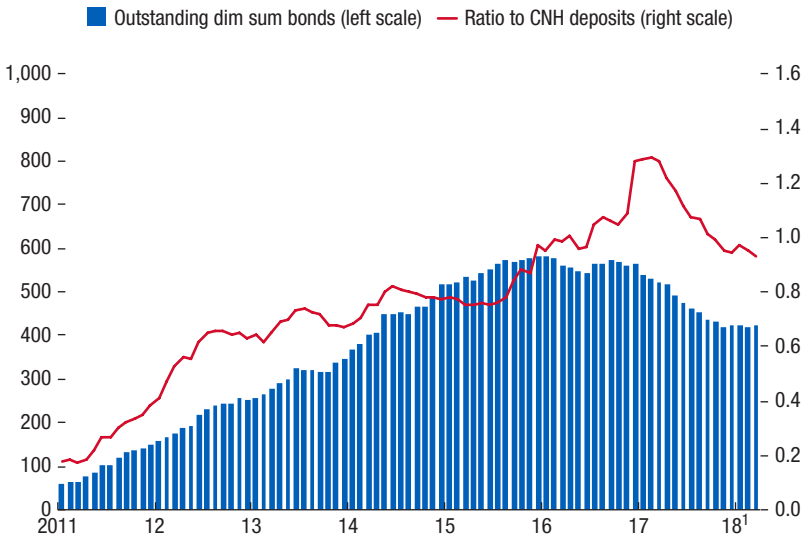
³ The inaugural issue of offshore renminbi bonds issued by the Ministry of Finance in Hong Kong SAR included tenors of two, three, and five years.

⁴ A detailed discussion of the development of the dim sum bond market can be found in Fung, Tzau, and Yau (2013).

⁵ "Issuer by nationality" is classified based on the country of risk as defined by Bloomberg, which refers to the beneficial ownership of the company in general. For example, the subsidiary of a mainland enterprise incorporated in Hong Kong SAR would be classified as a mainland firm.

⁶ Nonbank financial companies exclude international financial institutions, policy banks, banks, and insurance companies, but include securities firms.

Figure 15.1. Outstanding Dim Sum Bonds, 2011–18
(Billions of renminbi, left scale; percent, right scale)

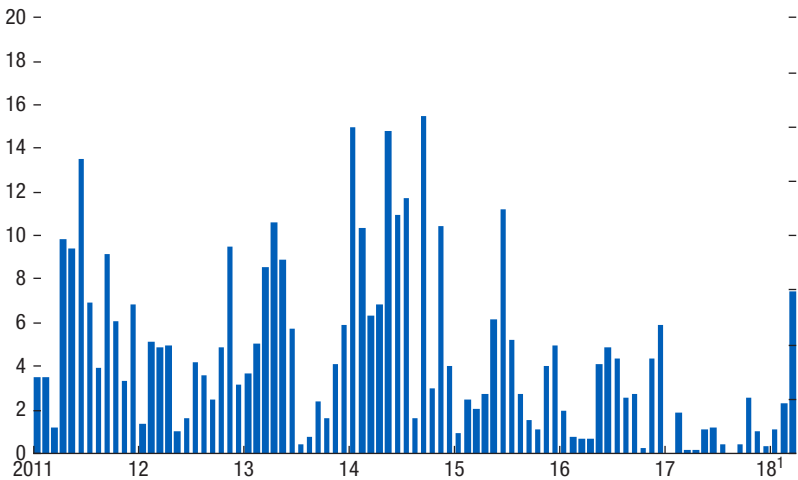


Sources: Bloomberg L.P.; CEIC data; and authors' calculations.

Note: CNH deposits refer to offshore renminbi deposits in Hong Kong SAR.

¹ Data for 2018 are through March.

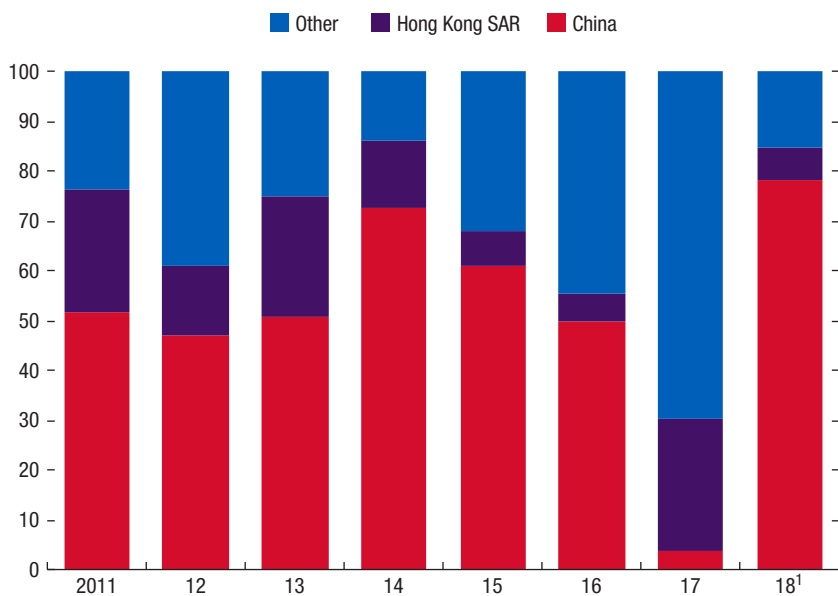
Figure 15.2. Dim Sum Bonds, Gross Issuance, 2011–18
(Billions of renminbi)



Sources: Bloomberg L.P.; and authors' calculations.

¹ Data for 2018 are through March.

Figure 15.3. Dim Sum Bond Issuers by Nationality, 2011–18
(Percent)



Sources: Bloomberg L.P.; and authors' calculations.

Note: "Issuers by nationality" is classified based on the country of risk as defined by Bloomberg.

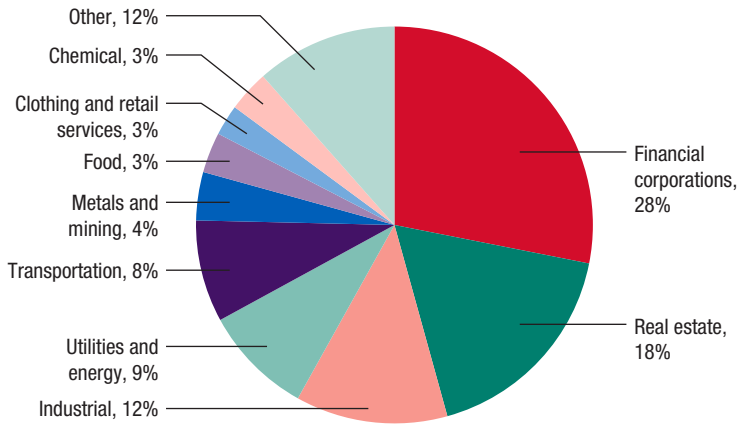
¹ Data for 2018 are through the first quarter.

by nonbank financial companies, including special purpose vehicles. The use of special purpose vehicles is common for mainland companies to invest overseas or raise funds in the offshore market given their flexibility and easy-to-establish properties, particularly for mainland companies without having to set up overseas subsidiaries.⁷

Real estate developers—from both Hong Kong SAR and the mainland—are also active dim sum bond issuers. Hong Kong SAR developers raise renminbi funds in the offshore market to finance their construction projects in the onshore market. For mainland developers, the dim sum bond market is an alternative fundraising avenue when liquidity tightens in the onshore market.

Most dim sum bond issuers raise renminbi funds to support investment projects or for working capital. Reflecting this, the tenor of most dim sum bonds is one to three years (Figure 15.5). By investor profile, both retail and institutional

⁷ To recognize the common use of special purpose vehicles by mainland companies for purposes of overseas investment and external financing, the State Administration of Foreign Exchange issued a circular in July 2014 to set out the rules and regulations on the use of overseas special purpose vehicles in overseas investment and external financing.

Figure 15.4. Industry Profile of Dim Sum Bond Issuers

Sources: Bloomberg L.P.; and authors' calculations.

Note: Issuers in "Financial corporations" include nonbank non-insurance financial institutions such as securities firms, finance companies, and special purpose vehicles. Issuers in the "other" category include other service sectors and investment holding companies with diversified business portfolios.

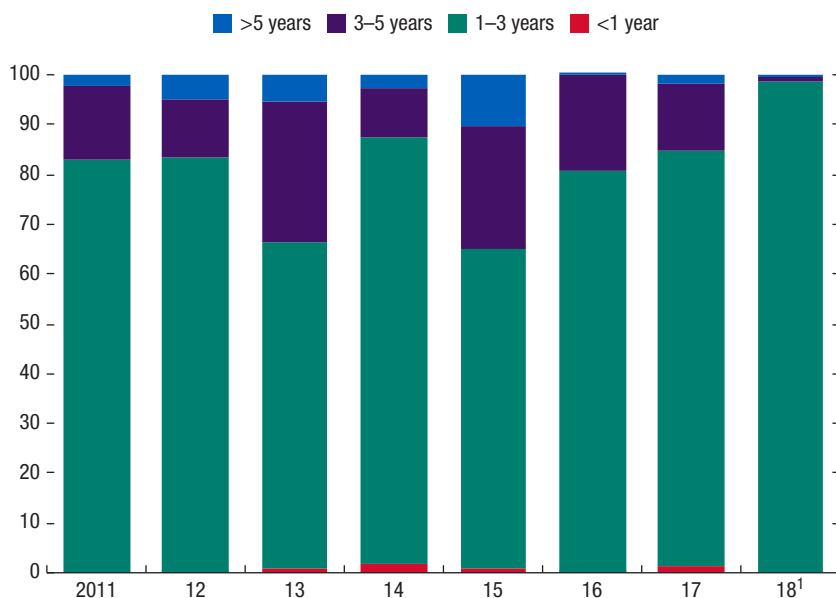
investors, such as mutual fund managers, are major buyers of dim sum bonds, given their higher yields than renminbi deposit rates in the offshore market. Based on data from the Central Moneymarkets Unit, the major custodian of renminbi bonds traded in Hong Kong SAR, no detailed information exists on ultimate investors because it is common for banks to act as trustee to hold and settle dim sum bonds on behalf of clients. For daily turnover, data from the Central Moneymarkets Unit on renminbi bonds issued by banks, corporations, and government organizations show that trading is most active in tenors of one year or less, probably because institutional investors usually hold dim sum bonds to maturity (Figure 15.6).⁸

THE DIM SUM BOND MARKET AS A PLATFORM FOR RAISING OFFSHORE RENMINBI FUNDS

When the offshore renminbi bond market took off in 2011, multinationals such as McDonald's, Unilever, and Caterpillar issued dim sum bonds to tap renminbi funds in Hong Kong SAR to support businesses in the onshore market, such as purchasing equipment or setting up production plants. Issues usually ranged from two to three years. Given strong credit standings and strong demand for renminbi

⁸ Renminbi bond turnover lodged with the Central Moneymarkets Unit includes dim sum bonds issued by the government, policy banks, supranationals, banks, and nonbank corporations.

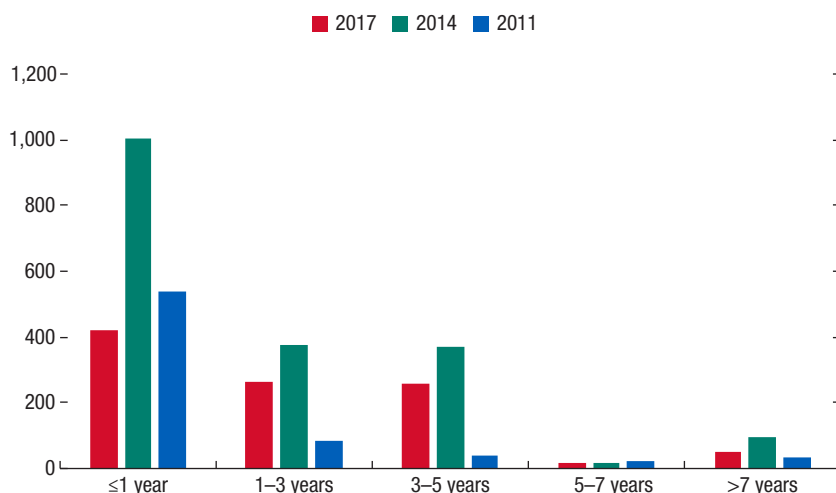
Figure 15.5. Maturity Profile of Dim Sum Bonds, 2011–18
(Percent)



Sources: Bloomberg L.P.; and authors' calculations.

¹ Data for 2018 are through the first quarter.

Figure 15.6. Average Daily Turnover of Renminbi Bonds in the Custody of the Central Moneymarkets Unit
(Millions of renminbi)



Sources: Central Moneymarkets Unit; and authors' calculations.

Note: Includes offshore renminbi bonds issued by banks, corporations, and government organizations.

TABLE 15.1.

Dim Sum Bonds Issued by Multinationals and China's Ministry of Finance, September 2010 through September 2011

Issuer	Issue Date	Amount (RMB million)	Tenor (years)	Coupon Rate (percent)	Onshore AAA Enterprise Bond Yield (3-year) (percent)	Yield Differential: Offshore Minus Onshore (basis points)
McDonald's	Sept. 16, 2010	200	3	3.00	3.32	-32
Caterpillar	Dec. 1, 2010	1,000	2	2.00	4.38	-238
Financial Services						
Ministry of Finance, China	Dec. 20, 2010	3,000	2	1.60	3.30¹	-170
Unilever	Mar. 31, 2011	300	3	1.15	4.65	-350
Caterpillar	Jul. 12, 2011	2,300	2	1.35	5.11	-376
Financial Services						
Tesco PLC	Sept. 1, 2011	725	3	1.75	5.82	-407
BP PLC	Sept. 14, 2011	700	3	1.70	5.82	-412

Sources: Bloomberg L.P.; and media reports.

Note:

¹ Yield on three-year renminbi bond issued by the Ministry of Finance in the onshore market.

assets, the coupon rates of offshore renminbi bonds issued by multinationals were generally lower than the yields of comparable AAA enterprise bonds issued in the onshore market (Table 15.1). Sovereign issuers, such as China's Ministry of Finance, also enjoyed a lower cost of bond financing in the offshore market.

Attracted by competitive pricing, a growing number of mainland companies have been tapping renminbi funds in the dim sum bond market. For state-owned enterprises, the funds raised could be used to support their direct investment overseas, such as outbound mergers and acquisitions. For privately owned enterprises, an incentive for them to issue dim sum bonds is to diversify sources of funding, particularly when liquidity becomes tight in the onshore market. For example, when onshore funding costs picked up during 2013–14, there was a broad-based increase in dim sum bond issuance by mainland companies across sectors including issuers in the mining, financial, and real estate segments (Table 15.2). Historically, there has been a relatively strong co-movement between onshore-offshore yield differentials and gross issuance of dim sum bonds in the offshore market (Figure 15.7).⁹

A host of policies and market factors underpinned the rapid expansion of the dim sum bond market in earlier years. Among these, liberalization supporting the use of renminbi in direct investment is important. In January 2011, the People's Bank of China announced a pilot scheme to allow China's mainland enterprises

⁹ Onshore-offshore yield differentials are based on the indices developed by the Bank of China and the Bank of China International (Hong Kong), which selects qualified three-year (the mainstream tenor of offshore renminbi bonds) offshore and onshore renminbi corporate bonds as constituents. The index and its sub-indices calculate the difference of weighted average yield to maturity between the onshore and offshore markets.

TABLE 15.2.

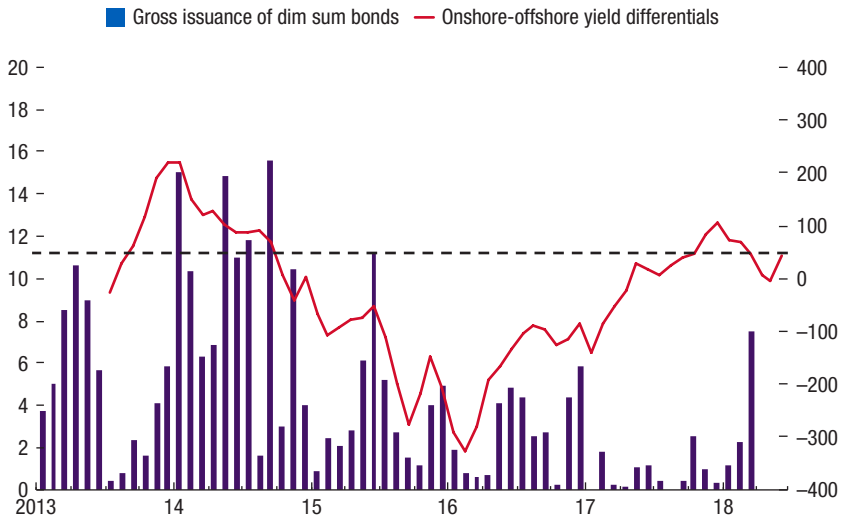
Bond Funding Cost of Mainland Issuers in Onshore versus Offshore Markets, 2010–14									
State- or Privately Owned Enterprise ¹	Issue Month and Year	Offshore markets		Yield Differential Offshore Minus Onshore (basis points)		Onshore markets			Coupon (% per annum)
		Tenor (no. of years)	Coupon (% per annum)			Issue Month and Year	Tenor (no. of years)		
CNPC Finance HK Ltd.	Oct. 2011	3	2.95	-102	Petrochina Co. Ltd.	May 2010	5		3.97
Shanghai Baosteel Group	Feb. 2012	3	3.675	-144	Shanghai Meishan Iron & Steel	Apr. 2012	3		5.11
Huaneng Power Intl Inc.	Feb. 2013	3	3.85	-130	China Huaneng Group	Mar. 2013	5		5.15
Vanke	Apr. 2013	5	4.5	-20	Vanke	Dec. 2014	3		4.7
Yunnan Energy Investment	Oct. 2014	3	5.5	-65	Yunnan Provincial Energy	Oct. 2014	3		6.15

Sources: Bank of China; and Bank of China International (HK) Ltd.

¹ Some dim sum bond issuers in Hong Kong SAR are subsidiaries of their mainland parent companies.

Figure 15.7. Onshore-Offshore Yield Differentials and Gross Issuance of Dim Sum Bonds, 2013 through March 2018

(Billions of renminbi, left scale; basis points, right scale)



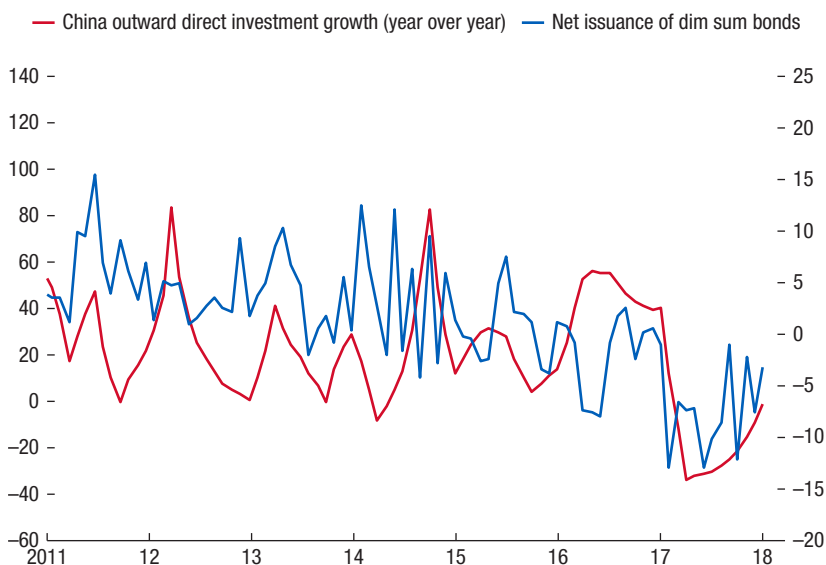
Sources: Bank of China; and Bloomberg L.P.

to use renminbi in conducting ODI, as noted in the introduction. In October 2011, the Ministry of Commerce and the People's Bank of China issued separate circulars to allow foreign investors to use offshore renminbi funds to finance foreign direct investment (FDI) in China, including renminbi funds raised in the offshore bond market. These liberalization measures have boosted issuance of dim sum bonds by foreign companies and mainland firms in the offshore market. Details on the liberalizing measures are listed in Annex Table 15.1.1 in Annex 15.1.

The large swing in yield differentials reflected segmentation between onshore and offshore markets with different demand and supply conditions, while room for risk-free arbitrage is limited given that capital controls are still in place in China. Differences in market liquidity and monetary conditions also contribute to differences in onshore and offshore bond yields. For example, the A-share market rout in mid-2015 boosted the safe-haven demand for bonds and raised the prospect of monetary easing by the People's Bank of China. Strong demand suppressed corporate bond yields to unusually low levels with credit spreads narrowing to historical lows, which largely explained the swing in onshore-offshore yield differentials from positive in 2013–14 to negative in 2015–16 (see Figure 15.7). Since 2017, stricter oversight of shadow banking and increased numbers of bond defaults have widened the risk premium in bond pricing, pushing up onshore bond yields relative to their offshore counterparts.

Figure 15.8. China's Outward Direct Investment and Net Issuance of Dim Sum Bonds, 2011–17

(Percent, left scale; billions of renminbi, right scale)



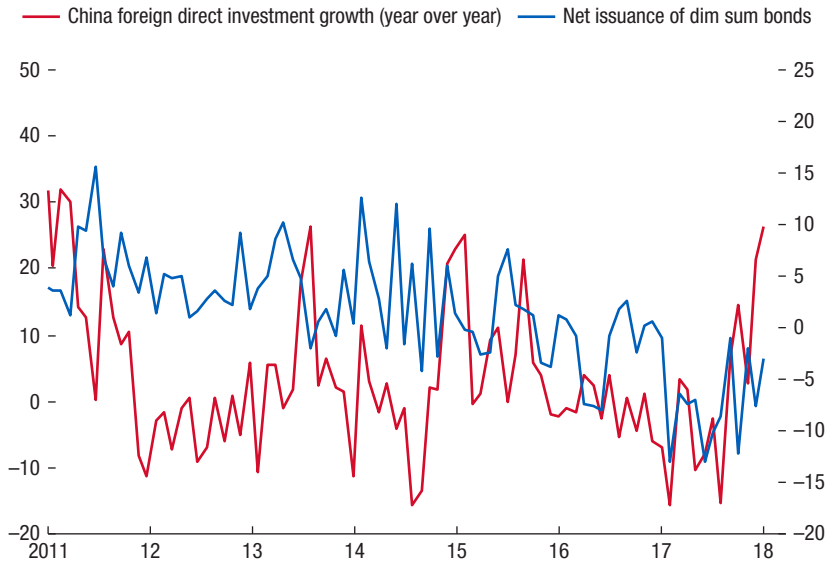
Sources: Bloomberg L.P.; CEIC data; and authors' calculations.

To explain issuance activity in the offshore renminbi bond market, the net issuance of dim sum bonds is used to examine its dynamics with different driving factors. One motive for enterprises to raise offshore renminbi funds is to finance their direct investment overseas or in China. Past development shows that net issuance of dim sum bonds has stronger co-movement with China's ODI than inward FDI (Figures 15.8 and 15.9). This echoes the fact that China's mainland firms have been more active than foreign companies in raising renminbi funds in the dim sum bond market (see Figure 15.3). Given that a significant portion of ODI conducted by mainland firms is in the form of outbound merger and acquisitions, which are usually settled in US dollars or other foreign currencies, the use of renminbi would be more common in developing economies with closer economic ties with China, as they can use renminbi to settle imports of goods and services from China.¹⁰ This can be seen from the rapid expansion in China's ODI

¹⁰ China's ODI settled in renminbi has been growing. For example, a mainland petroleum company invested in an oil field in Brunei. Given that about 80 percent of oil extraction and refinery facilities will be constructed by mainland contractors, the mainland investor agreed to use renminbi to settle the investment in the oil field to reduce exchange rate risk and conversion costs.

Figure 15.9. China's Foreign Direct Investment and Net Issuance of Dim Sum Bonds, 2011–17

(Percent, left scale; billions of renminbi, right scale)



Sources: Bloomberg L.P.; CEIC data; and authors' calculations.

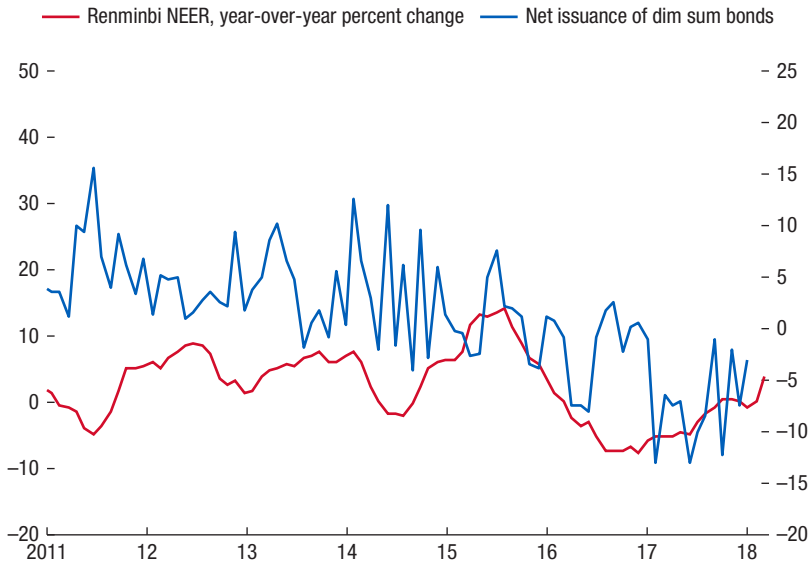
settling in renminbi from RMB 27 billion in 2011 to RMB 1,062 billion in 2016, before easing to RMB 457 billion in 2017.¹¹

Policy factors may also play a role in boosting issuance of dim sum bonds in the offshore market. For mainland firms seeking external financing, the People's Bank of China together with the State Administration of Foreign Exchange will set an upper limit based on the net assets of the company and a macroprudential factor (risk factor) determined by the regulator. In general, the risk factor of external borrowing in foreign currencies is higher than that for renminbi borrowings, which makes issuing renminbi bonds less restrictive. Meanwhile, the "going out" policy advocated by the central government propelled China's ODI during 2015–16. This may also partly explain the pickup in net issuance of dim sum bonds over the same period.¹²

¹¹ Given that ODI settling in renminbi is compiled using both credit and debit transaction data, the figures are not directly comparable to the headline ODI figures released by the Ministry of Commerce and the National Bureau of Statistics.

¹² "Going out" or "going global" policy refers to the Chinese government's initiatives to promote and encourage mainland enterprises to invest overseas. These initiatives include policy to facilitate ODI through merger and acquisitions, or expansion of business abroad by setting up subsidiaries overseas.

Figure 15.10. Renminbi NEER and Net Issuance of Dim Sum Bonds, 2011–17
(Percent, left scale; billions of renminbi, right scale)



Sources: Bloomberg L.P.; CEIC data; and authors' calculations.

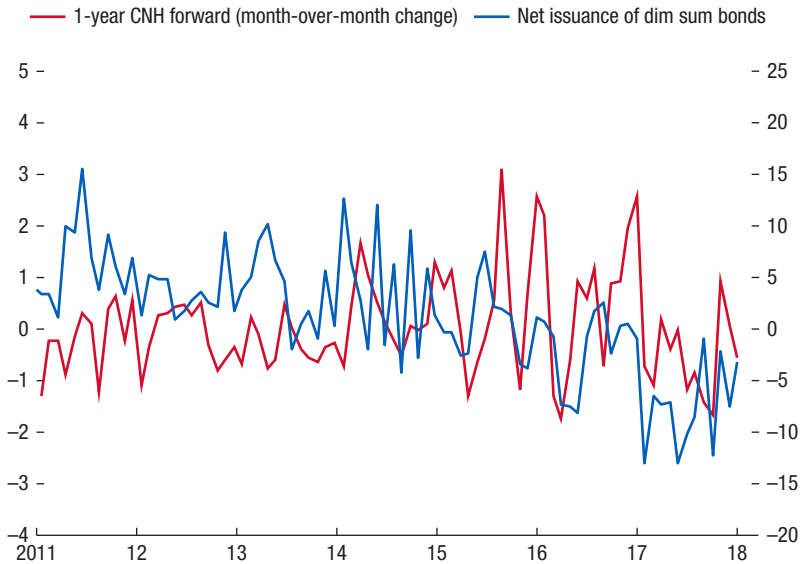
Note: NEER = nominal effective exchange rate.

To overcome the currency mismatch between the source and use of funds, some dim sum bond issuers may swap renminbi into US dollars in the offshore market to fund their overseas investment. Mainland issuers that receive US dollar revenues generated from their overseas investments may swap the US dollar proceeds into renminbi to pay off the mature dim sum bonds. This suggests that the renminbi exchange rate and hedging cost play a role, as they would affect overall funding costs. Historically, appreciation of the renminbi effective exchange rate has tended to support external financing using dim sum bonds, while depreciation has discouraged issuance activities (Figure 15.10).¹³ Apart from exchange rate considerations, hedging costs may also influence issuance of dim sum bonds if the issuers plan to swap back their US dollar proceeds from overseas investment to settle renminbi bond payments at maturity. This suggests that a weaker renminbi forward rate may increase such incentives, which can be shown from the positive correlation between net issuance of dim sum bonds and changes in the one-year offshore renminbi forward rate, which is a proxy of hedging costs (Figure 15.11).

Apart from funding overseas investment, dim sum bond issuers may also use the renminbi funds raised to support their onshore business. As discussed, there

¹³ Based on the nominal effective exchange rate of renminbi estimated by the Bank for International Settlements.

Figure 15.11. CNH Forward and Net Issuance of Dim Sum Bonds, 2011–17
(Percent, left scale; billions of renminbi, right scale)



Sources: Bloomberg L.P.; and authors' calculations.

Note: CNH forward = offshore renminbi/US dollar forward rate.

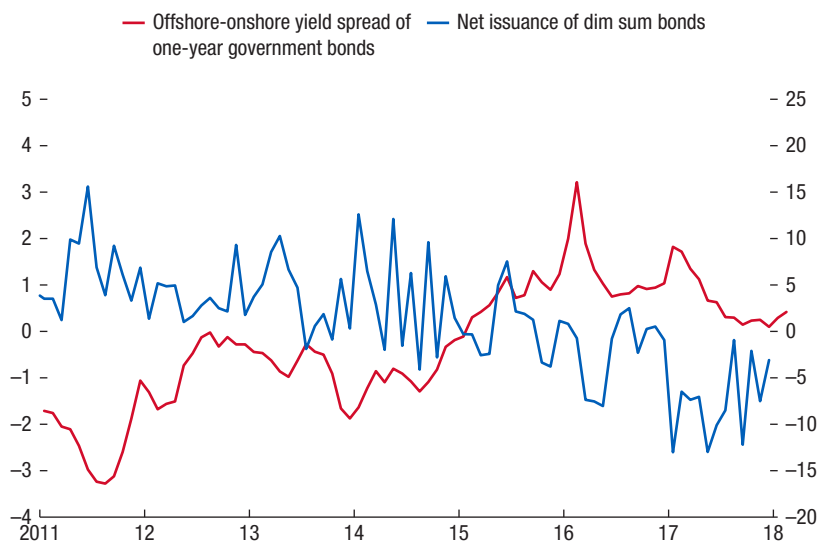
is a strong incentive for international and mainland issuers to borrow renminbi offshore when there is a cost advantage of doing so. A study by HE, Luk, and Zhang (2015) suggests that interest rate differential is a crucial factor driving the international demand for renminbi assets and liabilities. An examination of the yields of renminbi sovereign bonds issued in the offshore and onshore markets shows that there has been an inverse relationship between yield differentials and net issuance of dim sum bonds (Figure 15.12).¹⁴

The preceding observations suggest that at the firm level, factors such as the cost of funds raised, exchange rate fluctuations, hedging costs, and use of funds could help explain issuance activity in the dim sum bond market.¹⁵ At the macro level, real economic activities and changes in policy could also affect the fundraising decisions of firms. One useful proxy for gauging real activities is growth in China's industrial production in value-added terms, given its high correlation with GDP growth and high data frequency. Figure 15.13 shows that net issuance in the dim sum bond market follows a trend similar to growth in China's industrial production.

¹⁴ The repatriation of offshore renminbi funds onshore has become more common since 2011, when mainland authorities allowed such cross-border movement of funds for direct investment.

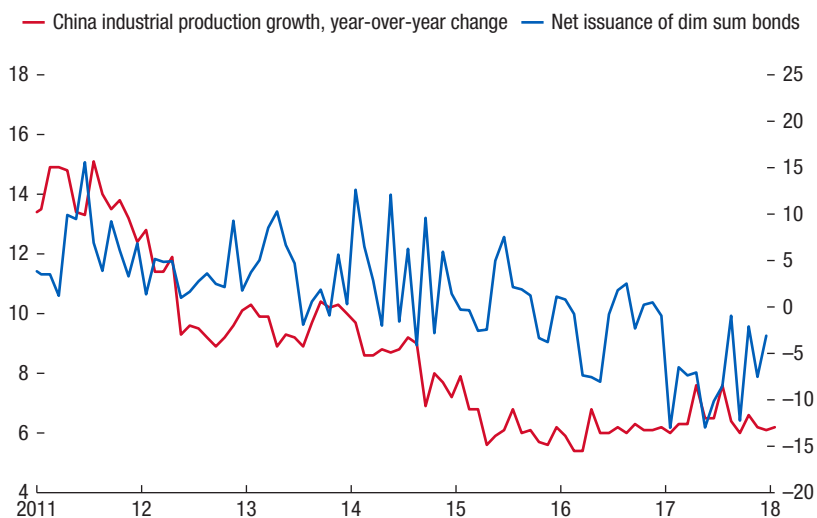
¹⁵ For analysis of the factors determining firms' decisions in investing and raising funds in offshore renminbi bond market, see Mizen and Tsoukas (2015).

Figure 15.12. Yield Differentials and Net Issuance of Dim Sum Bonds, 2011–17
(Percentage points, left scale; billions of renminbi, right scale)



Sources: Bloomberg L.P.; CEIC data; and authors' calculations.

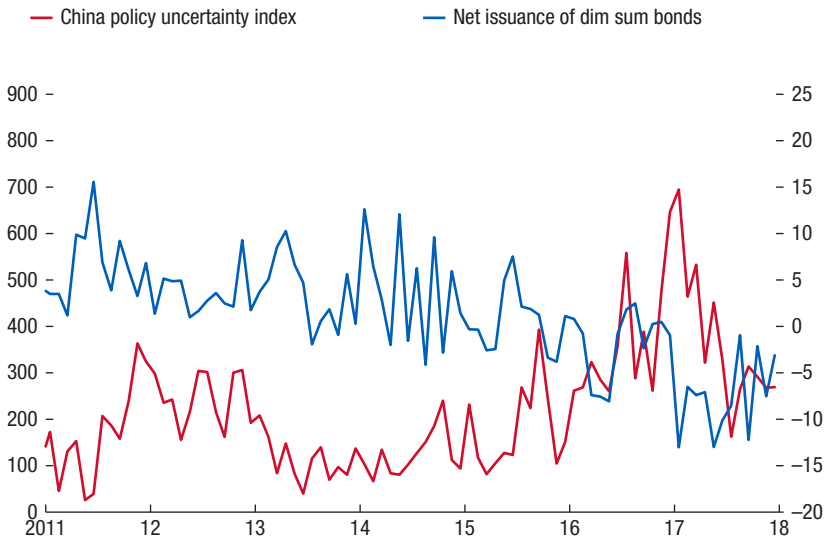
Figure 15.13. Industrial Production Growth and Net Issuance of Dim Sum Bonds, 2011–17
(Percent, left scale; billions of renminbi, right scale)



Sources: Bloomberg L.P.; CEIC data; and authors' calculations.

Figure 15.14. Policy Uncertainty Index and Net Issuance of Dim Sum Bonds, 2011–17

(Index, left scale; billions of renminbi, right scale)



Sources: Bloomberg L.P.; CEIC data; and authors' calculations.

With the capital controls policy still in place, any changes to liberalization measures would have a significant impact on renminbi fundraising in the offshore market. One example is the 2011 policy on the use of offshore renminbi funds by mainland firms to support ODI, which helped boost issuance of offshore renminbi bonds by these firms. During 2016–17, increased scrutiny of cross-border capital flows and ODI by the Chinese authorities, however, dampened external financing activities of mainland issuers. Using the Economic Policy Uncertainty Index compiled by Baker, Bloom, and Davis (2016) to gauge the change in China's policy stance suggests that a marked increase in policy uncertainty tends to weigh on dim sum bond issuance in the offshore market (Figure 15.14).¹⁶

FACTORS DRIVING ISSUANCE OF DIM SUM BONDS: EMPIRICAL FINDINGS

To estimate the impact of different factors on net issuance of dim sum bonds, which is calculated by gross issuance net of matured amount, this analysis uses monthly offshore renminbi bond data compiled by Bloomberg. The sample

¹⁶ Details on the methodology can be found in Baker, Bloom, and Davis (2016).

period spans January 2011 to December 2017. Dim sum bonds are defined as renminbi-denominated bonds issued in Hong Kong SAR by nonbank corporations. Certificates of deposit are excluded because they are deposit-like products issued by banks for funding purposes. Nonbank corporations exclude insurers and public sector issuers such as sovereigns, government agencies, and multilateral organizations such as the World Bank and the Asian Development Bank.

To estimate the relationship between net issuance of dim sum bonds (net issuance) and macro and policy factors, regression analysis is used, as specified in equation (15.1), to estimate the impact of different factors on issuance activities in the dim sum bond market.

$$\begin{aligned} \text{Net issue}_t = & \alpha + \beta_1 IP_t + \beta_2 \text{Cost}_t + \beta_3 FX_t \\ & + \beta_4 \text{Hedge}_t + \beta_5 \text{Uses}_t + \beta_6 \text{Policy}_t + \varepsilon_t, \end{aligned} \quad (15.1)$$

where *IP* denotes China's industrial production growth, which is a proxy for macroeconomic factors and serves as a control variable; *Cost* denotes factors related to differences in borrowing costs between the offshore and onshore markets; *FX* denotes the effect of the renminbi effective exchange rate; and *Hedge* is a measure of the hedging cost of bond issuers if there is a need to swap the renminbi funds into foreign currency. The one-year offshore renminbi/US dollar (CNH) forward rate is used as a proxy, with an increase in the forward rate denoting a weaker renminbi or lower hedging cost. *Uses* denotes factors related to the use of renminbi funds raised, and *Policy* denotes factors related to mainland China policy.

Industrial production growth is used to gauge macroeconomic conditions in China given its higher data frequency than GDP and its high correlation with economic growth. To gauge the difference in borrowing costs, the yield differential of one-year sovereign bonds issued by China's Ministry of Finance in offshore and onshore markets is used, given their high liquidity in the secondary markets, and assuming that credit spreads of the same issuers would be similar in both markets.

The renminbi nominal effective exchange rate (NEER) and one-year CNH forward rate are used to gauge the impact of exchange rate fluctuations and changes in hedging costs on net issuance of dim sum bonds. In general, a stronger renminbi tends to boost market sentiment, and it would be beneficial for issuers to swap renminbi into foreign currencies for use overseas. Meanwhile, a weaker renminbi forward rate in the offshore market suggests that the cost of swapping foreign currency back to renminbi would be cheaper at a specified time in the future. Both would increase the incentive for dim sum bond issuers to swap the renminbi funds raised into foreign currency, and vice versa upon the maturity of the bond, to fund their investment overseas. This suggests that the renminbi NEER and CNH forward rate should be positively correlated with net issuance of dim sum bonds, as shown in Table 15.3.

On the use of renminbi funds raised, faster growth in China's FDI and ODI tends to boost dim sum bond issuance, but the correlation between net issuance and FDI is 0.13, much weaker than the correlation of 0.36 with ODI. This

TABLE 15.3.

Correlation of Net Issuance of Dim Sum Bonds and Its Determinants								
	1	2	3	4	5	6	7	8
1. Net issuance								
2. Industrial production growth	0.56							
3. Yield differentials	-0.60	-0.86						
4. RMB NEER	0.28	0.03	-0.12					
5. CNH forward	0.12	-0.19	0.12	0.01				
6. ODI growth	0.36	0.12	-0.13	0.03	0.11			
7. FDI growth	0.13	0.23	-0.22	0.15	-0.03	-0.05		
8. Policy uncertainty	-0.50	-0.36	0.50	-0.46	0.10	-0.10	-0.34	

Sources: Bloomberg LP; CEIC data; and authors' calculations.

Note: CNH forward = offshore renminbi/US dollar forward rate; FDI = foreign direct investment; NEER = nominal effective exchange rate; ODI = outward direct investment; RMB = renminbi.

probably reflects the less dominant role of international issuers in the dim sum bond market (see Figure 15.3). As a result, this analysis uses China's ODI as a proxy for the use of funds by dim sum bond issuers.

To capture the impact of policy changes on issuance activities in the dim sum bond market, the political uncertainty index is used based on the frequency of the appearance of key words related to changes in mainland China's policy in the headlines in Hong Kong SAR's *South China Morning Post*. The index is compiled by Baker, Bloom, and Davis (2016) of the research group Economic Policy Uncertainty.¹⁷

Putting the six explanatory variables together, Table 15.4 shows the regression results of estimating their effects on the net issuance of dim sum bonds.¹⁸ To show the robustness of parameter estimates, explanatory variables are included one by one in the regression model. First, growth in industrial production is included, which is a control variable used to capture changes in macroeconomic conditions in China. Second, the one-month lag of offshore-onshore yield differentials is used to dampen its collinearity with other explanatory variables.¹⁹ Third, the one-month lag of year-over-year growth in the renminbi NEER and month-over-month growth in the one-year CNH forward are included. Fourth, China's ODI and FDI growth are added, but the results show that only the former is significant. Finally, the Economic Policy Uncertainty Index is added in the model.

The full model estimates show that regression coefficients are significant with correct signs, with R^2 of 58 percent (the last column of Table 15.4). China's FDI

¹⁷ The research group Economic Policy Uncertainty uses a similar methodology in compiling the political uncertainty index for China as it does for the United Kingdom and the United States.

¹⁸ Summary statistics of the explanatory variables are listed in Annex Table 15.1.2 in Annex 15.1.

¹⁹ Given the high correlation between yield differential and industrial production growth, which is -0.86, as shown in Table 15.3, the one-month lag of yield differential is used as an instrumental variable because of its high correlation with net issuance of dim sum bonds and weak collinearity with other regressors.

TABLE 15.4.

Multiple Regression Results of Net Issuance of Dim Sum Bonds					
Specification	A	B	C	D	Full Model
Constant	-9.19 *** (1.80)	-1.49 (2.87)	-4.67 (2.87)	-5.30 ** (2.71)	-3.30 (2.85)
Industrial production growth (year-on-year in percent)	1.21 *** (0.20)	0.23 (0.35)	0.55 (0.34)	0.53 (0.32)	0.54 * (0.32)
Offshore-onshore yield differentials (1-month lag, percentage point)		-2.46 *** (0.69)	-1.83 *** (0.68)	-1.73 *** (0.64)	-1.37 ** (0.66)
Changes in renminbi NEER (1-month lag, year-on-year in percent)			0.25 *** (0.09)	0.25 *** (0.08)	0.17 * (0.09)
Changes in 1-year CNH forward (month-on-month in percent)			0.99 * (0.52)	0.76 (0.49)	0.90 * (0.49)
ODI growth (seasonally adjusted, year-on-year in percent)				0.05 *** (0.02)	0.05 *** (0.02)
FDI growth (seasonally adjusted, year-on-year in percent)				-0.01 (0.04)	
China Political Uncertainty Index (divided by 100)					-0.78 * (0.42)
N	84	83	83	83	83
R ²	31.1%	41.3%	49.1%	56.0%	57.9%
Adjusted R ²	30.2%	39.8%	46.4%	52.5%	54.6%
Durbin-Watson statistics	1.37	1.53	1.74	1.91	1.94

Source: authors' calculations.

Note: Numbers in parentheses are standard errors of coefficient estimates. CNH forward = offshore renminbi/US dollar forward rate; FDI = foreign direct investment, NEER = nominal effective exchange rate; ODI = outward direct investment.

* $p < 0.1$ ** $p < .05$ *** $p < .01$.

is not included in the full model because it is insignificant. For individual explanatory variables, an increase of 1 percentage point in industrial production growth would on average boost the net issuance of dim sum bonds (the dependent variable) by RMB 0.54 billion, or 0.13 percent of outstanding dim sum bonds at the end of 2017. In terms of borrowing costs, if offshore bond yields come down by 1 percentage point relative to the onshore counterpart, net issuance would increase by RMB 1.37 billion, or 0.32 percent of the outstanding amount. On the exchange rate effect, annual renminbi appreciation of 1 percent against a basket of currencies would boost net issuance of dim sum bonds by RMB 0.17 billion, equivalent to 0.04 percent of the outstanding amount. For hedging costs, if the renminbi forward rate depreciated by 1 percent month over month, net issuance would expand by RMB 0.9 billion, or 0.21 percent of the outstanding amount. On the uses of funds, if China's ODI growth picked up 1 percentage point, this would drive up net issuance by RMB 0.05 billion, or 0.012 percent of the outstanding amount. For the impact of policy changes, an increase in 100 points in the political uncertainty index would drag down net issuance of dim sum bonds by RMB 0.78 billion, equivalent to 0.18 percent of the outstanding amount.

To compare the relative contribution of individual explanatory variables to the variation of net issuance of dim sum bonds, equation (15.1) can be expressed in variance form represented by equation (15.2):²⁰

$$\begin{aligned} \text{Var}(\text{Net Issue}) = & \beta_1^2 \text{Var}(X_1) + \beta_2^2 \text{Var}(X_2) + \beta_3^2 \text{Var}(X_3) + \\ & \beta_4^2 \text{Var}(X_4) + \beta_5^2 \text{Var}(X_5) + \\ & \beta_6^2 \text{Var}(X_6) + \text{Var}(\varepsilon) + \sum_{i \neq j} \beta_i \beta_j \text{Cov}(X_i, X_j), \end{aligned} \quad (15.2)$$

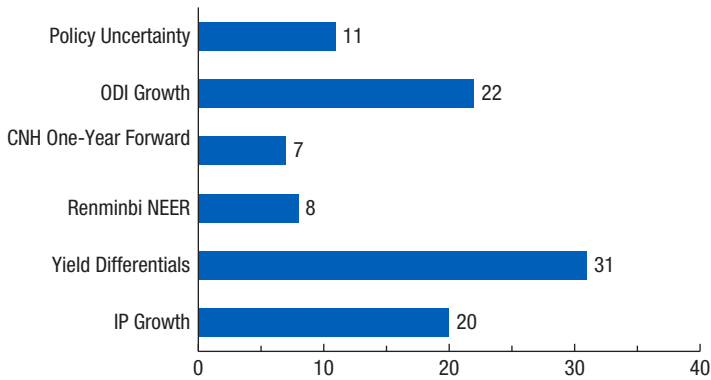
where $\text{Var}(\text{Net Issue})$ is the variance of net issuance of dim sum bonds. In total, the six regressors explain about 58 percent of variance in net issuance as indicated by the R^2 , while the rest is unexplained and captured by the variance of the error term or $\text{Var}(\varepsilon)$. Given that the cross-product terms $\sum_{i \neq j} \beta_i \beta_j \text{Cov}(X_i, X_j)$ cannot be disentangled by individual explanatory variables and regressors are orthogonal to the error term ε , the variance of net issuance explained by individual regressors, or the model variance, could be simplified to the following:

$$\begin{aligned} \text{Var}(\text{Net Issue}^\wedge) = & \beta_1^2 \text{Var}(X_1) + \beta_2^2 \text{Var}(X_2) + \beta_3^2 \text{Var}(X_3) + \\ & \beta_4^2 \text{Var}(X_4) + \beta_5^2 \text{Var}(X_5) + \beta_6^2 \text{Var}(X_6), \end{aligned} \quad (15.3)$$

where Net Issue^\wedge is estimated net issuance of dim sum bonds based on regression, as opposed to the observed or actual net issuance of dim sum bonds. From equation (15.3), the term $\beta_1^2 \text{Var}(X_1)$ represents the contribution of industrial production growth to the variance of estimated net issuance. The same interpretation can be applied to the rest of the explanatory variables. The contribution of an

²⁰ The decomposition of variance of the dependent variable is similar to the method used by Altman, Fargher, and Kalotay (2011) in examining the relative importance of individual factors in explaining the default probability of borrowers.

Figure 15.15. Contribution to Model Variance, by Explanatory Variable (Percent)



Source: Authors' calculations.

Note: CNH forward = offshore renminbi/US dollar forward rate; IP = industrial production; NEER = nominal effective exchange rate; ODI = outward direct investment.

individual regressor to the variance of estimated net issuance can be expressed as follows:

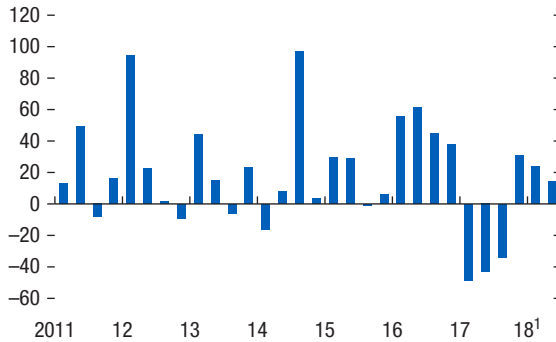
$$Share_i = \frac{\beta_i^2 \sigma_i^2}{\sum_i \beta_i^2 \sigma_i^2}, \quad (15.4)$$

where $Share_i$ is the portion of model variance attributable to explanatory variable i , β_i is the regression coefficient, and σ_i^2 is the variance of explanatory variable i .

Figure 15.15 compares the contribution of individual regressors to the variance of estimated net issuance of dim sum bonds. During the sample period, yield differentials explained most of the variation of the estimated net issuance of dim sum bonds, contributing 31 percent to the model variance. This suggests that differences in borrowing cost could be a key consideration for corporate owners in choosing between onshore and offshore markets in issuing renminbi bonds. Both ODI and industrial production growth explained about one-fifth of variation in net issuance estimated by the model, suggesting that the issuance of dim sum bonds is driven by the investment needs of corporations and macroeconomic conditions, which are key determinants of corporate funding demand.²¹ Changes in the renminbi effective exchange rate and hedging cost together explained about 15 percent of the variation of net issuance estimated by the model, while the

²¹ Studies by IMF economists Ayala, Nedeljkovic, and Saborowski (2015) indicate that macroeconomic fundamentals play an important role in fostering bond market development in emerging market economies.

Figure 15.16. Growth in China's Nonfinancial Outward Direct Investment, 2011–18
(Percent, year over year)



Sources: CEIC data; and authors' calculations.

¹ Data for 2018 are through the second quarter.

factor of policy uncertainty contributed 11 percent to the model variance. While the decomposition of model variance indicates that differences in offshore-onshore borrowing costs, the investment needs of corporations, and the macroeconomic environment play key roles in driving dim sum bond issuance, the results should be interpreted with caution as these are crude estimates and could be sensitive to sample size. The relatively small sample of some 80 observations suggests that the regression results may be subject to omitted variable bias and endogeneity in parameter estimates.

NEAR-TERM PROSPECTS OF THE DIM SUM BOND MARKET

Given that the dim sum bond market serves as an alternative renminbi fundraising platform, its near-term prospects will hinge on the mainland economic outlook, corporate investment needs, and borrowing costs, as these are the key considerations for international and mainland issuers to issue renminbi bonds in the offshore market.²² Empirical findings suggest that the decline in dim sum bond issuance in recent years could be attributed to the moderation of China's GDP growth and slowdown in ODI (Figure 15.16). Meanwhile, the reduction in renminbi deposits in the offshore market has also driven up borrowing costs in the dim sum bond market relative to the onshore counterpart.

As the mainland economy is rebalancing from investment to consumption, it is reasonable to expect some moderation of GDP growth in the foreseeable future.

²² For a detailed discussion on the role of the dim sum bond market, see Fung and Yau (2012).

Provided that the slowdown in GDP growth is gradual, say from near 7 percent in recent years to 6–6.5 percent in the next few years, its impact on external borrowing through the dim sum bond market should be manageable. In comparison, the trend of offshore borrowing costs and ODI would play a more important role in driving dim sum bond issuance, underpinned by China's "going-out" policy and Belt and Road Initiative. Factors such as fluctuations in the renminbi exchange rate and policy uncertainty are likely to affect market sentiment, which could have short-term impacts on the dim sum bond market. For example, renminbi depreciation and increased scrutiny of overseas investment by mainland authorities are likely to weigh on dim sum bond issuance, while tightening in onshore liquidity conditions would increase the incentive for mainland issuers to borrow abroad.

CONCLUSIONS

Underpinned by measures liberalizing external use of renminbi and cross-border renminbi fund flows between onshore and offshore markets, the dim sum bond market has expanded rapidly since 2011. The moderation of dim sum bond issuance in 2017 could be due to a slowdown in China's ODI following increased scrutiny of capital outflows. The recent rebound in ODI and higher onshore borrowing costs could revive issuance of renminbi bonds in the offshore market, as indicated by their strong co-movement in the past.

While an active offshore dim sum bond market helps promote the external use of renminbi, the dominant role of mainland China's issuers indicates room exists to increase the participation of international issuers in tapping offshore renminbi funds to support their onshore business and investment. Given bond issuers' need to manage exchange rate risk, a liquid market for hedging instruments also helps promote raising renminbi funds through the dim sum bond market.

The growing integration of capital markets between China and Hong Kong SAR, such as the launch of Bond Connect, expands the choice of renminbi assets available to offshore investors. That said, the fundraising function of dim sum bonds would not be affected much given that it is less accessible for foreign issuers to tap renminbi funds in the onshore market. Given the free flow of capital, highly accessible market, and internationally recognized strong legal and regulatory frameworks, the dim sum bond market remains an attractive platform for international and mainland issuers to tap renminbi funds outside China. For global investors, dim sum bonds offer an additional choice of renminbi assets to international investors, which promotes the external use of renminbi in securities transactions.²³ These roles of the dim sum bond market are likely to continue, despite the opening up of onshore financial markets.

²³ For the discussion of renminbi as an investing and funding currency, please see He, Luk, and Zhang (2015).

ANNEX 15.1

ANNEX TABLE 15.1.1.

Policy Announcements Related to the Dim Sum Bond Market, 2007–15			
Month and Year	Policies	Issuer	Implications
Jun. 2007	“Interim Measures for the Administration of the Issuance of RMB Bonds in Hong Kong SAR by Onshore Financial Institutions”	National Development and Reform Commission	The issuance of RMB bonds in Hong Kong SAR by onshore financial institutions
Feb. 2010	“Elucidation of Supervisory Principles and Operational Arrangements Regarding Renminbi Business in Hong Kong SAR”	Hong Kong Monetary Authority	Multinational companies and international financial institutions
Oct. 2011	“Administrative Measures on RMB Settlement in Foreign Direct Investment”; “Circular Concerning Certain Issues on Direct Investment Involving Cross-border RMB”	People’s Bank of China Ministry of Commerce	Simplify approval process for repatriation of RMB bond proceeds back to China by issuers not incorporated in the mainland. The Ministry of Commerce Circular allows foreign investors to use offshore RMB, including funds raised from issuing bonds, to conduct direct investment or to repay loans in China.
May 2012	“Circular on the Matters Relating to the Issuance of RMB Bonds in Hong Kong SAR by Onshore Non-Financial Institutions”	National Development and Reform Commission	The NDRC circular formalized the approval process and stipulated the regulatory framework for onshore mainland China nonfinancial institutions to issue RMB bonds in Hong Kong SAR, compared to a discretionary basis previously used by the authority.
May 2014	“Regulations on Foreign Exchange Administration of Cross-Border Guarantees and Security”; “Operational Guidelines on Foreign Exchange Administration of Cross-Border Guarantees and Security”	State Administration of Foreign Exchange	Replace approval-based issuance with registration-based cross-border guarantee for using funds raised from offshore bonds in overseas investment.
Sep. 2015	“Notice on Promoting the Reform of the Filing and Registration System for Issuance of Foreign Debt by Corporates”	National Development and Reform Commission	Registration-based issuance for mainland issuers with a national annual quota, compared to approval-based issuance.

Sources: Media reports; and websites of authorities in China.

Note: NDRC = National Development and Reform Commission; RMB = renminbi.

ANNEX TABLE 15.1.2.

Key Statistics of Explanatory Variables in Multiple Regression				
Independent Variable	Mean	Standard Deviation	Minimum	Maximum
Industrial production growth (percent year-over-year)	8.7	2.7	5.4	15.1
Offshore-onshore yield differentials (percentage points)	-0.3	1.3	-3.3	3.2
Renminbi nominal effective exchange rate (percentage change year-over-year)	2.4	5.5	-7.6	14.3
One-year CNH forward rate (percentage change month-over-month)	0.03	1.0	-1.7	3.1
ODI growth (seasonally adjusted, percentage change year-over-year)	16.1	29.3	-48.7	92.1
China's Political Uncertainty Index (divided by 100)	2.2	1.4	0.3	6.9

Sources: Bloomberg L.P.; CEIC data; and authors' calculations.

Note: CNH forward = offshore renminbi/US dollar forward rate; ODI = outward direct investment.

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China's Offshore Corporate Dollar Bonds

DING Ding, HUANG Yi, and ZHOU Yue

In recent years, emerging market economies have substantially increased their corporate bond issuance in the global capital markets. Their total overseas non-government securities outstanding (by nationality of issuer) grew from less than US\$1 trillion in 2010 to close to US\$2.5 trillion by the end of 2016, according to data from the Bank for International Settlements. The majority of offshore emerging market corporate bonds have been denominated in the US dollar regardless of the location of borrowers and lenders, and bonds issued by non-financial corporations have accounted for the bulk of total US dollar bonds for most of these issuers (McCauley, McGuire, and Sushko 2015).

The literature suggests that the primary driver of the rapid increase in emerging market offshore corporate bonds is related to corporate financial decisions that suggest carry trades (Bruno and Shin 2017; HUANG, Panizza, and Portes 2018). By issuing dollar debt and using the proceeds to acquire domestic financial assets, companies can benefit from an appreciation of the domestic currency against the US dollar. The increase in carry-trade activity was also in response to the surge in demand for high-yield fixed income assets by advanced economy investors after the global financial crisis, when yields in advanced economies were compressed as a result of unconventional monetary policies.

China is among the major contributors to this growing offshore corporate bond market. By 2016, Chinese nonfinancial corporations had issued about US\$500 billion in offshore markets—about 20 percent of total emerging market economies' corporate bonds—from nearly zero in the mid-2000s. At the outset, this development reflected the liberalization of China's capital account in the past decade, including the easing of restrictions on corporations to tap into offshore financial markets (TANG and ZHU 2016). More specifically, the National Development and Reform Commission, the regulator for China's onshore enterprise bond market (see Chapter 1), implemented a policy in September 2015 to replace the previous case-by-case approval system for corporate offshore bond

issuance with a predeal filing system.¹ In 2016, the People's Bank of China also introduced a macroprudential assessment framework for cross-border financing to replace the previous ad hoc system of case-by-case approval and quota allocations. This new framework is designed to manage risks associated with capital flows by influencing the overall volume and composition of capital flows in a countercyclical manner through the use of prudential parameters, including one on excess leverage (IMF 2018b). It can be used to target single, multiple, or all financial or nonfinancial institutions in terms of overseas financing. "In 2017, the Ministry of Finance issued the first sovereign dollar bonds in over a decade, partly to serve as a benchmark for the nation's surging dollar corporate bonds."

Given that capital account liberalization represents a regime change that relaxed restrictions on Chinese firms' access to overseas financing, the question that arises is whether the surge in China's offshore corporate bond issuance is associated with carry trades, similar to developments in other emerging market economies, or whether it is driven by policy changes that resulted in more liberalized capital accounts. In the latter case, it could make the traditional functions of offshore debt markets—namely, trade financing and precautionary borrowing for future financing needs—more accessible to Chinese nonfinancial corporations.

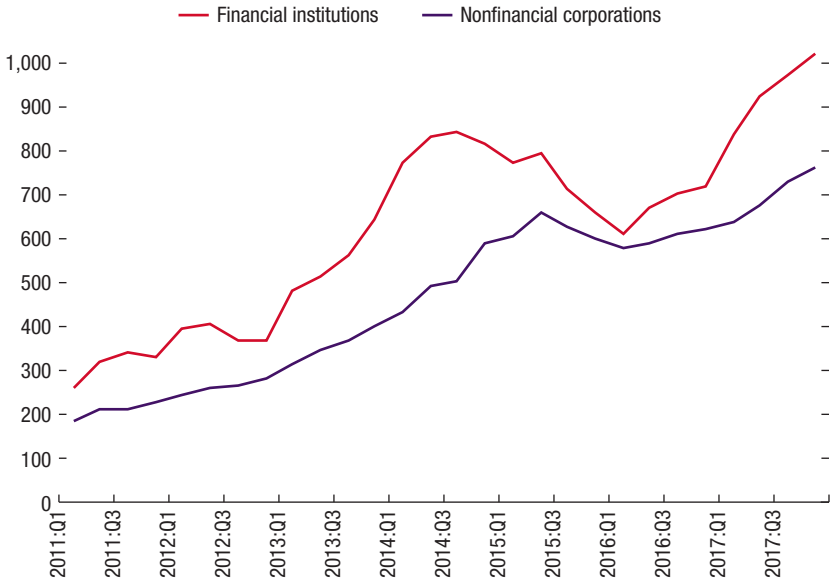
Understanding the drivers of corporate offshore bond issuance is also key to unraveling the significant shift of China's capital account balances in the past few years. Between 2013 and 2015, China's rolling annual capital account flows declined roughly US\$900 billion. More than half of the swing, about US\$500 billion, was caused by a reversal of residents' net acquisition of external liabilities—that is, debt repayments. Specifically, the fall in Chinese external liabilities primarily reflected the unwinding of previous loans from nonresidents and the repatriation of deposits of nonresidents. On an annual basis, the increased pace of foreign asset acquisition could explain about 70 percent of the deterioration in the capital account in 2014 but only roughly 15 percent in 2015—that is, a more rapid reduction of nonresident claims on China was the dominant driver of capital outflows in 2015 (IMF 2017).

In response to the capital outflow pressure, the Chinese government applied a wide range of measures, including intervention in the foreign exchange market and capital flow management measures. Together with the strengthening of the domestic growth momentum, these measures led to a substantial decline in capital outflows from about US\$640 billion in 2015–16 to less than US\$100 billion in 2017. Also, after a brief period of contraction in 2015, overseas bond market borrowing by Chinese firms recovered, with nonfinancial corporations

¹ National Development and Reform Commission Circular 2044: "Promoting the Reform of the Filing and Registration Regime for Issuance of Foreign Debt by Corporate Entities." Under this policy, issuers of offshore bonds and borrowers of offshore loans should meet the following basic requirements: a good credit track record, no record of default under previously issued bonds or other debt instruments, sound corporate governance and foreign debt risk control systems, sound credit quality, and strong debt repayment ability. The predeal filing system also applies to offshore bond offerings and borrowings by offshore subsidiaries and branches controlled by the onshore Chinese companies.

Figure 16.1. Offshore Bonds Outstanding, First Quarter 2011 to Third Quarter 2017

(Billions of US dollars)



Source: Bank for International Settlements.

accounting for almost half of the outstanding bonds as of the third quarter of 2017 (Figure 16.1).

To shed light on the determinants of offshore bond issuance by Chinese nonfinancial corporations, this chapter constructs a firm-level data set for all publicly listed nonfinancial corporations headquartered in China. Firm-level evidence suggests that US dollar bond issuance (redemption) by these companies is highly correlated with global financial cycles (see Chapter 2 on China's bond and global financial markets) and economic policy uncertainty in China, a clear indication of carry trades. Moreover, the effect of offshore bond financing on corporate investment differs across sectors. For state-owned enterprises (SOEs), which typically have relatively easy access to domestic financing (bank and bond markets), funding raised in the offshore bond market seems to be channeled to other domestic entities, with SOEs acting as financial intermediaries. For real estate developers, offshore dollar debt issuance is found to be positively correlated with the firms' domestic investment.

DATA AND STYLIZED FACTS

Data Sources

The data set combines corporate bond data from Dealogic and corporate balance sheet information from Datastream for all publicly listed firms headquartered in China for 2005–16.² The Dealogic data set contains 25,123 observations of domestic and international bond issuance by 6,027 issuers headquartered in China, of which 2,254 bonds were issued in the US dollar by 476 corporations during the sample period. About one-quarter of them, or 557 bonds, were issued by 150 publicly listed nonfinancial corporations.³

The Datastream data set contains data on 2,827 publicly listed firms headquartered in mainland China. Out of these firms, 2,365 are listed in the Shanghai and the Shenzhen stock exchanges and 462 in the Hong Kong SAR stock exchange. The two data sets are manually combined by matching the bond issuers in Dealogic and the publicly listed firms in Datastream. About one-third of firms in the combined sample issued at least one bond in 2005–16 and 6 percent of the firms in the combined sample issued dollar-denominated bonds.

Stylized Facts

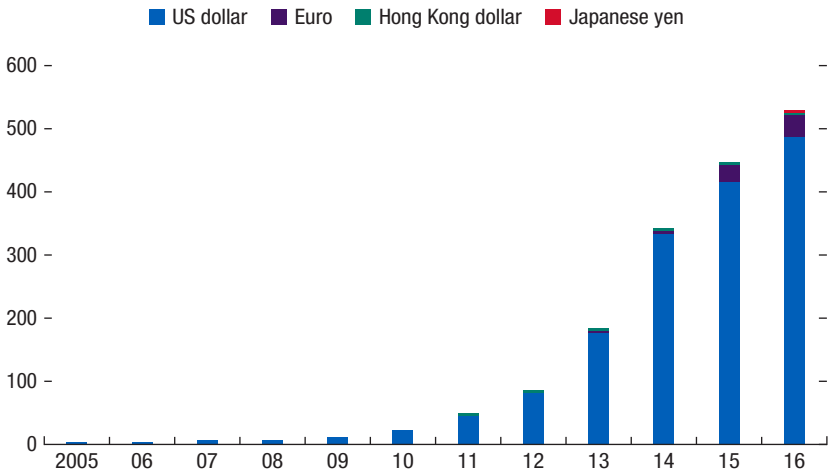
The combined data set shows that, like other emerging market economies, most of the offshore bonds issued by Chinese nonfinancial corporations were denominated in the US dollar. Less than 10 percent of the total outstanding Chinese offshore corporate bonds were issued in other currencies (Figure 16.2). The analysis that follows focuses on the US dollar–denominated bonds, all of which were issued in offshore markets.

Quarterly issuance of such bonds reached nearly US\$100 billion in the second quarter of 2014 and declined noticeably following the market turmoil in 2015 before picking up again in late 2016. Redemption of the US dollar–denominated bonds, on the other hand, picked up substantially in 2015 as the renminbi weakened considerably against the US dollar, breaking the steady appreciation trend that started several years back. Given that the average maturity of the US dollar–denominated bonds issued in 2013–15 was around six years, a large fraction of the redemption in 2015–16 represented early repayment before maturity (Figure 16.3).

² Given that many Chinese corporations choose to issue foreign currency bonds through their Hong Kong SAR subsidiaries, the sample includes firms with headquarters in mainland China instead of Chinese firms by nationality.

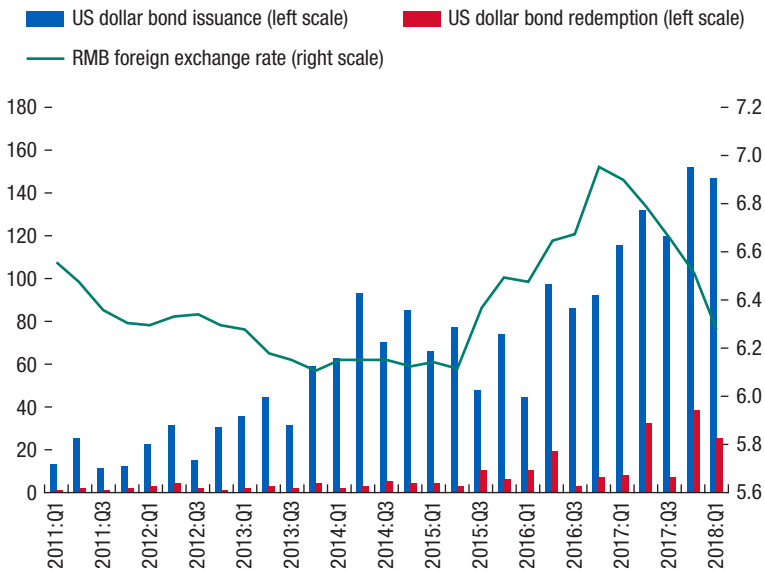
³ This study first dropped from the Dealogic sample the 7,760 bonds issued by Chinese financial institutions and 634 bonds issued by the central government. It then dropped the 12,508 bonds issued by nonlisted firms. The remaining 4,671 bonds were issued by 1,370 issuers controlled by 871 listed firms, of which 557 bonds were issued by 238 firms (controlled by 150 parent firms) in US dollars. This constitutes the final sample of the US dollar bond issuers. The study then manually matched the US dollar bond sample with the listed firms for 2005–16.

Figure 16.2. Foreign Bond Composition, All Sectors, 2005–16
(Billions of US dollars)



Sources: Bank for International Settlements; and Dealogic.

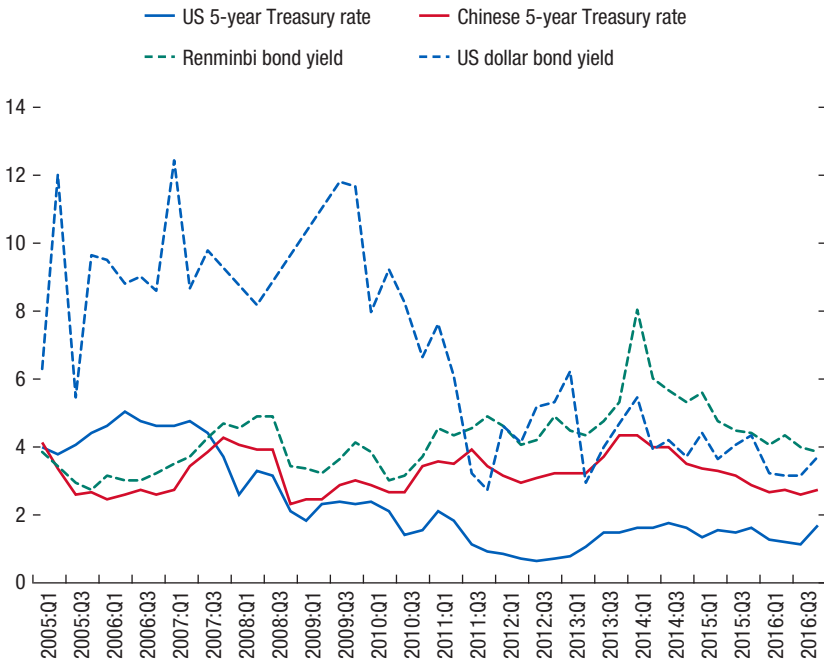
Figure 16.3. Quarterly Bond Issuance, Redemption, and Foreign Exchange Rate, First Quarter 2011 to First Quarter 2018
(Billions of US dollars, left scale; percent, right scale)



Sources: Bank for International Settlements; and Dealogic.

Note: RMB = renminbi.

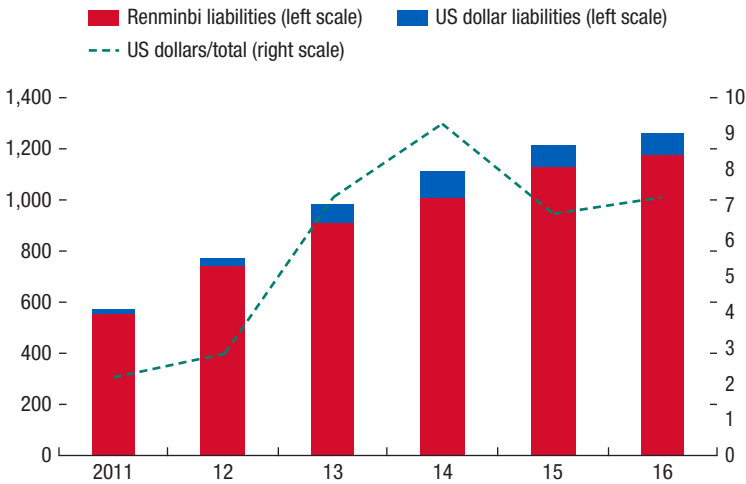
Figure 16.4. Interest Rate Spreads between China and the United States, First Quarter 2005 to Third Quarter 2016
(Basis points)



Source: Bank for International Settlements; and Dealogic.

The cyclical behavior of offshore bond issuance and redemption resembles the characteristics of carry trades. Before the global financial crisis, the average yield on the five-year US Treasury bill was almost twice that of the five-year Chinese government bond. However, by 2008, the spread had turned positive, with the yield on the five-year Chinese government bond exceeding that of the US five-year Treasury bill. The spread rose steadily to around 2 percent by 2015. Similarly, before 2008, the average yield on the dollar bond issued by Chinese corporations, at around 10 percent, was twice that of RMB-denominated Chinese corporate bonds. In 2013, the funding cost in China's onshore corporate bond market was almost 100 basis points higher than the cost in the offshore US dollar bond market (Figure 16.4).

As corporations increased their offshore financing to take advantage of the relatively low funding cost in the offshore markets, the share of dollar-denominated liabilities in total corporate liabilities rose rapidly and reached a peak of 9 percent in 2014 (Figure 16.5). The ratio declined in subsequent years, mostly because of rising domestic liabilities as the onshore corporate bond market experienced a bull run (Chapter 1).

Figure 16.5. Dollar Debt versus Renminbi Debt, 2011–16*(Millions of US dollars, left scale; percent, right scale)*

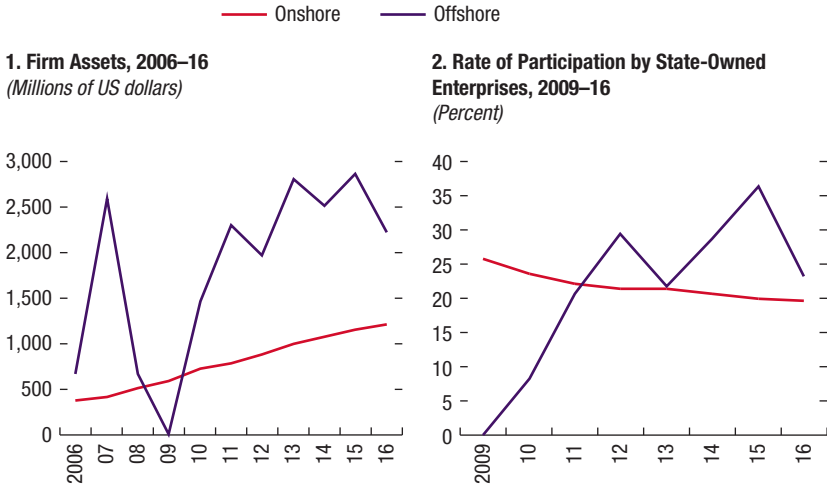
Sources: Bank for International Settlements; and Dealogic.

Issuers of US Dollar–Denominated Bonds

The sample here shows that large firms and SOEs account for the bulk of China's offshore US dollar–denominated bonds (Figure 16.6). Firms with access to the offshore bond markets are on average twice as large in terms of assets as the rest of the sample. SOEs also have a bigger presence in offshore bond markets than in onshore markets, suggesting that, on average, SOEs tend to have easier access to offshore markets than non-SOEs.

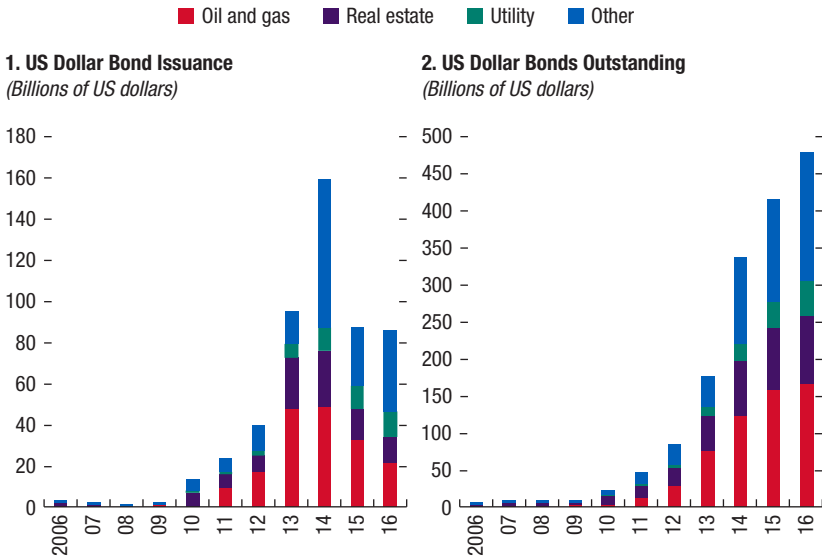
At the sectoral level, the sample indicates that oil and gas, real estate, and the utility sectors have the highest exposures to offshore bond markets (Figure 16.7). Altogether, these three sectors account for two-thirds of total dollar bonds issued by Chinese nonfinancial corporations. For the oil and gas sector, total dollar bonds outstanding grew from US\$1.7 billion in 2006 to US\$166 billion in 2016, accounting for 35 percent of the total dollar bonds outstanding. This substantial increase was driven by the sharp increase in China's demand for commodities. The real estate sector dominated offshore bond issuance before 2011, accounting for more than 60 percent of total dollar bonds issued by Chinese corporations. However, its share declined steadily to less than 20 percent by 2016, in part because of the government's window guidance on developers' offshore financing to contain overheating in the residential real estate market. It is noticeable in the utility sector that most firms are local government financing vehicles or city construction companies (*chengtuo*) under increasing scrutiny domestically as the government tightens local government financing frameworks (see Chapters 5 and 12).

Figure 16.6. Firm Characteristics in Onshore and Offshore Markets, 2006–16



Source: Datastream.

Figure 16.7. Major Sectors in the Offshore Market, 2006–16



Source: Dealogic.

EMPIRICAL ANALYSIS

Determinants of Offshore Dollar Bond Issuance

This section uses a linear regression model to detect the determinants of US dollar-denominated bonds issued by Chinese nonfinancial corporations. Specifically, it regresses the dummy variable of US dollar bond issuance on a set of firm characteristics and policy variables.

$$USD\ Issuer_{i,t} = X_{i,t} + \alpha_i + \varepsilon_{i,t} \quad (16.1)$$

The issuer dummy, $USD\ Issuer_{i,t}$, takes the value 1 if firm i issues US dollar bonds in year t . The firm characteristics, $X_{i,t}$, include external financial dependence (defined as investment minus net income scaled by investment), profit growth (revenue growth), Tobin's Q (market value divided by book value), leverage (total debt over equity), and profitability (proxied by return on assets).

In various specifications, the analysis replaces the time fixed effect α_i with the interest rate spread, the carry trade index, the Economic Policy Uncertainty Index, and the onshore RMB-denominated bond yield dispersion, respectively. The interest rate spread is calculated as the difference between the five-year Chinese government bond yield and the US five-year Treasury bill yield. The carry trade index is denoted as the interest rate spread scaled by implied foreign currency volatility, as in Bruno and Shin (2017). The Economic Policy Uncertainty Index developed by Baker, Bloom, and Davis (2016) is used as a proxy for movements in policy-related economic uncertainty for China. The RMB bond yield dispersion is the standard deviation of RMB-denominated bond yield, which captures the degree of risk differentiation.

Results are presented in the statistical tables in Annex 16.1. Annex Table 16.1.1 presents the main results. Column (1) shows that external financial dependence is negatively correlated with the likelihood of issuing US dollar bonds. As Shin and ZHAO (2013) suggest, firms normally use internal sources to finance operations and only seek outside funds after internal funds are exhausted. This pecking order theory implies that foreign bond markets should be the last resort for finance (Myers 1984). As suggested by the estimation here, at least for the firms covered in the sample, their decision to issue offshore US dollar-denominated funds was not due to the need for external financing. The results also suggest that firm profits and Tobin's Q are not correlated with the likelihood of issuing US dollar bonds, similar to the findings in Bruno and Shin (2017) for emerging market economies. US dollar bond issuance is found to be positively correlated with the firm-level leverage ratio and the return-on-assets rate.

Columns (2) and (3) show that China's offshore dollar bond issuance moves closely with the interest rate spread and the RMB-dollar bilateral exchange rate, an indication of carry trades. A higher interest rate spread and strengthening of the RMB against the dollar are associated with higher offshore bond issuance by China's nonfinancial corporations. Column (4) shows that the carry trade index,

calculated as the interest rate spread divided by exchange rate volatility, as in Bruno and Shin (2017), is also positively correlated with China's offshore dollar corporate bond issuance.

The analysis also finds a significant negative correlation between US dollar bond issuance and China's economic policy uncertainty (Annex Table 16.1.1, column (5)). As shown in Baker, Bloom, and Davis (2016), economic policy uncertainty can delay firms' financing decisions and hence negatively affect investment, employment, and output, possibly because of higher cost of corporate financing (Gilchrist, Sim, and Zakrajšek 2014), managerial risk aversion (Panousi and Papanikolaou 2012), and interactions between nominal rigidities and search frictions (Bundick and Basu 2015). In this regard, the results are consistent with the literature.

The last column of Annex Table 16.1.1 presents the effect of global funding conditions—proxied by the Chicago Board Options Exchange Volatility Index (VIX)—on dollar bond issuance by Chinese corporations. As suggested by the literature (see, for example, Fratzscher 2012), volatility in the global financial markets can have a large effect on capital flows from the advanced economies to emerging market economies. By augmenting the VIX in the regression, the analysis is able to show that firms are less likely to issue dollar bonds during periods of high volatility. As a robustness check, this analysis also estimated a logit model and obtained similar results.

US DOLLAR BOND ISSUANCE AND CORPORATE INVESTMENT

As shown in the previous section, Chinese nonfinancial corporations do not seem to issue US dollar-denominated bonds for external financing reasons. Rather, offshore bond issuance responded to the interest rate spread as well as to domestic policy uncertainty. This section explores whether offshore bond financing has a positive effect on corporate investment. The empirical analysis is specified as follows:

$$Investment_{i,t} = USD\ Issuer_i \times \beta + X_i \Gamma + \alpha_i + \tau_t + \varepsilon_{i,t}. \quad (16.2)$$

Here, investment consists of two components—fixed asset investment and inventory investment. The analysis employs two proxies for the two types of investment on the left-hand side. Capital expenditure, $CapExp_{i,t}$, is a proxy for fixed asset investment, which is defined as the net increase of property, plant, and equipment (PPE) of firm i in year t over PPE in year $t - 1$. Inventory investment, $Inventory\ Investment_{i,t}$, is defined as the net increase of inventory of firm i in year t divided by inventory in year $t - 1$. On the right-hand side, a key explanatory variable is the dummy variable, which takes the value 1 if firm i issues offshore dollar-denominated bonds in year t and 0 if otherwise. The analysis also adds the same vector of firm characteristics as in equation (16.1), including firms' external financial dependence, profit growth, Tobin's Q, leverage, and profitability.

Annex Tables 16.1.2 and 16.1.3 present the regression results on capital expenditure and on inventory investment. Annex Table 16.1.2 shows a significantly negative correlation between US dollar bond issuance and capital expenditure. US dollar bond issuers on average spend 10 percentage points less on capital expenditure. At the same time, in line with the literature, firms with higher revenue growth, higher Tobin's Q, higher leverage, and a higher return on assets tend to invest more in fixed assets. The analysis also finds that if a firm is more dependent on external funding, it tends to be more cautious about investing because of refinancing risks. These results are robust when the analysis augments the lagged capital investment in year $t - 1$ on the right-hand side and uses system generalized method of moments (GMM) to estimate the dynamic model.⁴

Annex Table 16.1.3 shows that US dollar bond issuers on average invest 8 percentage points less in inventories than non-dollar bond issuers. Again, firms with higher revenue growth, higher Tobin's Q, higher leverage, and a higher return on assets tend to invest more in inventories.⁵ These results are consistent with the findings in the previous section showing that offshore bonds issued by Chinese corporations are not driven by the corporations' financing needs.

Extensive and Intensive Margins

Following HUANG, Panizza, and Portes (2018), the analysis in this chapter explores the extensive margin and the intensive margin of US dollar bond issuance on investment, that is, whether it is the offshore bond issuance itself or the amount of issuance that hinders corporate investment. To do this, both the dummy variable and US dollar bonds outstanding are incorporated in the model. Contrary to the results in HUANG, Panizza, and Portes (2018), the analysis here finds that it is the extensive margin rather than the intensive margin that matters for investment in fixed assets and inventories for Chinese nonfinancial corporations. For both capital expenditure (Annex Table 16.1.4) and inventory investment (Annex Table 16.1.5), it is found that the coefficient of the US dollar bond issuer dummy is significantly negative (except in the dynamic model), while the coefficient on US dollar bonds outstanding is negative (or positive) and insignificant.

The results further confirm that it is US dollar bond issuance (or firms' access to the offshore bond market), rather than the amount that is raised in the offshore market, that is associated with less corporate investment. This implies that once firms have access to the offshore bond market, they tend to conduct carry trades, regardless of the amounts of bond issuance. This is also in line with the pecking order that offshore bonds are usually the last resort of financing. When a firm with less investment demand resorts to the offshore markets it is unlikely to use the offshore funding for real investment.

⁴ The system GMM result confirms a negative correlation between US dollar bond issuance and capital expenditure, though in a smaller magnitude of 6.3 percentage points.

⁵ The system GMM yields a smaller but significant coefficient of negative 5.7 for US dollar bond issuers.

Sectoral Effect

This section zooms in on the sectoral effect on US dollar bond issuance and firms' investment sensitivity toward external financial dependence across different sectors. To specify the sensitivity of corporate investment by US dollar bond issuers to their external financial dependence, the analysis adds the interaction term of the issuer and external financial dependence on the right-hand side of the regression. Furthermore, it takes into account the difference of sensitivity across sectors by adding the third interaction term of the sector dummy, which equals 1 if the firm is an SOE or is in the real estate sector or oil and gas sector, and 0 otherwise. If firms in a certain sector tend to resort to the offshore bond market because they have stronger external financing demand, one would expect the coefficient of the triple interaction term to be positive. Otherwise, one would expect a negative or insignificant coefficient on the triple interaction term.

Annex Table 16.1.6 shows the sensitivity of investment to external financial dependence for US dollar bond issuers in each sector. For SOEs, the triple interaction term is significantly negative, implying that SOEs that issue US dollar bonds as an additional source of finance are even more cautious about investment when they have higher external financial demand. In other words, SOEs are more likely to issue US dollar bonds for carry trades. This is perhaps related to SOEs' easier access to domestic bank financing and their engagement in financial intermediation. For example, Allen and others (2018) show that a nonfinancial corporation that wants to maximize carry trade returns is more likely to lend to other firms, either directly or through entrusted loans, a popular shadow banking channel through which companies provided finance to one another with banks acting as intermediaries, and SOEs are more likely than private companies to engage in entrusted loans.

For the real estate sector, the triple interaction term is significantly positive for both fixed assets and inventories. According to accounting standards, newly built houses are recorded in the inventory item for real estate developers, whereas the equipment for construction is recorded as property, plant, and equipment. The two significantly positive signs imply that the real estate sector tends to use the offshore market to finance actual investment needs.

REDEMPTIONS OF US DOLLAR-DENOMINATED BONDS

The results of the correlation between US dollar bond issuance and corporate investment are largely in line with the literature on carry trades. This section examines the effect of US dollar bond redemption on corporate investment, an issue not extensively discussed in the literature. This analysis replaces the US dollar issuance dummy (or US dollar debt outstanding) with the redemption dummy (or redemption amount over total debt) to test the effect of redemption on investment. It also mixes the redemption dummy and the redemption amount

together to separate the extensive and the intensive margin. The results are presented in Annex Table 16.1.7.

Columns (1) and (4) present the effect of US dollar bond redemption on capital expenditure and inventory investment. The analysis finds a significantly negative correlation, with a magnitude even larger than that of US dollar bond issuance. This implies that when firms repay their US dollar debt, they tend to reduce investment. Columns (2) and (5) show that the larger the amount of redemption, the more cautious firms become in investing in fixed assets.

Columns (3) and (6) illustrate the results of the extensive and the intensive margin of US dollar bond redemption. Interestingly, the intensive margin, rather than the extensive margin, is a significant factor for US dollar bond redemption. In other words, the effect of redemption on investment mainly depends on the amount of US dollar bonds to be paid back. If a firm has a small amount of US dollar debt to pay, its binding power on the firm's investment decision is negligible. The asymmetric effect of offshore US dollar bond issuance and redemption on corporate investment implies that unwinding carry trade positions may add pressure on domestic investment, even though the accumulation of corporate offshore debt may not have translated into higher investment in the first place.

CONCLUSIONS

China's offshore corporate bond issuance has experienced a sharp increase since 2012 amid rising capital inflows to emerging market economies and China's own efforts to liberalize its capital account. To understand the determinants of offshore corporate bond issuance, the analysis presented in this chapter constructs a data set that combines corporate bond data and corporate balance sheet information for all publicly listed firms headquartered in China.

The firm-level analysis indicates that the surge in China's offshore corporate dollar bonds in 2012–15, and the subsequent contraction in 2015–16—and similar to the experience of other emerging market economies—resembled the characteristics of carry trades. The evidence suggests strong cyclicity in US dollar bond issuance and redemption by Chinese nonfinancial corporations, which also drove China's capital account balances in recent years. The analysis finds that US dollar bond issuance tends to rise when China's economic policy uncertainty is low, global financial market conditions are accommodative, and the renminbi is strengthening against the US dollar. The analysis also finds that offshore bond financing has different sectoral effects on corporate investment, possibly reflecting firms' different business models and their unequal access to domestic financing sources.

The analysis also finds that US dollar bond issuance is negatively correlated with firms' dependence on external finance. This is consistent with the pecking order theory that the offshore bond market is usually the last resort of financing for corporations. US dollar bond issuers tend to invest less in fixed assets and inventories. The extensive margin (that is, the offshore bond issuance itself)

rather than the intensive margin (that is, the amount of issuance) matters for corporations' decisions on fixed assets and inventory investment—another piece of evidence that firms tend to view access to the offshore bond market as a channel to conduct carry trade activities rather than a financing source to support investment.

On the other hand, the analysis finds that US dollar bond redemption tends to rise when global financial conditions tighten and economic policy uncertainty rises domestically, adding to pressure on the capital account and the exchange rate. When corporations face redemption pressures, it is the intensive margin (that is, the amount that needs to be repaid) that tends to have a more prominent effect on firms' investment decisions. According to the data set in this analysis, bond redemption will reach US\$50 billion in the second quarter of 2018 and remain high until the second quarter of 2020, and refinancing may become a risk and negatively affect domestic investment.

By adding a triple interaction term of the US dollar issuers, external financial dependence, and the sector dummy, the analysis finds that the effect of offshore bond financing on investment is negative for SOEs and positive for the real estate sector. This perhaps reflects SOEs' easier access to domestic funding sources compared with the real sector, which has been subject to administrative and regulatory constraints on access to onshore (bank) financing.

The results indicate that the surge in China's offshore corporate dollar bonds demonstrates the characteristics of carry trade and does not seem to have contributed to corporate investment. To the extent that capital flows could carry risks for macroeconomic and financial stability—especially if they are large and volatile, as demonstrated by the large swings of China's capital account balance between 2013 and 2015—such risks need to be carefully managed.

Capital flow pressures should be primarily dealt with by macroeconomic policies, including an effectively floating exchange rate (IMF 2018a). Standard microprudential and macroprudential frameworks should continue to be strengthened to mitigate the procyclical buildup of systemic risk over the financial cycle. Meanwhile, the “macroprudential assessment framework for cross-border financing” that the Chinese government has developed since 2016 is more predictable and transparent compared with the previous capital flow management framework, and can be used to address risks arising from excessive cross-border financing and mismatches (including currency, maturity, and on/off balance sheet). Going forward, the liberalization of China's capital account should be gradual, carefully sequenced, and paced with supporting reforms that include an effective monetary policy framework, a sound financial system, reduced fiscal dominance, and more exchange rate flexibility (IMF 2018b).

ANNEX 16.1 STATISTICAL TABLES

Annex Table 16.1.1 reports the determinants of dollar bond issuance. The dependent variable is a dummy that equals 1 if a firm issues a dollar bond in year t , and 0 otherwise. The analysis controls for firms' revenue growth, Tobin's Q (market value divided by book value), leverage, and return on assets. It adds firm fixed effects and year fixed effects in the first column. In columns (2) through (7), it replaces the time fixed effect with the interest rate spread, the renminbi-dollar bilateral exchange rate, the carry trade index, the Economic Policy Uncertainty Index, the Chinese (CNY) bond yield dispersion, and the Chicago Board Options Exchange Volatility Index (VIX), respectively. The interest rate spread between China and the United States is calculated by the China 5-year government bond yield minus the US 5-year Treasury bond yield. The renminbi-dollar rate is the annual average onshore CNY rate. The carry trade index is the interest rate spread scaled by implied foreign exchange volatility, as in Bruno and Shin (2017). The Economic Policy Uncertainty Index is developed by Baker, Bloom, and Davis (2016) to serve as a proxy for movements in policy-related economic uncertainty in China. The CNY bond yield dispersion is the standard deviation of CNY-denominated bond yield. The VIX is the year average VIX.

ANNEX TABLE 16.1.1.

Determinants of Offshore US Dollar Bond Issuance							
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
External financial dependence	-0.033*** (-3.128)	-0.032*** (-3.104)	-0.032*** (-3.030)	-0.032*** (-3.053)	-0.039*** (-6.042)	-0.040*** (-6.158)	-0.032*** (-7.096)
Revenue growth	-0.000 (-0.195)	-0.001 (-0.552)	-0.002 (-0.861)	-0.002 (-0.929)	-0.001 (-0.326)	0.001 (0.280)	-0.001 (-0.748)
Tobin's Q	-0.139 (-0.887)	-0.064 (-0.668)	0.002 (0.019)	-0.005 (-0.057)	0.286 (1.424)	0.078 (0.342)	0.066 (0.489)
Leverage	0.007*** (2.913)	0.007*** (3.009)	0.007*** (3.113)	0.007*** (3.038)	0.004* (1.851)	0.004* (1.775)	0.007*** (5.474)
Return on assets	0.010*** (2.903)	0.009*** (2.676)	0.008** (2.129)	0.010*** (2.891)	0.016* (1.886)	0.018** (2.107)	0.012** (2.539)
Interest spread		0.162*** (6.226)					
Foreign exchange rate			-0.770*** (-5.578)				
Carry Trade Index				0.011*** (5.721)			
Economic Policy Uncertainty Index					-0.002*** (-2.663)		
CNY bond yield dispersion						-0.455 (-1.114)	
Chicago Board Options Exchange Volatility Index							-0.054*** (-5.871)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	No	No	No	No	No	No
No. of observations	22,545	22,545	22,545	22,545	14,583	14,583	22,545
R ²	0.008	0.008	0.006	0.007	0.004	0.004	0.006

Source: Authors' calculations.

Note: Robust t-statistics appear in parentheses. Tobin's Q represents market value divided by book value. CNY = Chinese yuan.

*** $p < .01$; ** $p < .05$; * $p < .1$.

ANNEX TABLE 16.1.2

Offshore Dollar Bond Issuance and Capital Expenditure								
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent Variable: Capital Expenditure							
US\$ issuer	-10.11 *** (-2.84)	-8.41** (-2.48)	-8.79** (-2.51)	-8.72** (-2.49)	-8.96** (-2.57)	-9.52*** (-2.77)	-9.81*** (-2.85)	-6.33** (-2.13)
Revenue growth			0.27*** (21.10)	0.27*** (20.85)	0.26*** (20.83)	0.24*** (18.63)	0.24*** (18.58)	0.23*** (23.99)
Tobin's Q				1.62* (1.93)	1.86** (2.20)	1.57* (1.94)	1.55* (1.92)	-0.09 (-0.18)
Leverage					0.01* (1.94)	0.03*** (3.56)	0.03*** (3.59)	0.02*** (5.20)
Return on assets						0.28*** (10.07)	0.28*** (10.08)	0.18*** (8.46)
External financial dependence							-0.04* (-1.82)	-0.06*** (-2.59)
Lag capital expenditures								0.18*** (20.28)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	22,566	22,566	22,543	22,543	22,543	22,543	22,543	19,494
R ²	0.00	0.04	0.09	0.09	0.09	0.10	0.10	System GMM

Source: Authors' calculations.

Note: Robust *t*-statistics appear in parentheses. Tobin's Q represents market value divided by book value. GMM = generalized method of moments.

****p* < .01; ***p* < .05; **p* < .1.

ANNEX TABLE 16.1.3

Offshore US Dollar Bond Issuance and Inventory Investment								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Dependent Variable: Inventory Investment							
US\$ issuer	-11.07*** (-3.64)	-6.74** (-2.53)	-7.32*** (-2.89)	-7.23*** (-2.87)	-7.65*** (-3.03)	-8.19*** (-3.27)	-8.33*** (-3.32)	-5.70* (-1.68)
Revenue growth			0.37*** (26.32)	0.37*** (26.11)	0.37*** (25.96)	0.34*** (23.96)	0.34*** (23.93)	0.30*** (27.14)
Tobin's Q				1.86** (2.25)	2.28*** (2.73)	2.06** (2.52)	2.05** (2.51)	-0.33 (-0.55)
Leverage					0.02*** (3.24)	0.04*** (4.75)	0.04*** (4.76)	0.04*** (7.53)
Return on assets						0.26*** (8.28)	0.26*** (8.29)	0.27*** (10.61)
External financial dependence							-0.02 (-0.80)	-0.03 (-1.17)
Lag capital expenditures								-0.02** (-2.02)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	22,188	22,188	22,177	22,177	22,177	22,177	22,177	19,135
R ²	0.00	0.07	0.14	0.14	0.14	0.15	0.15	System GMM

Source: Authors' calculations.

Note: Robust t-statistics appear in parentheses. Tobin's Q represents market value divided by book value. GMM = generalized method of moments.

*** $p < .01$; ** $p < .05$; * $p < .1$.

ANNEX TABLE 16.1.4

Extensive and Intensive Margin of Offshore US Dollar Bond Issuer and Capital Expenditure								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Dependent Variable: Capital Expenditure							
US\$ issuer	-9.76** (-2.31)	-7.62* (-1.86)	-7.40* (-1.76)	-7.25* (-1.73)	-7.60* (-1.82)	-8.13** (-1.98)	-8.46** (-2.05)	-4.46 (-1.39)
US\$ outstanding	-0.01 (-0.22)	-0.02 (-0.53)	-0.03 (-0.85)	-0.03 (-0.90)	-0.03 (-0.84)	-0.03 (-0.89)	-0.03 (-0.86)	-0.02 (-0.46)
Revenue growth			0.27*** (21.09)	0.27*** (20.85)	0.26*** (20.83)	0.24*** (18.62)	0.24*** (18.57)	0.22*** (14.39)
Tobin's Q				1.63* (1.94)	1.87** (2.21)	1.58* (1.95)	1.56* (1.93)	0.59 (0.85)
Leverage					0.01* (1.93)	0.03*** (3.54)	0.03*** (3.58)	0.02*** (4.40)
Return on assets						0.28*** (10.06)	0.28*** (10.08)	0.19*** (6.80)
External financial dependence							-0.04* (-1.81)	-0.06*** (-2.58)
Lag capital expenditures								0.15*** (11.01)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	22,566	22,566	22,543	22,543	22,543	22,543	22,543	19,494
R ²	0.00	0.04	0.09	0.09	0.09	0.10	0.10	

Source: Authors' calculations.

Note: Robust *t*-statistics appear in parentheses. Tobin's Q represents market value divided by book value.

****p* < .01; ***p* < .05; **p* < .1.

ANNEX TABLE 16.1.5

Extensive and Intensive Margin of Offshore Dollar Bond Issuer and Inventory Investment								
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent Variable: Inventory Investment							
US\$ issuer	-16.06*** (-4.69)	-10.53*** (-3.45)	-10.35*** (-3.26)	-10.16*** (-3.20)	-10.78*** (-3.43)	-11.29*** (-3.65)	-11.46*** (-3.70)	-5.12 (-1.41)
US\$ outstanding	0.10** (2.57)	0.08** (1.98)	0.06 (1.42)	0.06 (1.37)	0.06 (1.48)	0.06 (1.46)	0.06 (1.47)	0.02 (0.29)
Revenue growth			0.37*** (26.32)	0.37*** (26.11)	0.37*** (25.96)	0.34*** (23.96)	0.34*** (23.93)	0.28*** (16.61)
Tobin's Q				1.84** (2.22)	2.26*** (2.71)	2.04** (2.50)	2.03** (2.49)	1.75** (2.20)
Leverage					0.02*** (3.27)	0.04*** (4.79)	0.04*** (4.80)	0.04*** (6.77)
Return on assets						0.26*** (8.27)	0.26*** (8.29)	0.25*** (7.45)
External financial dependence							-0.02 (-0.82)	-0.02 (-0.93)
Lag capital expenditures								0.02 (1.60)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	2,790	22,566	22,543	22,543	22,543	22,543	22,543	19,494
R ²	0.00	0.04	0.09	0.09	0.09	0.10	0.10	

Source: Authors' calculations.

Note: Robust *t*-statistics appear in parentheses. Tobin's Q = market value divided by book value.

****p* < .01; ***p* < .05; **p* < .1.

ANNEX TABLE 16.1.6

Sensitivity of Investment to External Financial Dependence: Sectoral Impact						
	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: Capital Expenditure			Dependent Variable: Inventory Investment		
Variables	State-Owned			State-Owned		
	Enterprise	Real Economy	Oil	Enterprise	Real Economy	Oil
US\$	-9.196 (-1.434)	-7.355 *** (-2.881)	-10.837 *** (-2.971)	-5.735 (-1.315)	-9.607 *** (-3.435)	-7.102 *** (-2.815)
US\$ × External Financial Dependence	0.163 (1.558)	0.039 (0.635)	0.138 (1.564)	-0.018 (-0.060)	-0.179 (-1.225)	-0.044 (-0.222)
US\$ × Sector	9.293 (0.980)	-4.243 (-0.498)	-3.792 (-0.263)	0.394 (0.051)	3.218 (0.620)	-13.104 (-1.421)
External Financial Dependence × Sector	-0.047 (-0.945)	-0.267*** (-5.546)	0.240 (1.183)	-0.148*** (-3.104)	0.112 (1.103)	-0.053 (-0.917)
US\$ × External Financial Dependence × Sector	-0.481*** (-3.778)	0.291** (2.211)	1.404 (0.979)	-0.274 (-0.753)	0.896** (2.059)	-0.193 (-0.763)
Revenue growth	0.239*** (14.512)	0.239*** (18.574)	0.239*** (18.575)	0.320*** (16.392)	0.340*** (23.774)	0.340*** (23.773)
Tobin's Q	-0.203 (-0.190)	1.504* (1.857)	1.575* (1.947)	0.857 (0.835)	1.743** (2.144)	1.695** (2.082)
Leverage	0.022** (2.065)	0.026*** (3.572)	0.026*** (3.588)	0.033*** (3.291)	0.035*** (4.713)	0.035*** (4.704)
Return on assets	0.286*** (7.916)	0.280*** (10.133)	0.278*** (10.083)	0.261*** (6.261)	0.258*** (8.021)	0.258*** (8.026)
External financial dependence	0.017 (0.486)	0.020 (1.010)	-0.050** (-2.560)	-0.138*** (-4.197)	-0.222*** (-12.656)	-0.216*** (-12.035)
Constant	19.523*** (10.660)	15.188*** (11.665)	15.096*** (11.596)	14.353*** (7.107)	13.244*** (9.296)	13.311*** (9.296)
No. of observations	12,987	22,543	22,543	12,698	22,177	22,177
R ²	0.113	0.102	0.101	0.152	0.157	0.157

Source: Authors' calculations.

Note: Robust t-statistics appear in parentheses. Tobin's Q represents market value divided by book value.

***p < 0.01; **p < 0.05; *p < 0.1.

ANNEX TABLE 16.1.7

Dollar Bond Redemptions and Corporate Investment						
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Dependent Variable: Capital Expenditure			Dependent Variable: Inventory Investment		
US dollar redemption dummy	-12.47*** (-3.21)		-0.02 (-0.00)	-8.77 (-1.19)		9.29 (0.92)
US dollar redemption/total debt		-2.36*** (-3.61)	-2.36* (-1.83)		-1.84 (-1.38)	-3.42 (-1.57)
Revenue growth	0.24*** (17.99)	0.24*** (17.99)	0.24*** (17.99)	0.35*** (23.89)	0.35*** (23.89)	0.35*** (23.89)
Tobin's Q	1.46* (1.75)	1.46* (1.74)	1.46* (1.74)	2.09** (2.36)	2.09** (2.36)	2.09** (2.36)
Leverage	0.02*** (2.89)	0.02*** (2.88)	0.02*** (2.88)	0.03*** (4.55)	0.03*** (4.55)	0.03*** (4.54)
Return on assets	0.31*** (10.60)	0.31*** (10.61)	0.31*** (10.60)	0.28*** (8.23)	0.28*** (8.23)	0.28*** (8.23)
External financial dependence	-0.03 (-1.49)	-0.03 (-1.49)	-0.03 (-1.49)	-0.01 (-0.62)	-0.01 (-0.61)	-0.01 (-0.62)
Firm fixed effects	Y	Y	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y	Y
No. of observations	20,896	20,896	20,896	20,688	20,688	20,688
R ²	0.11	0.11	0.11	0.16	0.16	0.16

Source: Authors' calculations.

Note: Robust t-statistics appear in parentheses. Tobin's Q represents market value divided by book value.

*** $p < .01$; ** $p < .05$; * $p < .1$.

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Glossary

Approval-based regulation Regulations under which entities must seek explicit approval from relevant authorities before issuing bonds.

See also **registration-based regulation**.

Asset-backed note A type of asset-backed security issued by nonfinancial companies in the **China Interbank Bond Market (CIBM)**. These securities are regulated by the **National Association of Financial Market Institutional Investors (NAFMII)**. The underlying assets of asset-backed notes are used as collateral and may be securitized.

Bankruptcy remoteness The status of an entity, such as a special purpose vehicle, formed to develop, own, and operate a special project while isolating and minimizing bankruptcy risk. The corresponding entity's assets and obligations are usually limited to those necessary for development and operation of the designated project.

See also **special purpose vehicle**.

Belt and Road Initiative An initiative proposed by President XI Jinping in 2013. Although the name refers to ancient trade routes, the initiative transcends trade and encompasses five areas to advance the initiative: (1) policy coordination, (2) facilities connectivity, (3) unimpeded trade, (4) financial connectivity, and (5) people-to-people bonds.

Benchmark rate The reference rate set by the People's Bank of China to guide the bank loan and deposit interest rates of commercial banks. The policy rate is set with the approval of the State Council. After interest rate liberalization, the lower limit on bank lending rates was formally removed in July 2013, and the upper limit on bank deposit rates was eliminated in October 2015.

Block trade Also known as a *block order*, this is an order or trade submitted for the sale or purchase of a large number of securities. A block trade involves many equities or bonds traded at an arranged price between two parties, sometimes outside the open market, to lessen the effect on the security price.

See <https://www.investopedia.com/terms/b/blocktrade.asp> for additional information.

The glossary draws on individual chapters and input from the Chinese authorities, as well as information in the public domain, including content.next.westlaw.com, cop23.com.fj, en.wikipedia.org, english.shclearing.com, new.chinamoney.com.cn, www.cboe.com, www.climatebonds.net, www.icmagroup.org, www.idfc.org, www.imf.org, www.investopedia.com, www.isda.org, www.jpmorgan.com, www.nafmii.org.cn, www.risk.net, and www.yieldbook.com.

Bloomberg Barclays Global Aggregate Index A widely tracked global fixed income index that measures the performance of bonds in 24 local currency markets. It is a multicurrency benchmark and includes Treasury, quasi-sovereign, corporate, and securitized fixed-rate bonds. China government and policy bank bonds are included as of April 2019.

Bond Connect A pilot program that connects **China's interbank bond market (CIBM)** with the world through a link between the mainland China and Hong Kong SAR market infrastructures. Under Bond Connect, foreign investors do not have to open accounts in mainland China to hold their CIBM bonds. These bonds can instead be held by foreign investors through their global custodian through the **Central Moneymarkets Unit**. Bond Connect includes two types of trading: northbound gives international investors access to the CIBM and began July 3, 2017. Southbound trading, which will allow mainland investors to trade in major overseas over-the-counter bond markets, will be explored at a later stage.

Bond settlement agent Someone who acts on behalf of a client to settle bond trading according to the instructions of the client.

Capital flow management measures Procedures designed under the IMF's institutional view on the liberalization and management of capital flows that limit capital flows and encompass measures that discriminate both based on residency and those that do not.

See <http://www.imf.org/external/np/g20/pdf/2018/073018.pdf> for additional information.

Carry trade A strategy through which an investor borrows money at a low interest rate (typically with a short maturity) to finance the purchase of an asset that is expected to provide a higher return. A popular carry trade strategy in China before 2015 was to borrow in US dollars and lend in renminbi through bond repurchases (repos) or by investing in rates bonds (bonds with no or very low default risk). The return comes from both the positive interest rate spread and renminbi appreciation.

Central Moneymarkets Unit A centralized bond depository facility operated by the Hong Kong Monetary Authority (HKMA). It was launched in 1990 to provide clearing, settlement, and custodian services for Exchange Fund Bills and Notes (Hong Kong dollar debt securities) issued by the HKMA. The unit later expanded to cover bonds issued by the Hong Kong SAR government and debt securities issued by both public and private sector entities. In 1996, the Central Moneymarkets Unit extended its clearing and custodian services to cover debt securities denominated in foreign currencies and established a link with the Hong Kong dollar real time gross settlement system.

Chengtou bond A bond issued by a kind of state-owned enterprise, a local government financing vehicle (LGFV). LGFVs are established by local governments with capital, land, and other public resources. Bonds issued by LGFVs are usually known as urban construction bonds, or *chengtou* bonds in Chinese. Although there is no particular regulatory definition of *chengtou*, it is widely used by market participants and is, as such, classified by the China Securities Index and included in Wind databases.

China Central Depository and Clearing (CCDC) A wholly state-owned financial institution approved and funded by the State Council of China. It is an essential national financial market infrastructure that provides central registration, depository, and settlement services. The CCDC is regulated by the People's Bank of China, Ministry of Finance, and China Bank and Insurance Regulatory Commission. It is one of the three institutions that make up the Central Securities Depository and Securities Settlement System. The other two are the **Shanghai Clearing House** and the China Securities Depository and Clearing Corporation.

China Foreign Exchange Trade System (CFETS) Also known as the National Interbank Funding Center, an institution directly affiliated with the People's Bank of China (PBC). It provides a series of services covering issuance, trade, post-trade processing, information, benchmark, and training services for the interbank foreign exchange market, money market, and bond market online and via a dedicated line through advanced electronic information technology. CFETS monitors market transactions daily and provides support and service for the PBC and self-regulated market organizations. CFETS publishes market benchmarks, including the renminbi central parity rate, Shanghai interbank offered rate (SHIBOR), CFETS renminbi index, loan prime rate, renminbi reference rate, bond indices, yield curves, and other information offering reference prices for the market.

See <http://new.chinamoney.com.cn/english/ausbid/> for additional information.

China government bond (CGB) A Treasury bond issued by the Ministry of Finance.

China interbank bond market (CIBM) Introduced by the People's Bank of China in 1997 and the largest fixed income market in China, accounting for more than 90 percent of all bond issuance and trading activities. It is an over-the-counter market and operates independently of the Shanghai and Shenzhen exchange bond markets. Many foreign financial institutions are able to invest in China's domestic interbank bond market.

See also **National Association of Financial Market Institutional Investors (NAFMII)**.

Citigroup World Government Bond Index (WGBI) Now called the FTSE World Government Bond Index. On August 31, 2017, the London Stock

Exchange Group (LSEG) acquired The Yield Book and Citi Fixed Income Indices businesses from Citi.

See **FTSE World Government Bond Index**.

Climate Bonds Initiative An investor-focused, not-for-profit international organization working solely to mobilize the international bond market for climate change solutions by promoting investment in projects and assets necessary for a rapid transition to a low-carbon and climate-resilient economy.

See <https://www.climatebonds.net/>.

Close-out netting A technique used to determine the net obligations of a defaulted counterparty to a derivative or repo transaction. The counterparty's remaining contractual obligations are terminated, and the final positive and negative replacement values of its positions are combined into a single net payable or receivable. Several countries have carve-outs from their bankruptcy laws to allow for close-out netting. Without them, insolvency administrators could immediately trigger contracts under which the defaulted party is owed money but that would require counterparties with opposite contracts to get in line with other creditors. This could take years to resolve and result in a smaller payout.

See <https://www.risk.net/definition/close-out-netting/>.

CNH forward The deliverable forward exchange rate of the renminbi against the US dollar quoted in the offshore market, mostly in Hong Kong SAR. Like other currency forwards, the term of the liquid CNH forward ranges from overnight to 12 months.

Collateralized loan obligation A form of securitization in which portfolios of loans are securitized and managed as a fund. Each is structured as a series of tranches of interest-paying bonds, along with a small portion of equity.

Collective investment scheme Also known as a collective investment trust, a fund operated by a bank, security house, or trust company that manages a group of pooled trust accounts. These funds group assets from individuals and organizations to develop a larger, diversified portfolio.

Commercial paper A short-term debt instrument issued by nonfinancial firms registered with the **National Association of Financial Market Institutional Investors (NAFMII)** in accordance with the Guidelines on Interbank Bond Market Non-financial Firms Financial Tools. It is traded on the interbank bond market. Typical maturities are 3, 6, 9, and 12 months.

Corporate bond A type of credit bond issued by nonfinancial firms in China and regulated by the China Securities Regulatory Commission according to the Securities Law and the Guidelines on Corporate Issuance and Trading and traded on the exchange market only.

See also **enterprise bonds** and **medium-term notes**.

Covered bond A debt security issued by a financial institution and backed by a separate group of assets; if the financial institution becomes insolvent, the bondholders have recourse to the collateral. Covered bonds provide an efficient, lower-cost way for lenders to expand their business rather than issuing unsecured debt instruments.

See <https://www.investopedia.com/terms/c/coveredbond.asp> for additional information.

Credit asset-backed security A security issued by financial institutions such as banks, automobile financing companies, consumer financing companies, and financial leasing companies in the Chinese interbank market. Usually, the underlying assets are, for example, loans extended by the initiating financial institutions. Their issuance is regulated by the People's Bank of China. Issuers must register with the China Banking and Insurance Regulatory Commission.

Credit bond A bond issued without collateral by nonfinancial enterprises. In China, credit bonds comprise enterprise bonds, corporate bonds, medium-term notes, and other nonfinancial enterprise debt-financing instruments.

Credit default swap (CDS) A financial swap agreement under which the seller of the CDS will compensate the buyer in the event of a debt default (by the debtor) or other credit event. The seller insures the buyer against the default of a particular reference asset. The buyer makes a series of payments (the CDS "fee" or "spread") to the seller and, in exchange, may expect to receive a payoff if the asset defaults. In China, credit default swaps were launched in October 2016. Default events can be either security defaults or issuer defaults.

See https://en.wikipedia.org/wiki/Credit_default_swap for additional information.

Credit-linked note A note that can be regarded as a credit default swap with cash collateral. The credit risk bearer first sets up a **special purpose vehicle (SPV)**, and the two parties enter a credit-default-swap-style contract. The SPV then issues credit-linked notes to other investors. Investors purchase the credit-linked notes by paying the face-value principal and receive interest payments. When certain credit default events take place before credit-linked notes mature, the SPV pays the credit risk bearer according to a credit-default-swap-style contract and then pays back the credit-linked note principal with residual net value. Otherwise, the full amount of principal is repaid. In China, credit-linked notes were launched in October 2016. A default event can be either a bond default or a default by the issuer, or both.

Credit risk mitigation agreement A credit-default-swap-style contract in which one party pays a fee in exchange for another party paying a certain amount

of money when a specified credit default event takes place. In China, the agreements were launched in October 2010. Before October 2016, a credit-risk-mitigation agreement could cover only default events of bonds, not issuers.

Credit risk mitigation warrant A credit-default-swap-style security in which the issuer pays a fee in return for investors' payment when certain credit default events take place. In China, the warrants were launched in October 2010. Before October 2016, a credit-risk-mitigation warrant could cover only default events of bonds, not issuers.

Cross-currency swap Over-the-counter derivatives in the form of an agreement between two parties to exchange interest payments and principal denominated in two different currencies.

Debt-equity swap A transaction in which the obligations or debts of a company or individual are exchanged for equity. In China, this often involves creditors (banks) converting nonperforming corporate loans into equity holdings.

Debt financing instrument of nonfinancial enterprise A marketable security issued by an incorporated nonfinancial enterprise, traded on the interbank bond market, registered with the National Association of Financial Market Institutional Investors under the People's Bank of China. These instruments conform to the Guidelines on Interbank Bond Market Non-financial Firms Financial Tools, including commercial paper, medium-term notes, private placement notes, and so on.

Delivery versus payment settlement A settlement procedure in securities trading. It stipulates that payments must be made before or at the same time as delivery of securities. The delivery versus payment procedure aims to eliminate counterparty risk.

Dim sum bond A renminbi bond issued outside mainland China. The term comes from "dim sum," a popular style of cuisine in Hong Kong SAR. The first dim sum bond was issued by the China Development Bank in July 2007, with face value of RMB 5 billion and a term of two years. In 2010, McDonald's was the first foreign company to issue a dim sum bond, with a face value of RMB 200 million and a three-year maturity.

Double-taxation treaty Usually refers to agreements (typically between two countries) for the avoidance of double taxation and the prevention of fiscal evasion with respect to taxes on income and capital.

DR007 A weighted seven-day interbank pledged repo rate covering deposit institutions. Although the People's Bank of China has not confirmed DR007 as

the policy interest rate yet, it is closely watched by the market to determine inter-bank liquidity.

Enterprise asset-backed security Issued by nonfinancial firms or financial institutions on the exchange market in Shenzhen or Shanghai and regulated by the China Securities Regulatory Commission. Only qualified investors may invest in enterprise asset-backed securities.

Enterprise bond A type of credit bond issued by nonfinancial firms in China. They are regulated by the National Development and Reform Commission and traded on both the China interbank and the exchange bond markets. The market is almost exclusively for state-owned enterprises.

See also **corporate bond** and **medium-term notes**.

Entrusted investment fund An investment fund outsourced by some small banks that lack expertise. These banks outsource their investment fund to a mutual fund or security house for management under their investment guidance.

Exchange bond market A market in which individual and small and medium-size institutional investors carry out trading through a concentrated match-making method on the exchanges. The exchange market in China includes the Shanghai Stock Exchange and the Shenzhen Stock Exchange.

Exchange-for-physical (EFP) A transaction between two parties in which a futures contract on a commodity is exchanged for the actual physical good. This transaction involves a privately negotiated exchange of a futures position for a corresponding position in the underlying physical good.

See https://en.wikipedia.org/wiki/Exchange_of_futures_for_physicals for additional information.

Exchange-for-swap (EFS) A transaction negotiated privately in which a futures contract for a physical item is exchanged for a cash-settled swap contract. It is similar to an exchange-for-physical, except that it involves a cash contract rather than a physical goods contract.

See https://en.wikipedia.org/wiki/Exchange_of_futures_for_swaps for additional information.

Exchange-traded fund (ETF) A marketable security that tracks a stock, commodity, or bond index or other baskets of assets.

Federal and unitary countries A federal system—as in Canada, Germany, and the United States—that shares power between the federal government and the states or provinces. It refers to a political entity characterized by a union of partially self-governing provinces, states, or other regions under a central federal

government (federalism). A unitary system of government (or unitary state) is a sovereign state governed as a single entity. The central government delegates different degrees of power to the administrative divisions. Examples include China, Japan, Korea, Sweden, and the United Kingdom.

Financial bond A bond issued by a financial institution. These can be policy bank bonds and commercial financial bonds. Financial bonds are issued both on the China interbank market and on the exchange markets and are regulated by the People's Bank of China, China Banking and Insurance Regulatory Commission, and China Securities Regulatory Commission.

Financial cycle The cyclical rise and fall of key factors influencing financial markets, such as asset prices and volatility; leverage, credit availability; and investors' risk appetite, expectations, and confidence. Compared with business cycles, financial cycles tend to be longer (5–20 years), with a median length of about 15 years. They tend to be longer in liberalized, developed markets than in emerging markets.

Foreign exchange and interest rate derivative A kind of security whose price or income depends on the underlying price of certain exchange rates or interest rates. Common foreign exchange and interest rate derivatives include forwards, futures, options, and swaps.

Forward rate agreement An over-the-counter contract between parties that determine the rate of interest or the currency exchange rate to be paid or received on an obligation beginning at a future start date. The forward rate agreement determines the rates to be used, along with the termination date and notional value.

FTSE World Government Bond Index (WGBI) A widely followed fixed income index that measures the performance of local-currency-denominated, fixed-rate, and investment-grade-rated sovereign bonds in more than 20 countries. See also **Citigroup World Government Bond Index (WGBI)**. See <https://www.yieldbook.com/m/indices/single.shtml?ticker=WGBI> for additional information.

GARCH and EGARCH A generalized autoregressive conditional heteroskedasticity model that is a statistical model for time series data and describes the variance of the current error term as an autoregressive moving average model of the previous time periods' error terms. EGARCH refers to an exponential generalized autoregressive conditional heteroskedasticity model. The GARCH model imposes nonnegativity constraints on the parameters of the error term function, but there is no such restriction on the EGARCH model proposed by Daniel B. Nelson, in which the conditional variance is an asymmetric function of lagged error terms.

Global custodian bank A bank that provide custodial services in various countries to support holding and trading of securities by clients. Custodians are specialized financial institutions that safeguard the assets of clients, arrange or facilitate settlements, and collect information on incomes.

Government guided fund A fund supplied by a mixture of budgetary (junior tranche) and nonbudgetary (debt-like senior tranche delivering a steady return) contributions typically by state-owned enterprises, local government financing vehicles, banks, and other financial institutions.

Granger causality A statistical technique to determine whether a time series can be statistically predicted by previous observations of another time series. See https://en.wikipedia.org/wiki/Granger_causality for additional information.

Green bond A bond issued to finance projects with potential environmental protection and climate change mitigation benefits. Because there is no unified definition of green bonds across countries, a third party usually verifies whether a bond qualifies as a green bond. For example, nuclear energy is not considered green in some eastern European countries, but most economies agree that solar and wind energy are green.

Green covered bond A bond with a dual recourse structure that is issued by a bank. If the issuing bank defaults, investors are covered by a dedicated pool of assets, such as renewable energy power plants.

Huber-White sandwich estimator An estimation technique that allows heteroskedastic residuals. Basic regression and time series models assume that the error term has the same variance across all observations. When this assumption does not hold, the errors are said to be heteroskedastic, and the estimates are inconsistent and biased in nonlinear models. Huber-White sandwich estimators are used to allow the fitting of a model that does contain heteroskedastic residuals.

Inflation targeting A monetary policy regime in which a central bank has an explicit target inflation rate for the medium term and announces this target to the public.

Insurance asset-backed plan A plan issued by financial companies and regulated by the China Banking and Insurance Regulatory Commission. Only qualified investors may invest.

Interest rate swap (IRS) A kind of financial derivative that involves two parties exchanging the interest payments of two assets, usually of equal amount.

Intergovernmental relations An interacting network of institutions at the national and subnational (provincial and local) levels, set up and refined to enable the various parts of government to cohere in a manner appropriate to institutional arrangements. Intergovernmental relations comprise the processes and institutions through which governments within a political system interact. Analysis of these relations has traditionally focused on formal structure and institutions, in particular those linked with the financial arrangements among government levels.

International Capital Market Association (ICMA) A membership association headquartered in Switzerland, committed to serving the needs of its wide-ranging members, including private and public sector issuers, financial intermediaries, asset managers and other investors, capital market infrastructure providers, central banks, law firms, and others worldwide. It focuses on a comprehensive range of regulatory and market practice issues that affect all aspects of international market functioning. ICMA prioritizes four core areas: primary markets, secondary markets, repo and collateral markets, and green and social bond markets.

See <https://www.icmagroup.org/About-ICMA/> for additional information.

International Development Finance Club A membership association of development banks. It aims to promote more efficient global development. It was founded in 2011 and had 23 members as of July 2018.

See <https://www.idfc.org/> for additional information.

International Swaps and Derivatives Association An international organization ensuring the enforceability of netting and collateral provisions in derivatives trading. It has more than 900 member institutions from 70 countries, comprising a broad range of derivatives market participants.

See <https://www.isda.org/about-isda/> for additional information.

Investment vehicle A nonbank financial entity typically controlled by a third-party financial institution, typically a bank or trust company. In China, these vehicles are largely funded through the issuance of investment products, typically sold as high-yielding alternatives to bank deposits (for example, bank wealth management products) or customized packages of riskier loans (to other banks and institutional investors). They invest in various assets, such as bonds, bank deposits, and nonstandard credit assets, as well as in other investment products. These vehicles rely on short-term financing to use leverage and manage their maturity mismatches, and often benefit from implicit guarantees from their sponsoring financial institution.

See Chapter 1 of the IMF's April 2018 *Global Financial Stability Report* for more information.

ISDA Master Agreement A document agreed to internationally and published by the **International Swaps and Derivatives Association**, which is used to provide certain legal and credit protections for parties that enter into over-the-counter derivatives transactions.

JPMorgan Government Bond Index–Emerging Markets (GBI-EM) A group of indices covering local currency bonds issued by governments of emerging markets. It is provided by JPMorgan Chase.

See <https://www.jpmorgan.com/country/US/EN/jpmorgan/investbk/solutions/research/indices/product> for additional information.

Local government debt bond-swap program A three-year program the central government rolled out in 2015 to replace debt deemed to be the obligation of local governments—in the form of bank loans, **local government financing vehicle (LGFV)** bonds, trusts, and other nonstandard borrowing—with local government bonds. The RMB 18 trillion program was completed in 2018. It allowed local governments to restructure off-budget LGFV debt at lower interest rates and with longer maturities, on average.

Local government financing vehicle (LGFV) An economic entity (usually a corporation) with independent legal status set up by local governments to finance investment and urban development projects (*chengtou*). Local governments usually inject capital, land, or equities into LGFVs as initial capital. LGFVs then raise funding in the market or borrow from banks, often with implicit guarantees of the local governments.

London interbank offered rate (LIBOR) A benchmark rate that represents the interest rate at which banks offer to lend funds to one another in the international interbank market for short-term loans. LIBOR is an average value of the interest rate, which is calculated from estimates submitted by the leading global banks on a daily basis.

See <https://www.investopedia.com/terms/l/libor.asp> for additional information. See also **Shanghai interbank offered rate (SHIBOR)**.

M2 A monetary aggregate including currency in circulation, demand deposits, time deposits, savings deposits, and other deposits. Until 2018, China had a quantitative annual M2 target/forecast.

Medium-term lending facility (MLF) A monetary policy tool used by the People's Bank of China to provide medium-term liquidity to policy banks, development financial institutions, and commercial banks. It requires pledged government securities, highly rated bonds, or high-quality loans with three-month, six-month, or one-year maturities. It was introduced in September 2014.

Medium-term note A type of bond issued by nonfinancial firms, registered with the **National Association of Financial Market Institutional Investors (NAFMII)** in accordance with the Guidelines on Interbank Bond Market Non-financial Firms Financial Tools. These notes are traded on the Chinese interbank market. Typical maturities are three and five years. See also **enterprise bonds** and **corporate bonds**.

Multitier and single-tier custodian system A system under which custodians are divided into different tiers and ultimately centralized at one central depository (multitier). Custodians in each tier provide services that fit their own customer bases. Under a single-tier system, all investors must open accounts under their own names in the national clearing and settlement depository. Although the operational risk in a single-tier custodian system is low, the total cost of large quantities of settlements is rather high.

Mutual fund A professionally managed investment fund that pools money from many investors to purchase securities. These investors may be retail or institutional.

National Association of Financial Market Institutional Investors (NAFMII) An association that aims to propel the development of the over-the-counter financial market, which is composed of the interbank bond, interbank lending, foreign exchange, commercial paper, and gold markets. It was founded September 3, 2007, with the approval of the State Council of China. It is a self-regulatory organization whose members includes policy banks, commercial banks, credit cooperative banks, insurance companies, securities houses, fund management companies, trust and investment companies, finance companies affiliated with corporations, credit rating agencies, accounting firms, and companies in the nonfinancial sector.

See also **China interbank market (CIBM)**.

See http://www.nafmii.org.cn//english/aboutus_e/aboutnafmii_e/201202/t20120222_354.html for additional information.

NAFMII Master Agreement A document published by the National Association of Financial Market Institutional Investors that provides a uniform documentation approach for participants in the China interbank market involved in financial derivatives transactions.

Nominal effective exchange rate (NEER) A measure of the exchange value of a currency against a basket of foreign currencies, usually expressed as an index using values of bilateral trade in assigning the weights to foreign currencies.

Open interest Used in derivatives markets to refer to the number of outstanding derivatives contracts that have not been settled (also referred to as open commitments/contracts).

Open market operation (OMO) Trading conducted by a central bank with banks and other qualified institutions in its local currency to achieve goals such as keeping short-term interbank interest rates within a certain range through adjustment of liquidity in the banking system. An open market operation is a common tool used by central banks to influence liquidity in the financial system. In China, the People's Bank of China conducts open market operations, mainly through repurchase agreement (repo), reverse repo, and short-term liquidity operations.

Panda bond A bond denominated in renminbi by a non-Chinese issuer and issued in China's domestic bond market. The first panda bonds were issued in 2005 in the Chinese interbank bond market by two multilateral institutions, the Asian Development Bank and the International Finance Corporation.

Pledged supplementary lending (PSL) A lending facility through which the People's Bank of China provides long-term, stable, and properly priced loans for development, such as shantytown redevelopment projects and improved rural infrastructure. It also provides liquidity support for policy banks to extend credit to strategically important areas such as agriculture, water conservation, and green energy. These loans require highly rated bonds or high-quality loans as collateral.

Policy bank bond A bond issued by the China Development Bank, Export-Import Bank, or China Agricultural Development Bank.

Policy bank A state-owned financial institution in China responsible for implementing government economic policies. These comprise the China Development Bank, Export-Import Bank, and China Agricultural Development Bank. In 2015, the China Development Bank was designated by the State Council as a development finance institution, but it is still considered a policy bank by market participants.

Private placement note A type of credit bond issued by nonfinancial firms to selected qualified investors, registered with the **National Association of Financial Market Institutional Investors (NAFMII)** in accordance with the Guidelines on Interbank Bond Market Non-financial Firms Financial Tools, and traded on the interbank bond market.

Qualified Foreign Institutional Investor (QFII) A program that allows foreign institutional investors to use foreign currency funds to invest in China's domestic capital market. The QFII program was introduced in 2002 by the China Securities Regulatory Commission. Foreign investment in China is subject to a quota system governed by the China State Administration of Foreign Exchange.

Real estate investment trust (REIT) A company that owns, operates, or finances income-producing real estate. REITs give each investor either a percentage interest in a property or an interest in a loan secured by a mortgage or deed of trust on a property. REITs often trade on major exchanges in the same way as other securities and give investors a liquid stake in an array of real estate assets.

Registration-based regulation Regulation under which an economic entity must register with relevant authorities only information related to the business it hopes to conduct without seeking approval. If a certain bond issuance is regulated on a registration basis, firms need submit only the relevant information to the regulating agencies before issuing the bonds. They do not have to wait for approval documents.

See also **approval-based regulation**.

Repo A repurchase agreement that is a form of collateralized borrowing in which the borrowing party sells a security and enters into a forward purchase agreement to repurchase the security at a later date. The interest rate is often determined by the relative price of the security in the first and second transactions.

See <https://www.investopedia.com/terms/r/repurchaseagreement.asp> for additional information.

Reserve requirement The minimum amount of reserves commercial banks must hold, usually in the form of a percentage of deposits.

RMB Qualified Foreign Institutional Investor (RQFII) A program that allows foreign investors to use renminbi-denominated funds raised outside mainland China to invest in China's domestic capital markets. The RQFII program was initiated in late 2011. RQFII investment licenses are approved by the China Securities Regulatory Commission, and the investment quota is determined by the State Administration of Foreign Exchange.

Shanghai Clearing House (SHCH) A qualified central counterparty accepted by the People's Bank of China and one of the central securities depositories in China. Established November 28, 2009, the SHCH is an important financial market infrastructure in China.

See <http://english.shclearing.com/aboutus/companyProfile/?xyz=0.5502678016970497> for additional information.

Shanghai interbank offered rate (SHIBOR) A daily reference rate based on the interest rates at which banks offer to lend unsecured funds to other banks in the Shanghai interbank money market. See also **London interbank offered rate (LIBOR)**.

Short-term liquidity operation (SLO) An open market operation tool of the People's Bank of China to manage the money supply. Short-term liquidity operations are conducted mainly through repurchase agreements (or reverse repurchase agreements) with large banks in China.

Special construction funds Public investment funds entirely funded by policy banks.

Special drawing right (SDR) An international reserve asset introduced by the IMF in 1969 to supplement its member countries' official reserves. To date, SDR 204.2 billion (equivalent to about US\$291 billion) has been allocated to members, including SDR 182.6 billion allocated in 2009 in the wake of the global financial crisis. The value of the SDR is based on a basket of five currencies—the US dollar, the euro, the Chinese renminbi, the Japanese yen, and the British pound sterling.

See <https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/14/51/Special-Drawing-Right-SDR> for additional information.

Special purpose vehicle (SPV) A bankruptcy-remote entity that a parent company uses to isolate or securitize assets. It often holds these assets off its balance sheet. An SPV makes a subsidiary company's obligations secure even if its parent company goes bankrupt. Sometimes an SPV is designed to serve as a counterparty for swaps and other credit-sensitive derivative instruments. See also **Bankruptcy remoteness**.

Standard lending facility A liquidity supply channel of the People's Bank of China to meet temporary liquidity demands of commercial banks and rural cooperative financial institutions. It is considered the upper bound of the interest corridor. It was introduced in early 2013. The maturities are overnight, seven days, and one month.

State Administration of Foreign Exchange (SAFE) A deputy-ministerial-level state administration responsible for foreign exchange administration in China, supervised by the People's Bank of China. SAFE headquarters are in Beijing, with branches and subbranches across the country.

Targeted medium-term lending facility (TMLF) A lending facility introduced December 2018 by the People's Bank of China as a monetary policy tool to provide long-term stable funding for financial institutions to expand their credit support to small and micro and private enterprises.

Total return swap A transaction that usually involves two parties. One party pays according to a predetermined funding rate, which can be either fixed or variable. The other party pays the total return of the underlying asset, including both interest and capital gains.

VIX An index computed by the Chicago Board Options Exchange. It measures market expectations of future stock market volatility based on option prices of the S&P 500 index. It is considered a gauge of risk-on or risk-off sentiment in the financial market.

See <http://www.cboe.com/vix> for additional information.

Window guidance An informal way for monetary and regulatory authorities to influence the behavior of banks and other financial institutions.

Yield curve Shows the relationship between interest rates and maturity. It usually puts maturity on the horizontal axis and the corresponding interest rates on the vertical axis. A shift or change in the shape of the yield curve over time can provide information on market expectations of the future movement of interest rates.

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