China’s Financial System and Economy: A Review

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Abstract

China’s financial system is an integral part of its spectacular economic growth over the past 40 years. We review the recent literature on China’s financial system and its connections to the Chinese economy based on the categories of aggregate financing to the real economy (AFRE), a broad measure of the nation’s yearly flow of liquidity that takes into consideration the unique features of the China’s financial system. While early work on Chinese stock markets and its bank sector emphasizes the state-owned enterprise (SOE) reform, the recent literature explores other more market-based financing channels—including shadow banking sectors—that have experienced rapid growth after 2010 and have become an important component of AFRE. We highlight that these new financing channels are not only intertwined with each other, but more importantly are often ultimately tied back to the dominant banking sector in China. Understanding the mechanisms behind these financial channels and their intrinsic connections is crucial to alleviate the distortion in capital allocation and to mitigate potential systemic financial risk in China.

Keywords: Economic reform; Development; Financial market; Fintech

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1 Introduction

China’s financial system, including its various markets as well as financial intermediaries, has served an essential role in China’s spectacular economic growth over the past four decades (Song et al., 2011), and is likely to become even more important in mobilizing capital across society in the next stage of China’s economic development. One may easily characterize China’s financial system—built around a colossal banking sector, an attention-grabbing stock market, a fast-growing bond market, and perhaps more importantly, an increasingly complex and multi-faceted shadow banking sector—as being large yet underdeveloped. This view is likely an oversimplification; as emphasized by Allen et al. (2005, 2019b), there are interesting and deep heterogeneities underneath China’s impressive financial market development, and we believe a thorough understanding of these questions has important implications in the much broader literatures of law, institutions, finance, and growth.

By reviewing the most recent academic articles on the topic of the Chinese financial system, this chapter aims to provide a comprehensive survey that offers insight in understanding its development as well as its connection to China’s tremendous growth. The majority of papers reviewed by this article have been published in leading academic journals and also widely cited among the academic community, though some are still circulating as working papers. More importantly, we focus on the literature that is up-to-date: 85% of the work dates from after 2005, and 64% from after 2015. To put it differently, we aim to provide a summary of intellectual reflections on the most recent developments of China’s financial system, which has undergone, and in fact is still undergoing, dramatic and structural changes in the past two decades.

Unlike many excellent review articles on similar topics in the literature Song and Xiong (2018); Allen et al. (2017, 2019a), we organize the content of this chapter based on the concept of aggregate financing to the real economy (社会融资规模, hereafter AFRE).1 As we will explain in Section 2, by taking into consideration the unique features of China’s financial system, AFRE is a broad measure of the nation’s yearly flow of liquidity, described by officials as “indicating total funds the real economy obtained from the financial system over a certain period of time.” (Elliott and Yan, 2013) Including bank credits, equity (stock) and bond issuances, as well as various shadow banking

1 Another widely used translation for AFRE is “total social financing,” or TFS; we following the official translation by the Chinese central bank.
items like Trust loans, AFRE is perhaps today’s most closely monitored and analyzed statistic released by the Chinese central bank for macroeconomic management. Although there are few academic works studying this concept in the preeminent western academic community (perhaps because it does not directly compare to figures reported by other countries), we believe that it is natural to follow the AFRE structure in organizing the existing literature on China’s financial system.

We provide a detailed explanation of the composition of AFRE in Section 2, and highlight the motivation behind the Chinese central bank’s move to introduce AFRE: Thanks to rapid developments in China’s financial system over the past two decades, especially since the 2009 four-trillion RMB stimulus program, traditional credit measures say the use of banks loans has become increasingly limited for reflecting the full size of financing to the real economy. This point is one of the recurring themes in this review article.

In Section 3, we move on to cover the stock market. Although equity issuance only accounted for 3% of AFRE by the end of 2021, the development of the stock market, i.e., the launch of exchanges in both Shanghai and Shenzhen in the early 1990s, marked the milestone event in the history of SOE reform. During that period, many Chinese SOEs conducted share issuance privatizations (SIPs). We emphasize, though, that China’s privatization program during the 1990s, as an essential step of the broader SOE reform program, differs fundamentally from western-style privatizations; Beijing, which never used the term “privatization” or “partial privatization,” introduced private investors to SOEs but never intended to transfer the state’s control to private investors. Put more directly, ultimate privatization is never the goal of the SOE reform, even for the significant stock-split share reform during 2005–2007, which converted all nontradable shares to tradable shares.

Beijing hoped these reform efforts could subject the corresponding SOEs to the discipline of the stock market, as in a well-functioning financial market the share prices would reflect information on managerial decisions and firm performance. The literature, however, questioned whether the role of market discipline was achieved by SIPs, which could just amount to a quotation on the stock market. As we review in Section 3.1, the answer is mixed, which is largely expected given the nature of the SIP program, let alone the underdeveloped legal and regulatory environment in China from around 2000 to 2005.
Section 4, which starts with a brief overview of the history of banking reform in China, reviews
the literature on the banking and shadow banking sectors in China; these two AFRE categories
together account for about 67% of AFRE by the end of 2021. We combine these two lines of
literature together because shadow banking in China, unlike that in other developed countries, can
always be traced back to its mammoth banking system; as put by Amstad and He (2019) “Chinese
shadow banking is literally just the ’shadow’ of commercial banks.” This is one of the two unique
features of the Chinese shadow banking sector; the other unique feature is the pervasive “implicit
guarantee.” (Zhu, 2016; Allen et al., 2021a). Most of articles reviewed in this section reflect these
two features.

The last important AFRE category is the bond market, which accounted for about 10% of
AFRE by the end of 2021. As shown in Amstad and He (2019), China has taken enormous strides
to develop its bond markets as an integral step of financial reforms, along with efforts to liberalize
interest rates and internationalize its currency. Our review focuses on two research topics. The first,
which is unique to China, is the coexistence of two well-developed but segmented bond markets;
and the second is corporate bonds, which have caught increasing attention due to the rising default
of corporate bonds in China since 2014. We highlight the intrinsic connections among the corporate
bond market, and the banking and shadow banking system.

Finally, we devote Section 6 separately to fintech development in China. Fintech, which has
played an important role when the shadow banking sector reached its last peak around 2017, is
not a part of the AFRE measure. Nevertheless, the rapid development and astonishing growth of
the fintech sector in China are truly remarkable. As we explain in Section 6, it is likely driven by
both underdeveloped traditional banking Chen (2016) and regulators’ unusually friendly approach
toward the burgeoning fintech industry in the early 2010s (Allen et al., 2019a). The section covers
a wide range of fintech topics, including fintech lending driven by big data technology, the broad
economic implications of fintech disruptions, and finally the rise and fall of peer-to-peer (P2P)
industry.

We emphasize that this review article does not aim to cover the complete literature on China’s
financial system. Political risk and corruption are two particular areas that have received significant
amount of attention given the nature of the Chinese economy, but have not been specifically covered
here (to name a few, Lin et al., 2016 and Liu et al., 2017). For instance, Liu et al. (2017) use the Bo
Xilai political scandal in 2012 as an exogenous shock to identify the impact of political uncertainty on asset prices. Though this line of research relies heavily on stock market data, the focus is more on political economy rather than financial markets.

2 Aggregate Financing to the Real Economy

Aggregate Financing to the Real Economy (社会融资规模, or AFRE), which is also known as “Total Social Financing,” was introduced by the People’s Bank of China (PBC, the Chinese central bank) in 2011 to reflect the magnitude of financial support from the entire financial system to the real economy. This section explains the underlying motivation as well as the detailed structure of the AFRE measure, based on which we will organize the existing literature on Chinese financial system in this review article.

2.1 What is Aggregate Financing to the Real Economy?

As a broad credit measure, AFRE takes into consideration the unique features of China’s financial system. Without a clear international counterpart, this indicator is now closely monitored and analyzed for macroeconomic management and is also widely followed by the private sector and members of the general public who are keen on Chinese economy.

In short, AFRE refers to the total amount of financing that the real economy can access via the financial sector during a given period. As a “flow” measure, AFRE was first released on a quarterly basis in 2011, though the AFRE “level” data, defined as the outstanding stock of funding provided by the domestic financial system to the real economy at the end of the reference period, have been available since February 2015. Here, the real economy refers to nonfinancial corporations and households; and the financial system refers to the entire domestic financial system, covering financial institutions (commercial banks, security firms, and insurance companies, etc), security markets (bond and stock markets), and other intermediary markets (e.g., banks’ off-balance sheet items). To be more specific, AFRE includes

1. Bank loans in RMB and in foreign currencies; this is on the balance sheet of the formal banking system in China;
2. Trust loans, entrusted loans, and undiscounted bankers’ acceptances; they are off-balance sheet items closely connected to shadow banking activities in China;

3. Net issuance of corporate bonds and equity stocks in China’s domestic markets by nonfinancial enterprises; these items are often called market-based direct financing, as opposed to indirect financing which covers the first two categories; and

4. Other forms of financing, with the largest component being municipal bonds.

Categories 1 and 3, which cover bank loans and corporate bonds plus equity respectively, are common financing sources widely seen in other major economies. The level data shows that by 2021 bank loans accounted for 61.68% of AFRE, while the percentage numbers for corporate bonds and equity were 9.53% and 3.02%, respectively.

Category 2 is more unique to China. In short, trust loans (1.39% of AFRE level by 2021) are loans made by trust companies on behalf of individuals and institutional investors, while entrusted loans (3.46% of AFRE level by 2021) are firm-to-firm loans for which trustees—either trust companies or commercial banks—serve as a passive facilitator, thanks to regulations that prohibit nonfinancial firms from making loans. Trust companies can decide on fund usage based on prespecified guidelines, whereas for entrusted loans they have to follow the lender’s request. These two types of loans could go to a wide variety of sectors, including real estate and local governments who have restricted access to formal bank credit. Finally, undiscounted bankers’ acceptances (0.96% of AFRE level by 2021) are guarantees by banks on behalf of depositors, which provide relatively weak support to the real economy (An and Yu, 2018).

Category 4 includes other forms of recent development in AFRE, such as government bonds, ABS issued by deposit-taking institutions, and loan write-offs. Government bonds, which include Treasury bonds, municipal special-purpose bonds, and municipal general-purpose bonds, account for 16.89% of AFRE level by 2021. ABS issued by deposit-taking institutions (0.69% of AFRE) and loan write-offs (2.01% of AFRE) were introduced as part of AFRE in July 2018. Loan write-offs are not widely seen in other major economies.

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2“Special-purpose” and “general-purpose” municipal bonds, which were introduced during the fiscal reform in 2014, correspond to “revenue” and “general obligation” municipal bonds in the U.S.; see Chen et al. (2020) and He (2020) for more institutional background.

3This part of ABS is under the regulation of the China Banking and Insurance Regulatory Commission (BIRCH); ABS regulated by China Securities and Regulatory Commission (CSRC) is included in corporate bond financing.
offs reduce new bank loans on the book of the banking system but the actual loans have been extended to the real economy; and therefore loan write-offs should be added back to AFRE.

2.2 Why Aggregate Financing to the Real Economy?

For a long time, bank loans represented the most important funding source for the Chinese economy. In the past two decades, rapid developments in Chinese financial system have led to increasingly diverse channels of financing for the real sector, while traditional measures of bank credit have become of increasingly limited use to reflect the full size of financing to the real sector. This trend has called into question the appropriateness of bank loans in representing aggregate funding, especially after the 2009 stimulus plan.

To see this point vividly, Figure 1 shows that the ratio of bank credit over GDP in China jumped from 97% in 2008 to 118% in 2009, but has remained stable since (Chen et al., 2020). However, using the AFRE measure, the AFRE/GDP ratio has continued to climb, rising from 119% in 2008 to 170% in 2012; the ratio reached 275% in 2021. Crucially, the rapid growth in nonbank financing causes concerns over financial stability from top policymakers in Beijing.

There are several important caveats for the AFRE measure. First, as emphasized by Zhu et al.
The AFRE concept, which covers much broader financing sources than on-balance-sheet bank loans, does not distinguish the degree to which various components support the economy.\(^4\) The second point is more relevant to researchers. Although closely related, AFRE is a separate concept from the shadow banking business in China, which mainly consists of trust and entrusted loans, wealth management products (WMPs), and underground lending (say P2P platforms); we will review China’s shadow banking industry in Section 4.3. AFRE is defined based on the asset side of banks’ and financial institutions’ balance sheets, focusing on supporting real economic activities. By contrast, shadow banking is more vaguely defined and focuses on various nonbank financial businesses, and some components could overlap with each other. One such leading example is WMP, which could be the funding sources—i.e., liability—for trust funds, implying that simply adding trust loans to WMPs will overstate the size of shadow banking.

3 Stock Market

The inception of China’s stock market, including the two domestic stock markets with one in Shanghai established in 1990 and the other in Shenzhen in 1991, is the most significant event for China’s financial system in the 1990s. The Shanghai Stock Exchange is the largest stock market in mainland China in terms of total market capitalization and trading volume, while the Shenzhen Stock Exchange hosts smaller companies. By the end of 2021, Chinese stock market hosted 4,615 listed firms, and its total market capitalization reached RMB 91.61 trillions, second only to that of the U.S.

Despite the rapid development of China’s stock market, its contribution to the AFRE level measure, which was 3.02% at the end of 2021, is surprisingly small (in contrast, corporate bonds stand at 9.53%). This is partly due to the accounting method of AFRE; as a measure of cumulative contribution of financing support to the real economy, it excludes capital gains. But as will be mentioned shortly, this is also due to frequent regulatory interventions on IPO approvals, which reflect the unpleasant fact that Chinese stock market is far from “efficient” compared to its western peers.

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\(^4\)For instance, similar to a letter of credit, an undiscounted bankers’ acceptance is merely a type of commitment that banks provide and hence represents a weak support to real sectors: it is not a loan unless banks need to make the payment or (other) banks accept it in the secondary market, nor a shadow loan until the acceptance holder obtains liquidity via underground lending (say, pledging it on some P2P funding platform).
We start with this section by reviewing early articles on this topic from the angle of SOE privatization; indeed, we emphasize that one of the main goals of establishing two stock exchanges is to transform SOEs into modern-form corporations. Section 3.2 covers IPOs, highlighting the problematic IPO and delisting processes in China. The inefficiency of the Chinese stock market is also reflected in ineffective corporate governance, as we will review in the rest of this section.

3.1 Stock Market and Privatization

During the economic reforms of the 1980s, motivated by the desire to promote market forces, Beijing launched a series of programs that decentralized the managerial decision rights of SOEs from the government to firms. In the 1990s, SOEs were partially “privatized” by issuing some minority shares to individual investors, who could then trade their shares in the newly established stock exchanges in Shenzhen and Shanghai. In the mainstream academic literature, this is often called share issuance privatizations, or SIPs, a term that we will use throughout this review article.

We emphasize, however, that China’s privatization program during 1990s differs fundamentally from other countries, say in Eastern Europe. The top authorities in China never used the term “privatization” or “partial privatization,” which, by explicitly stating private ownership, would implicitly hint at the ultimate goal of full privatization. This has never been the intention. Instead, the official term used by Beijing for this program is “share ownership reform” (股份制改造 in Chinese), which only introduces private investors to SOEs but does not transfer effective control from the state to private investors. Besides the obvious reason that SIPs allow the Chinese government to raise capital for SOEs (Jiang et al., 2009), the main motivation behind SIP was to subject the corresponding SOEs to market discipline, as share prices would reflect information on managerial decisions and firm performance. As put by Wang et al. (2004), “China’s share issue corporatization aims to transform an SOE into a modern-form corporation that features both state and non-state institutional shareholders in addition to small individual shareholders.” Nevertheless, to minimize potential confusion, this article still uses the word “privatization” to refer to this program.

There is no doubt that SIP has become an important measure taken by the Chinese government in the last decade to reform SOEs. However, many scholars question the effectiveness of this

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5 For western-style privatization and privatization in Eastern Europe and the former Soviet republics, see Megginson and Netter (2001) and Djankov and Murrell (2002).
program, arguing that it amounts to “nothing but a logo” or just “old wine in new bottles,” (Xu and Wang, 1997), as we will review shortly.

We make two further points. First, the papers reviewed here complement another related literature on the impact of the SOE reform on the performance of Chinese SOEs in early years, which are often founded on mixed evidence. On the positive side, based on data from the 1980s, Groves et al. (1994) show that the introduction of certain elementary incentives has brought a significant increase in productivity for Chinese SOEs, and Jefferson and Rawski (1994) praise the partial and gradual reform agenda that improved the operation of China’s state industries. However, on the negative side, Lin et al. (1998) argue that the reform is far from successful due to SOE policy burdens and resulting soft budget constraints. More recently, He et al. (2022a) study government-led incentive systems by examining a staggered reform in the SOE performance evaluation policy, and shed new light on challenges faced by economic reforms in China.

Second, although the SIP program and the establishment of the two stock exchanges are milestone events for SOE reform in China, there were many other widely used SOE privatization methods between the late 1990s and the mid-2000s. Based on a proprietary survey dataset, Gan et al. (2018) show that the most popular method of privatization was direct sales to insiders and/or outside private owners, which accounted for about 69% of all privatization programs; while public offering, which is the SIP program discussed in 3.1, made up only 1%. More importantly, it is direct sales to insiders that achieve the most performance improvement thanks to the transfer of control rights to private owners.\(^6\)

3.1.1 The impact of SIP program on firm performance

In an early study, Sun and Tong (2003) track 634 SOEs that have gone through the SIP program in the period of 1994–1998. By comparing performance in three years pre- and post-privatization periods, the authors find encouraging signs of improvement on “total” output measures like earnings and sales, but not in “per-unit” output measures like return on sales; the second negative impact was confirmed by Wang et al. (2004) who show that the return on sales of SOEs decreased around

\(^6\)Du and Liu (2015) conduct an empirical analysis on the SOE privatization over the period of 1998–2008 using the National Bureau of Statistic census data, which covers both listed and unlisted firms. They demonstrate not only a complex decision-making process for privatizing SOEs, but also a slowdown of the privatization reform in China during 2005–2008.
the time of privatization. Sun and Tong (2003) highlight that SOEs increased their leverage ratio after SIP, suggesting an enhanced borrowing capacity after listing. Sun and Tong (2003) conclude that China’s privatization has achieved some success, but the success is limited when compared with the privatization programs in other countries.

As with many other papers, Sun and Tong (2003) blame partial privatization for the disappointing outcome, as they show that state ownership is negatively related to firm performance upon and after SIP. An important caveat, though, is “legal entity ownership,” which is essentially shareholding of other SOEs; in the context of ownership structure of Chinese companies, “legal entities” are typically business agencies or enterprises of local governments that often have significant resources to be used by the company in question. The positive association between performance and legal entity ownership documented in Sun and Tong (2003) is consistent with Xu and Wang (1997) who argue that legal entities can be more effective in monitoring as they are typically large blockholders who serve the same role as institutional investors in developed economies.

Many papers followed Sun and Tong (2003). Jiang et al. (2009) highlight that China’s SIP is a primary offering process in which the SOE-turned listed company issues new shares directly to private investors and keeps the offering proceeds, rather than the secondary offering process as in most other countries (see Bolton and Roland (1992) for countries in central and eastern Europe) through which the government (which sells its equity stake in an SOE) receives the offering proceeds. It is interesting to note that the chosen “privatization” method, which involves no sales of government stake, is consistent with the notion mentioned in Section 3.1 that SIPs allow the Chinese government to raise capital for SOEs without any intention of ultimate privatization. More importantly, Jiang et al. (2009) point out that since a primary offering causes a commensurate increase in the firm’s assets, size-related measures (i.e., “total” output like sales) that are used by Sun and Tong (2003) and Wang et al. (2004) cannot capture efficiency improvement and hence are inappropriate in the Chinese context.

Revisiting Sun and Tong (2003)’s research question, Jiang et al. (2009) demonstrate a positive

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7 In Chinese, it is called 法人股, which is interchangeably translated as “legal person ownership” or “legal entity ownership.” For more institutional details of ownership structure in China, see Wei et al. (2005), who offer a comprehensive coverage of the six different categories of shares (state, legal entity, foreign, insider, employee, and individual A-shares).

8 In a concurrent paper, Wei et al. (2003) show similar results as Sun and Tong (2003) but with a longer sample period (1990-97).
impact of SIP on Chinese SOEs during the period of 1999–2002, which is three years after the sample period covered by Sun and Tong (2003). The authors attribute it to the improved institutional environment in the Chinese stock market since 1999, thanks to the establishment of the CSRC in 1998.

Methodology wise, Jiang et al. (2009) use a matching sample method by identifying matched SOEs that were in the same industry and with similar characteristics but had not gone through the SIP process; this can partially address the selection bias in Sun and Tong (2003). Jiang et al. (2009) show the SIP firms continued to experience negative post-SIP profitability changes, and this “difference” result is consistent with Sun and Tong (2003). However, the performance decline of these SIP firms was significantly less than that of matched-SIP SOEs, and this “difference-in-differences” result suggests a positive effect on the profitability of Chinese SOEs during the period of 1999–2002. The same “difference-in-differences” approach is used in Fang et al. (2017) who show that corporate innovation increases after SOE privatizations, and this increase is larger in cities with stronger intellectual property rights protection.

Huyghebaert et al. (2014) examine the post-listing financing decisions of 221 Chinese SOEs that went through SIPs in the period 1994–1999, and ask whether a stock market quotation by itself can perform the disciplining function by the financial market. Huyghebaert et al. (2014) give an overall negative answer, but by showing the soft budget constraints enjoyed by SOEs have been prolonged for firms with large government stake, they present one interesting empirical fact that points to the positive role of a public stock market. They show that SOEs with increasing accounts receivable—i.e., trade credit—are more likely to take out bank loans as well as to issue new shares. Arguably, these listed SOEs used their better access to external finance to ease the financial constraints of their trading partners, potentially resulting in a more efficient capital allocation. In this regard, this paper is connected to Cull et al. (2009) who study how Chinese firms with privileged access to bank loans redistribute their loans to their trading partners—presumably without such access—via trade credit; we will review this article in Section 4.2.1

Ownership structure and firm performance is another active research topic. Consistent with Sun and Tong (2003), Wang (2005) find a sharp decline in post-listing operating performance of SIP firms listed between 1994 and 1999. But in contrast to Sun and Tong (2003), Wang (2005) find that neither state ownership nor concentration of ownership is associated with this negative post-listing
performance; legal entity ownership is shown to have a nonlinear relationship with performance changes, a result that is more subtle than the positive association documented in Sun and Tong (2003). Wei et al. (2005) give a nice description of the six different categories of shares (state, legal entity, foreign, insider, employee, and individual A-shares), and show that state and legal entity shares are significantly negatively related to Tobin’s Q, while foreign shares are positively related. This suggests that agency conflicts in Chinese listed SOEs are exacerbated (alleviated) by state (foreign) ownership.

### 3.1.2 Split-share structure reform and its implications

In this section we review the literature on China’s split-share structure reform, which occurred mainly between 2005 and 2007. We describe the institutional background of the reform heavily drawn from Liao et al. (2014).

**Background of split-share structure reform** An awkward legacy problem left by the SIP program launched in the 1990s is the split-share structure. In short, the split-share structure involves two classes of domestic A-shares with otherwise identical rights, tradable and non-tradable, coexisting in a listed firm. All shares that existed before SIPS, which could be owned by state, legal entities, and natural persons, were called non-tradable shares and could not be traded in the secondary market on the stock exchanges. Only new shares issued in SIPS, seasoned equity offerings, and those derived from tradable shares in rights offerings and stock splits were tradable on the stock exchanges.

The legacy that the split-share structure created hindered the functioning and development of China’s financial markets, as the interests of tradable and non-tradable shareholders naturally diverged due to different pricing mechanisms. What is worse, Liao et al. (2014) report that the median of non-tradable shares, as a fraction of total shares outstanding, to be 61.85% before the reform; this implies that the issue of split-share structure is especially acute because the shares held by controlling shareholders are typically non-tradable and hence lack the benefit of capital gains. Controlling shareholders would push listed firms to relentlessly raise money through seasoned

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9This restriction was either explicitly written in public offering prospectuses or publicly announced. At that time, non-tradable shares were allowed to be transferred through negotiations between parties, subject to the approval of relevant regulatory authorities.
offerings, and would then exploit minority shareholders through either related-party transactions (e.g., Jian and Wong, 2010) or, even more bluntly, asking listed firms to make personal loans to controlling shareholders (e.g., Jiang et al., 2010). Simply put, neither control dilution nor adverse market reactions concerned controlling shareholders, who had absolute control but did not benefit from capital gains.

In 2005 Beijing launched the split-share structure reform, or simply share-reform, which aimed to convert all non-tradable shares into legitimate tradable shares by paying tradable shareholders certain negotiated considerations. The consideration package, which could be paid in cash or stocks, was market-driven without government imposed pricing schedules; often it was sweetened by some legally binding promises by controlling non-tradable shareholders on future dividend payouts and/or asset injections. The proposals then circulated for tradable shareholder feedback and negotiation. By 2010, 98.58% of listed firms had completed the share reform, leaving “non-tradable shares” to become history.¹⁰

**Share-reform: Does it only matter for SOE?** Although most papers in the literature viewed the share-reform as part of the “privatization” of SOEs, the deep economic drawback of the existence of non-tradable shares is also relevant to non-SOEs. In fact, Liao et al. (2014) report that about 40% of the listed firms in their sample are non-SOEs; and more importantly, the fraction of non-tradable shares of SOEs and non-SOEs are 60.15% and 62.51%, respectively, which is remarkably similar across these two groups. This echoes the claim in Jiang and Kim (2020) that “the dominant agency problem in China is the horizontal agency conflict between controlling and minority shareholders arising from concentrated ownership structure,” regardless of whether the controlling shareholders are government agencies (for SOEs) or founders (who hold natural person shares, for non-SOEs). We discuss this issue further in Section 3.3.

**The impact of share-reform** Based on 1,032 firms (633 SOEs and 399 non-SOEs) that completed the share-reform during the period of 2005–2007, Liao et al. (2014) study the effect of “privatization” (Megginson et al., 1994; Megginson and Netter, 2001) by exploiting the fact that the reform was carried out on both SOEs and non-SOEs. For non-SOEs, the reform dismantled

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¹⁰As of 2021, there is only one listed firm, Giti Tire Corporation (600182.SH), that has not completed the share-reform.
the split-share structure only, while for SOEs the reform has the additional effect of removing legal barriers to in-depth privatization. Liao et al. (2014) find an significant improvement in “total” output measures (e.g., output, profit, employment) for both groups after the reform, and much more so for SOEs. On “per-unit” output efficiency measures (e.g., operating profit per employee and ROE) and corporate governance measures (e.g., related-party transactions and lending to controlling shareholders), both SOEs and non-SOEs performed much better after the reform, although the difference between two groups is insignificant.\footnote{The difference between “total” output measures and “per-unit” efficiency measures is consistent with the literature on the impact of the SIP program reviewed in Section 3.1.1.}

Being concerned narrowly with the “privatization” effect, Liao et al. (2014) conclude that the share-reform had a “privatization” effect that quickly boosted SOE output and profits, but did not change SOE corporate governance and operating efficiency. However, their empirical results are also consistent with the interpretation of that share-reform delivered a great success. By removing non-tradable shares, it helped align the controlling shareholders’ incentives better with minority shareholders, leading to a significant improvement on firms’ efficiency and corporate governance regardless of state ownership; while privatization—or more accurately, the expectation of privatization—played little role in the share-reform.\footnote{The additional “total” output boost due to privatization can be driven by the fact that state-shareholders have more resources to deploy for asset injections as a part of the consideration package (this point is similar to the difference between primary offering and secondary offering highlighted by Wang (2005) in Section 3.1.1).} This echoes Beijing’s long-standing position that the ultimate goal of SOE reform is not full privatization. Indeed, after the share-reform so that controlling shareholders were allowed to sell, state-shareholders had sold only 2.95% of their now-tradable shares (or 0.44% of total shares outstanding) to public investors, as of October 2011 (Liao et al., 2014).\footnote{It is still possible that market participants held a belief of further privatization when the share-reform was implemented around 2005–2007; Tan et al. (2020) show that the potential partial privatization prospects had a positive effect on corporate innovation.} Today, although the split-share structure no longer exists, controlling shareholders’ shares remain illiquid for various reasons including insider trading regulations (Lian et al., 2022), maintaining control rights, and implicit restrictions on the trading of state-owned shares.

Taking the angle of corporate governance, Chen et al. (2012) study the impacts of share-reform on the cash holdings. The authors focus on the distinctive impacts between SOEs and non-SOEs, and the contrast offers deep insight into the distinct natures of agency conflicts in these two groups of Chinese listed firms. The agency conflict in SOEs is shaped by the controlling shareholders’ shares remaining illiquid.
government-agency’s objective function, which typically involves non-pecuniary considerations; and the government-agency itself is often subject to its own system of internal controls (Lin et al., 1998). For non-SOEs, their controlling shareholders would not have political and social welfare objectives, but may view their listed firms’ cash as a means to satisfy their own needs. Consistent with this perspective, Chen et al. (2012) report that the reduction in cash holdings in response to the share-reform is larger in non-SOEs than in SOEs.

Through which economic mechanism do the pre-share-reform agency conflicts work, the free cash flow channel or the financial constraints channel? Chen et al. (2012) show that post the share-reform, non-SOEs increase dividend payouts but not capital investment, pointing to the free cash flow channel, whereas SOEs mainly increase capital investment and short-term borrowings, pointing to the financial constraint channel. These findings are consistent with the perspective that corporate insiders’ ability to make personal use of corporate cash was relatively more constrained in SOEs because their controlling owners are organizations with their own systems of internal controls. This point was vividly illustrated by Lin et al. (2022) who study the impact of State Capital Operation Program initiated in 2007 under which parent central SOEs are required to partially contribute their income to the fiscal fund in China.

Compensation in the share-reform As explained, the share-reform involves a market mechanism where non-tradable shares offer negotiated compensation to tradable shareholders, which typically comes in the form of additional shares. Li et al. (2011) report that the average compensation from non-tradable shares is a 30% increase in the number of shares held by tradable shares. Highlighting the risk-sharing role of the share-reform from the perspective of non-tradable shareholders, Li et al. (2011) further show that the compensation size is positively associated with the gain from risk-sharing.

From the angle of ownership, Firth et al. (2010) show that the compensation ratio decreases with the ownership of mutual funds that own tradable shares, suggesting that mutual funds bow to political pressure to help these firms implement the reform quickly and at relatively low cost. A broader takeaway, which is consistent with many other studies in this literature, is that minority shareholders cannot count on institutional investors in China to monitor effectively.
3.2 Initial Public Offerings (IPO)

IPOs and privatization are two sides of the same coin in the SIP program. A great survey by Qian et al. (2021), titled “Initial Public Offerings Chinese Style,” covers many important aspects of the IPO market in China—the policy evolution, IPO pricing, bidding and allocation practices, and aftermarket trading—during the period of 1990–2018, emphasizing that the unique regulatory background is essential to understand China’s IPO market. Besides an extremely severe IPO underpricing, Qian et al. (2021) present another interesting empirical fact: During aftermarket trading, IPO institutional bidders, whether or not they received an allocation, rarely buy the stock on the open market, and those who receive allocations sell the majority of their shares in the first week once they are allowed to do so. This implies that Chinese investors—including those institutional ones—pay little attention to firm fundamentals given their ultra-short investment horizons.

Several papers explore the connection between IPO underpricing and long-run underperformance with political economy. Chen et al. (2015) find that SOEs underprice their IPOs more than non-SOE firms, and SOEs controlled by the central government underprice even more compared to their local government peers. In Fan et al. (2007), politically connected IPO firms, defined as those whose CEOs are current or former government bureaucrats, underperform other IPO firms in the long-run. Piotroski and Zhang (2014) argue that IPOs, which are viewed as a barometer for economic growth and market development, can be politically motivated. Indeed, local IPO volume goes up before an impending provincial-level political promotion event, and these promotion period IPOs underperform other IPOs in the long-run.

Finally, Cong and Howell (2021) point to an important issue that is unique to China: the lengthy IPO approval process and regulatory-driven suspensions. In China, a firm seeking to conduct its IPO must navigate an elaborate process administered by the CSRC.14 What is more, regulators have on multiple occasions suspended all IPO activities. In normal, non-suspension times, it often took two to three years for firms to obtain IPO approval, and once approved it took several months to complete the final steps. Because firms could not time the IPO market given the

14This is the so-called approval-based system, which contrasts with the registration-based system in the U.S. In 2019, a pilot registration system was introduced for the Science and Technology Innovation Board (STAR Market), and at the end of 2021 the registration system was applied to the other boards.
multi-year time frame from application to listing, market-wide IPO suspensions are viewed largely as a surprise for IPO-seeking firms. Exploiting suspension-induced delay as a plausibly exogenous shock, Cong and Howell (2021) show that IPO delay has a long-lasting negative effect on corporate innovation, while the negative effect on tangible investment is only temporary.

3.3 Corporate Governance

China’s corporate governance problem is rooted in its concentrated ownership structure, featuring the severe conflict of interest between controlling shareholders and minority shareholders. In a thorough and insightful review paper, Jiang and Kim (2020) highlight several distinct features of controlling shareholders in China. First, there are two types of controlling shareholders, the state and the family; the latter maximizes profit while the former also carries political responsibilities. Consistent with this view, Chen et al. (2012) find different reactions from firms with different controlling shareholders, as reviewed in Section 3.1.2. Second, controlling shareholders, not CEOs or chairs of the board, are the primary decision-makers.\(^{15}\)

3.3.1 Controlling shareholders and related party transactions

Before 2006, a common practice through which controlling shareholders expropriated minority shareholders was intercorporate loans, which are a form of related party transactions. Typically reported as “other receivables” on the balance sheet, these intercorporate loans averaged about 8% of total assets, and were usually interest free and almost never paid back (Jiang et al., 2010). Gul et al. (2010) argue that when large shareholders in China own more than 50% of the firm, their significant cash flow rights will make expropriation costly; indeed, intercorporate loans are more severe when controlling shareholders have lower shares, as shown in Jiang et al. (2010). This point not only echoes the agency conflict between controlling and minority shareholders as one of the major drawbacks of the split-share structure (Section 3.1.2), but also suggests the bright side for controlling shareholders once they have sufficient cash-flow rights. This hypothesis is confirmed in Jiang et al. (2017): In China, listed firms with a majority owner have the best performance (measured by ROA), and listed firms with a controlling shareholder that owns less than 50% of the

\(^{15}\)This is especially true for non-SOEs (though often the controlling shareholder is also the chair); SOEs usually delegate control to the chair.
firm have the worst performance.

Controlling shareholders may also benefit minority shareholders when they conduct related party transactions on favorable terms to listed firms with poor financial conditions, including buying firms’ assets at high prices or lending at favorable interest rates. Jian and Wong (2010) show that firms use related party transactions to prop up earnings and thus meet earnings targets. However, propping may benefit minority shareholders only in the short run; Peng et al. (2011) show that propping is only temporary, and in some cases cash is transferred back to the controlling shareholder eventually.

3.3.2 Boards of directors

The controlling shareholders also nominate and appoint a board of directors, rendering the monitoring role of the board largely ineffective (Jiang and Kim, 2015). However, some types of directors still conduct partially effective monitoring. For instance, Jiang et al. (2016) show that dissent from independent directors improves corporate governance by conveying value-relevant information to the market. However, in Jiang et al. (2016), only 6% of independent directors—who are career cautious and highly reputed—dissent even once; and most of these dissents occur during the directors’ last terms when they are less beholden to controlling shareholders.

Giannetti et al. (2015) study another important type of directors who have experience with superior corporate governance practices from abroad. Starting in the late 1990s, various Chinese provinces started implementing policies to attract skilled emigrants (who went abroad for education in the 1980s and then subsequently remained abroad for employment) to return to China. (Giannetti et al., 2015) show evidence suggesting that directors with foreign experience facilitate the adoption of strong corporate governance practices.

3.4 Other Topics on China’s Stock Markets

The literature on China’s stock markets is much wider than financial market reform, an angle that this section has taken so far. The rest of this section touches on several topics that fall in the

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16 In western countries, boards of directors who represent shareholders are supposed to be the main monitor of the listed firms. Whether they are effective in this role, however, is widely debated; for a survey of the evidence, see Adams et al. (2010).
mainstream finance literature; they are chosen not only for their significance but also for their close connection to the real economy.

3.4.1 Risk, returns, and factors

Hu et al. (2021) report that over the period of 1993–2020, the Chinese stock market yielded an average annual return of 13%, with a volatility of 43%; in contrast, the U.S. stock market during the same period delivered an average annual return of 10%, with a volatility of 19%. These statistics suggest that China’s stock market underperforms on risk adjusted basis. Along a similar line, Allen et al. (2021b) highlight that the relative underperformance of Chinese stock market is even more striking when compared to its overall economic growth in the past two decades.

Moving on to the cross-section aspect of Chinese stock returns, many papers have studied the “standard” factors—say Fama-French three factors, momentum, etc.—that are well-known in the U.S. market; we refer those interested readers to Hu et al. (2021), who offer a comprehensive review of this literature. It is worth highlighting that a few papers take into account the China-specific institutional settings, and one such leading example is Liu et al. (2019b), who construct size and value factors in China differently from the classic Fama and French, 1993. It is well-known that in China, under-performing listed companies, which tends to be small firms by definition, have a significant “shell” value due to the possibility of reverse merger and acquisitions, in which an unlisted company obtain a listed status by acquiring one of these under-performing listed firms (Lee et al., 2022). In light of this issue, the size factor in Liu et al. (2019b) excludes the smallest 30% of firms, which are companies that could be valued significantly as potential shells in reverse mergers that circumvent tight IPO regulations (see Section 3.2).

3.4.2 Price informativeness

In an influential paper, Morck et al. (2000) run a CAPM-style regression for each individual stock, and use the resulting R² as an inverse measure of firm-specific information content in the price of this stock. The greater the R², the higher the synchronicity across all stocks, and hence the less the price-informativeness in the stock market. Morck et al. (2000) document that emerging markets typically have a higher synchronicity, and point out that China is an example with especially high synchronicity. Consistent with Morck et al. (2000), Gul et al. (2010) show the stock price
synchronicity in China is positively related to whether the largest shareholder is government related. Finally, Carpenter et al. (2021) measure stock price informativeness as the predicted variation in a cross-sectional regression of future earnings on past market valuations. Surprisingly, the authors find that stock prices in China are as informative about future profits as they are in the U.S., especially after financial reforms in the first decade of the twenty-first century.

3.4.3 Share-pledging

Share pledging, in which shareholders obtain loans with their shares on listed companies as collateral, is a unique financing vehicle at the intersection of the stock market and banking system. It is a significant component of China’s financial system; at the market’s peak in 2017, more than 95% of the A-share listed firms had at least one shareholder pledged, with the total value of pledged shares amounting to 6.15 trillion RMB (> 10% of total market capitalization).

Share pledging is shown to destroy firm value in most studies, since pledging shareholders who are facing margin calls are likely to alter their decisions,17 through manipulating earnings (Deren and Ke, 2018), cutting corporate innovation (Pang and Wang, 2020), engaging in mergers and acquisitions (Zhu et al., 2021), and conducting related party transactions (Li et al., 2020b); the exception is Guo et al. (2020) who document a positive shareholder wealth effect on listed firms.

One piece of conventional wisdom in this literature is that share pledging funds circle back to the listed firms (e.g., Meng et al., 2019; Pang and Wang, 2020). He et al. (2022b) challenge this view and clarify that pledging funds are at the discretion of the shareholders who pledge their shares; these funds could be used for personal debt repayment, personal consumption, or financial investments, among others. Based on the survey conducted by He et al. (2022b), a majority of shareholders (67.3%) used pledging funds outside the listed firms, consistent with Pan and Qian (2019) who show that shareholders pledge shares to reduce the financial constraints of their non-listed holdings.

By linking firm registration data with share pledging data, He et al. (2022b) offer a more positive perspective on share pledging, arguing that shareholders’ pledging transactions are related

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17 On a related topic, margin trading, in which investors take a leveraged position in eligible stocks by borrowing from their brokerage firms, became available in Chinese stock markets in 2010. Margin trading became popular during the 2014–2015 Chinese stock market boom and subsequent crash, based on which Bian et al. (2021) and Hansman et al. (2022) study margin trading and its implications on stock prices.
to their entrepreneurial activities. Utilizing the launch of the exchange market in 2013 as a quasi-natural experiment that favors share pledging by natural person shareholders (against legal entity shareholders), He et al. (2022b) show natural person shareholders increased their entrepreneurial activities significantly in response to the policy shock.

4 Banks and Shadow Banking

The banking and its associated shadow banking are the first two categories of AFRE mentioned in Section 2.1. As has been pointed out by many leading scholars (Allen et al., 2019a, 2017), China’s financial system has been dominated by a large banking system compared with other developed and emerging economies. In this section we first offer a brief account of the reform process in Chinese banking sector, which was drawn heavily from Liu (2009) and Jiang and Zhan (2019). We then review two topics that are key to understanding the functioning of Chinese banking system: how bank credit affects China’s economic growth, and shadow banking.

4.1 A Brief History of Banking Reform in China

Before 1978, China followed a mono-bank system in which the PBC operated simultaneously as the central bank and the sole commercial bank. In 1978, the state embarked on a major program of economic reform, which unfolded in a gradual and evolutionary fashion. The China Banking Regulatory Commission (CBRC) classifies the process of banking reform into three stages.\(^1\)

4.1.1 The first stage: 1978–1993

The first stage of banking reform focused on expanding and diversifying the banking system. After separating the PBC from the Ministry of Finance (MOF) in 1978, the government split off the commercial banking function of PBC into four newly established or reestablished state-owned specialized banks, also known as the “Big Four”: the Agricultural Bank of China (ABC), the Bank of China (BOC), the China Construction Bank (CCB), and the Industrial and Commercial Bank of China (ICBC).\(^2\) It then formally promulgated that the PBC would function as China’s central

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\(^1\) The CBRC, as the supervisory agency of China’s banking system, was merged with the China Insurance Regulatory Commission, becoming the China Banking and Insurance Regulatory Commission (CBIRC) in 2018.

\(^2\) The Big Four operated in well-defined and nonoverlapping types of businesses: ABC for the rural and agricultural sectors; BOC for foreign trade and investment, CCB for construction and fixed asset investment, and ICBC for other
bank. Beijing also gradually introduced competition into the banking system by allowing the entry of new financial institutions, including urban credit cooperatives, postal savings institutions, and joint-stock banks. However, the banking sector still operated in a credit plan system controlled by the PBC, and the Big Four dominated the lending market, functioning mainly as policy lending conduits.

4.1.2 The second stage: 1993–2003

In 1993, the State Council issued “Decision on Financial System Reform,” preluding the second stage of banking reform featuring the commercialization of the banking system. Three policy banks were established in 1994 to take over the policy lending deals from the Big Four, with the China Development Bank (CDB) being the largest policy bank. In 1995, the Big Four were officially named “state-owned commercial banks” by the Commercial Bank Law. Rural credit cooperatives left the administrative control of the ABC; urban credit cooperatives were transformed into city commercial banks.

In 1998, the PBC abolished the credit plan system and required banks to improve the asset-liability management that had been introduced in 1994. An important rule of the asset-liability management, which Beijing removed in 2015, was the 75% loan-to-deposit cap: Banks were prohibited from lending more than 75% of the value of their deposits. Although the PBC could still intervene, banks gained more independence to manage their credit allocation and pursue commercial objectives. However, the separation between the policy-lending function and commercial-lending function was far from complete. With the ongoing SOE reform, the Big Four shouldered a growing burden to fund state-directed investments and extend loans to loss-making SOEs, resulting in high proportion of non-performing loans (NPLs).

Under the “Grasp the Large, Let Go of the Small (抓大放小)” strategy in late 1990s (Hsieh and Song, 2015), the loan quality of Big Four severely deteriorated. In 1998, MOF issued RMB 270 billion of special Treasury bonds to recapitalize the Big Four, and the newly created state-owned more generic enterprises.

20 The credit plan system is a mandatory quota system under which the PBC sets the lower limit on new loans and their allocation to specific sectors on an annual basis.

21 The other two policy banks are the Export-Import Bank of China and the Agricultural Development Bank of China.
asset management companies (AMCs) acquired nearly RMB 1.4 trillion of NPLs at book value from the Big Four. Meanwhile, China’s accession to the World Trade Organization (WTO) in 2001 yielded a timetable to integrate China into the global economy. Specifically, the banking sector was committed to open up to foreign competition within five years of accession, bringing heavy pressure onto domestic banks.

4.1.3 The third stage: 2003–present

The third stage of banking reform started in 2003 and focused on the “share ownership reform.” At the 3rd Plenary Session of the 16th Central Committee of the Communist Party of China in October 2003, Beijing officially approved the share ownership reform plan of state-owned commercial banks. Besides the Big Four, the Bank of Communications (BOCOM), which the CBRC officially classified as a state-owned commercial bank in 2007, was also included in the share ownership reform, turning the “Big Four” into “Big Five.”

The share ownership reform involves three steps: recapitalization, the disposal of NPLs through AMCs, and the introduction of foreign strategic investors. In December 2003, Central Huijin Investment Company (Central Huijin) was established as a wholly state-owned company, authorized by the State Council to exercise rights and obligations as shareholders in state-owned financial institutions. From 2003 to 2008, Central Huijin injected a total of USD 79 billion capital funded from foreign exchange reserves into the Big Four, and RMB 3 billion capital funded from PBC relending to BOCOM. Meanwhile, after the Big Five transferred a total of RMB 2 trillion of NPLs to their respective AMCs (which is about 11% of total book assets), which was evident from the NPL ratio evolution in Figure 2, several international financial institutions including Goldman Sachs joined as strategic investors into the restructured state-owned commercial banks. From 2005 to 2010, the Big Five launched successful IPOs on both the Shanghai Stock Exchange and the Hong Kong Stock Exchange. The Postal Savings Bank of China (PSBC) was founded in 2007 on the basis of China’s postal savings system, and went public on the Hong Kong Stock Exchange (in 2016) and the Shanghai Stock Exchange (in 2019). The CBRC classified PSBC as a state-owned commercial banks at the end of 2018, initiating the “Big Six” era.

State-owned banks were not the only entities to undergo drastic changes during this period. In December 2006, foreign banks were allowed to open local subsidiaries without any geographical
or customer restrictions. In April 2009, the CBRC relaxed the geographical branch restrictions for joint-stock banks, substantially promoting their expansion (Gao et al., 2021b); city commercial banks and rural financial institutions were classified as regional banks under strict geographical restrictions (Zhang et al., 2012). In 2014, Beijing started opening its banking sector to private investors; Gambacorta et al. (2022) study MYbank, the private commercial bank owned by Alibaba. Figure 2 depicting the evolution of China’s banking sector shows that the relative proportion of state-owned commercial banks by total assets decreases from 54.93% in 2003 to 39.27% in 2021.

Embarking on interest rate liberalization reforms in the late 1970s, China made significant progress in the 2010s. The PBC scrapped bank lending rates and deposit rate ceilings in 2013 and 2015, respectively. In 2019, the PBC introduced the market-driven loan prime rate (LPR) as the

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22 Rural financial institutions consist of rural cooperative financial institutions (including rural commercial banks, rural cooperative banks and rural credit cooperatives), and new-type rural financial institutions (including village and township banks, lending companies and rural mutual credit cooperatives).
benchmark lending rate, and reformed the way participating banks submit quotations.\footnote{Participating banks submit quotes in terms of the LPR spread over the policy rate (medium-term lending facility rate), instead of the LPR itself \cite{He_2020}.} In 2015, PBC launched an official deposit insurance scheme that covered more than 99\% of depositors for up to RMB 500,000 ($80,700) each, paving the way for banks to compete without putting depositors at risk. Replacing implicit the guarantee (Section 4.3.1) with an explicit guarantee, this is an important step for interest rate liberalization, which is studied in Liu et al. (2021c) and Buchak et al. (2021), among others.

Regarding liquidity regulation, the CBRC tightened the enforcement of the 75\% loan-to-deposit cap after 2008. Hachem and Song (2021), which will be discussed in Section 4.2.1, argue that in the presence of interbank market power, a regulatory tightening of liquidity rules can trigger unintended credit booms funded by shadow banking; this echoes Chen et al. (2018), who show that shadow banking hampers the effectiveness of monetary policy in China. Although the 75\% cap for loan-to-deposit ratios was removed in 2015, banking regulators are still monitoring banks’ loan-to-deposit ratio as a liquidity indicator today.

4.2 Bank Loans and Real Economy

4.2.1 Bank incentives and capital allocations

Using a sample of Chinese SOEs spanning 1980 to 1994, an early study by Cull and Xu (2003) provides perhaps the first evidence that bank finance was positively linked to both profitability and reform effort (e.g., allowing managers to have discretion to set wages within the SOE); this positive relationship is also confirmed in Firth et al. (2009) whose sample are non-SOE firms covered in the World Bank survey in 2003. But do Chinese state-owned banks have the right incentives to allocate their funds to stronger firms based on their commercial judgments? Cull and Xu (2003) argue that the banking reform launched in 1978 has improved the incentives of bank employees in evaluating credit risk. The authors interviewed a vice executive of a county branch of ABC, who reported that the compensation package of bank employees—mainly in the form of bonuses—was linked to the quality of the lending portfolio. Supervised by high-level offices, bank branches were often subject to certain credit plans that specified the total amount of loans to various sectors, but they had

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discretion to determine which firms to receive loans based on factors such as profitability.\textsuperscript{24} 

Of course, the working of the financial system does not necessarily require banks to allocate credit to better firms. For instance, \textit{Cull et al. (2009)} document that firms with privileged access to bank loans redistribute their loans to their trading partners—who presumably lack such access—via trade credit. \textit{Cull et al. (2009)} highlight the difference between SOEs and non-SOE\textsuperscript{s}; based on a large sample of industrial firms during the period of 1998–2003, the authors show that poorly performing SOEs were more likely to extend trade credit, while for non-SOE\textsuperscript{s} the firm probability is positively correlated with trade credit.\textsuperscript{25} 

\textit{Bailey et al. (2011)} paint a different picture from that in \textit{Cull and Xu (2003)}. Bank loans could serve as a positive signal for borrower’s quality, a hypothesis that receives strong empirical support based on U.S. data (\textit{James, 1987}); or could be made for policy goals, a hypothesis that is especially relevant in the context of China. Indeed, based on loan announcements for all listed companies from 1999 to 2004, \textit{Bailey et al. (2011)} document significant declines in borrowers’ stock prices at times of loan announcements. The negative effect is stronger for firms with more frequent related-party transactions and higher state ownership, suggesting that state-owned banks do not perform the monitoring role as in western-style corporate governance mechanisms. 

The two leading papers reviewed above present a puzzle for the finance–growth nexus literature, which has shown that financial development is an important factor in promoting economic growth.\textsuperscript{26} On the one hand, as argued in \textit{Allen et al. (2005)}, China seems to be a counterexample to the finance–growth nexus hypothesis; on the other hand, \textit{Ayyagari et al. (2010)} document a positive correlation between bank loans and economic growth in China. We will return to this topic in Section 4.2.3.

There are two nice theory papers that study how the Chinese banking system reform affects capital allocation. \textit{Liu et al. (2021c)} focuses on interest rate liberalization; their general equilibrium

\textsuperscript{24}Cull and Xu (2003) emphasize that the local government did not have direct authority over the local branches of banks. Those branches reported to branches further up in the hierarchy of the affiliated bank. Thus, local government had at most limited influence over bank decisions.

\textsuperscript{25}Cull et al. (2009) warn against the interpretation that relatively inefficient SOEs have channeled their received credit to more efficient trading partners; rather, they suggest these SOEs extended trade credit to prop up faltering customers that were in arrears. However, there is no evidence to support the latter interpretation.

\textsuperscript{26}Based on the provincial-level data during 1999–2007, Lin et al. (2015) show that the industrial growth is positively associated with the fraction of non-Big-Four banks, pointing to the Big Four as the root cause of the inefficiency of Chinese banking sector.
model features two sectors, one with less efficient SOEs with subsidy, and the other with more efficient non-SOEs without subsidy. Although interest rate liberalization improves capital allocations within each sector, it exacerbates misallocations across sectors—in general equilibrium, a higher deposit rate encourages more savings that flow disproportionately to less efficient SOEs. Taking a different angle at funding competition in interbank market, Hachem and Song (2021) construct a model in which, somewhat surprisingly, liquidity regulation can trigger unintended credit booms in the presence of interbank market power. After liquidity tightening, smaller price-taking banks respond with more aggressive shadow banking activities to circumvent liquidity regulations, causing a funding reallocation away from the big price-setting bank and potentially a credit boom. Both papers demonstrate that regulatory actions often lead to unintended yet profound consequences, especially given the unique institutional features of Chinese financial markets.

4.2.2 The 2009 four-trillion RMB stimulus plan and its impact

Right after the global 2007/08 financial crisis hit the export-driven Chinese economy heavily, the State of Council of China announced to great fanfare the four-trillion RMB fiscal plan on November 2008. Most of the massive 2009 stimulus package was implemented through China’s local governments, who finance the infrastructure investment by bank loans through the off-balance-sheet local government financing vehicles, or LGFVs (Bai et al., 2016; Fardoust et al., 2012; Deng et al., 2015; Zilibotti, 2017).

Bai et al. (2016) offer a great account of the institutional details of how China implemented its stimulus program. Although the “tax sharing reform” in 1994 prohibited local governments from borrowing or running deficits, to circumvent these restrictions, in 2009 local governments were allowed to borrow heavily via LGFVs to fund the stimulus spending. In a typical arrangement, a local government transfers ownership of a plot of land to an LGFV, which then borrows from banks using the land as collateral. Bai et al. (2016) estimate that about 90% of local government investment was financed via bank loans in 2009, consistent with the sudden dramatic increase of newly issued bank loans—especially from the Big Five and the three policy banks—in 2009 recorded in the AFRE data.\(^{27}\)

\(^{27}\)The newly issued bank loans in 2009 almost doubled from that of 2008, rising from 4.9 trillion RMB in 2008 to 9.6 trillion RMB in 2009.
This one-time massive on-balance-sheet credit expansion has had long-lasting and unintended consequences; it not only caused potential capital misallocation, as emphasized by Bai et al. (2016), which shaped China’s economic growth path in the past decade, but also planted the seed for the surging shadow banking several years later, as emphasized by Chen et al. (2020). We review two papers on the topic of capital misallocation; Section 4.3 covers those studies on shadow banking.

By matching the comprehensive loan-level dataset mentioned in Section 4.2.1 with firm-level data on manufacturing firms, Cong et al. (2019) document that the stimulus-driven credit expansion in 2009 disproportionately favored state-owned firms and firms with a lower average product of capital, reversing the process of capital reallocation toward private firms that characterized China’s high growth before 2008. The authors argue that implicit government guarantees for state-connected firms become more prominent during recessions and can explain this reversal. Huang et al. (2020b) show that during the stimulus period local public debt crowded out the investment of private firms by tightening their funding constraints while leaving state-owned firms’ investment unaffected. Both papers are consistent with the narrative of “the state advances and the private sector retreats since the 2009 stimulus program” advocated by McGregor (2012) and Song and Xiong (2018), though some other researchers have challenged this view by looking at data on the private sector’s shares in the economy (Chapter 7 of Kroebber, 2020 and Lardy, 2014).

### 4.2.3 Formal vs informal finance

Conventional wisdom, e.g., LaPorta et al. (1998), suggests that well-developed financial institutions such as banks and markets play a critical role in economic growth. In a highly cited paper, Allen et al. (2005) argue that China is an important counterexample to the law and finance literature, as “neither its legal nor financial system is well developed, yet it has one of the fastest growing economies.” Allen et al. (2005) examined three real sectors during the past four decades: The listed sector (a topic covered in Section 3), the (non-listed) SOE sector, and the private sector that includes all other firms with private and local government ownership. Consistent with the law-finance-growth nexus theory (LaPorta et al., 1998), Allen et al. (2005) find that the growth of the first two sectors was slow due to poor legal protections and weak financial markets. However, the astonishing growth of the third sector, which has received credits from nonbank and nonmarket sources, challenges this classic theory. Allen et al. (2005) argue that there exist effective, alternative
financing channels and corporate governance mechanisms to support the growth of China.

This view is challenged by Ayyagari et al. (2010) who study a comprehensive firm-level dataset from the 2013 World Bank Investment Climate survey. Ayyagari et al. (2010) show that bank financing is associated with faster growth; and all firms, irrespective of size, benefit from access to formal financing, as the positive relation between bank financing and firm growth holds even in the non-listed private sector. Ayyagari et al. (2010) hence conclude that reputation and relationship-based informal financing is likely to be limited and unlikely to substitute for formal mechanisms.

What drives the discrepancy between Allen et al. (2005) and Ayyagari et al. (2010)? Allen et al. (2019b), as a response to Ayyagari et al. (2010), provides an answer. Even though the 2013 survey questionnaires constructed by the World Bank cover many financing sources, the largest financing component (37–41%) for Chinese firms is “others.” Allen et al. (2005) classify this unidentified “others” part as informal financing, while Ayyagari et al. (2010) consider this component to be internal financing. Allen et al. (2019b) show that this largely reconciles the seemingly contradictory results in Allen et al. (2005) and Ayyagari et al. (2010).28

Allen et al. (2019b) further separate two kinds of informal financing. Depending on the exact mechanism for dealing with asymmetric information and enforcement, one could have constructive informal financing, such as trade credits and family borrowing that benefit from information advantages, or underground financing, such as loan sharks that have little information technology to rely on but coercion or violence when borrowers default. As a main takeaway, Allen et al. (2019b) warn that ignoring heterogeneities in nonbank lending might have contributed to the under-acknowledgment of the role of informal financing in China.

4.2.4 Recent banking research based on loan-level data

More recently, researchers have taken advantage of administrative loan-level data and studied some fundamental questions—e.g., information flow in bank-firm networks, political economy in banking lending—that are of general interest to economists.

Haoyu Gao and Xiaoguang Yang, with the access to a comprehensive loan-level dataset,29 have

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28 Allen et al. (2019b) conduct additional field surveys and find that the “others” category captures mostly family/friends borrowing for startups and retained earnings for mature firms.

29 The datasets includes all major bank loans that the CBRC compiled for monitoring and administrative use, covering over 80% of loan contracts granted by the 19 largest Chinese banks from October 2006 to June 2013.
produced a series of interesting papers by working with various coauthors. For instance, focusing on the informational role of interfirm ownership networks in bank lending, Gao et al. (2021c) show that banks’ internal loan ratings at issuance predict subsequent delinquent events more accurately when borrowers are connected to banks’ existing customers via ownership networks. In another paper, Gao et al. (2021b) study how deregulation on bank entry barriers during 2009 alters China’s local banking industrial organization and its economic consequences. We will mention other papers that use this dataset in the next section. Finally, Gao et al. (2021a) paint a politics-finance nexus picture by providing direct evidence that SOEs selectively avoid defaulting on loans extended by the largest policy bank CDB, which has a higher political rank than the Big Five.

As explained in Section 4.1, the CDB, unlike other commercial banks who put profit as one of their primary performance targets, operates under the clear policy mandate to grant subsidized credit to infrastructure projects or to SOEs in strategic industries. Ru (2018) show that CDB loans to SOEs crowd out private firms in the same industry but crowd in private firms in downstream industries, which not only sheds light on the important question of how government-directed credit affects the economy, but also reconciles the mixed results from previous studies that analyze aggregate data only (due to data limitations) in China (Banerjee et al., 2020) or other countries (e.g., Gale, 1991 in the U.S.).

4.3 Shadow Banking

According to the PBC, shadow banking refers to “credit intermediation involving entities and activities outside the regular banking system that serves to provide liquidity and credit transformation and which could potentially be a source of systemic risk or regulatory arbitrage.” As we will review in this section, shadow banking in China takes a multi-faceted form and should be more generally defined as markets and/or institutions that operate partially outside the traditional commercial banking sector with lighter regulations.

We first explain the commonalities, as well as distinctive features, of shadow banking in the Chinese financial market when compared to those in other developed countries. We then review several articles that are specific to certain shadow banking products, then discuss the literature on the connection between shadow banking and the Chinese economy.
4.3.1 Shadow banking in China: What is different?

From the broader context of shadow banking sectors worldwide, we highlight two common themes as well as two unique features of China’s shadow banking sector. First, as argued in Chen et al. (2020), the upsurge of shadow banking is typically linked to rising financing demands from certain real sectors, with one such leading historical example being the popularity of state-chartered trust companies in the U.S. in the late 19th century associated with the large-scale railroad construction at that time. China is no exception: Zhu (2021) argue that shadow banking activities, which were initiated by banks prior to 1996, helped direct credits to the more productive nonstate sector whose growth craved funding.

Regulatory arbitrage is the second feature that Chinese shadow banking shares with the rest of the world. As highlighted in an excellent review article by Hachem (2018), shadow banking is credit intermediation that occurs outside the regulated sphere in response to the sufficiently stringent regulation; blatant regulatory arbitrage takes place either when systemically important U.S. banks actively set up asset-backed commercial papers conduits before the 2007–2009 financial crisis, or when Chinese non-Big-Five banks made off-balance-sheet loans via trust companies after 2010.

Shadow banking in China is also quite unique. First, unlike in other developed countries, almost every aspect of shadow banking activities in China—as manifested by all the papers reviewed in this article—can be traced back to its mammoth banking system; as put by Amstad and He (2019) and echoed by Sun (2019), “Chinese shadow banking is literally just the ‘shadow’ of commercial banks.” Ehlers et al. (2018) provide a holistic picture of the shadow banking sector and its inter-linkages to the entire financial system in China, highlighting the dominant role of commercial banks as the defining feature of shadow banking in China. This stands in great contrast to its U.S. counterpart where secularization and market-based instruments play an important role.

Another central feature of China’s shadow banking sector is the prevalence of implicit guarantees that investors come to expect for returns on risky investments. Unlike the fixed-income products offered in the western developed financial markets, “bond-like” investments in China, including trust products and WMPs, carry implicit guarantees from their issuers, underwriters, regulators, and even different levels of governments. As put in Zhu (2016), “many investors believe
that, as long as the (issuers and) financial institutions are concerned with their reputations, as long as the regulators are concerned with career advancement, and as long as the Chinese government is concerned with social stability, they will take care of the risks that investors themselves should bear when investing in such products.” Although implicit guarantees are not necessarily unique to China, as the case of Fannie Mae and Freddie Mac in the U.S. illustrates, the degree of implicit guarantees—or investors’ perceived implicit guarantees—is likely more severe for the Chinese economy given its more widespread links to the government. As emphasized by Song and Xiong (2018), implicit guarantees are rooted in the soft budget problems (Kornai, 1979, 1980) and are key to understanding risks in China’s financial system.

### 4.3.2 Shadow banking activities

**Trust products.** As the largest nonbank financial industry in China since 2012, trust companies are non-deposit-taking institutions—and hence less regulated than traditional banks—that raise funds through the issuance of investment products to investors. Typically, these investment “trust” products are risky, but Chinese investors expect implicit guarantees, presumably provided by the trust companies or banks that underwrite these trust companies, as just mentioned in Section 4.3.1. Focusing on implicit guarantees which are one of the central features of shadow banking in China, Allen et al. (2021a) analyze a comprehensive dataset of trust products from 2002 to 2015, and document that the pricing of trust products (i.e., the promised yield) depends on both the underlying investment risk as well as the strength of the implicit guarantee. For instance, yield spreads are lower if the trust firm is larger or controlled by a state-owned enterprise (SOE), or if the product is sold via the Big Five. And, following the first high-profile near-default of a trust product in 2014 as a shock to the perception of implicit guarantees, spreads increased but the effect was concentrated among products with lower-strength guarantees.

**Entrusted loans.** Different from trust loans, entrusted loans are firm-to-firm loans that use traditional financial intermediaries as trustees; see Section 2.1 for more details. Allen et al. (2019c) manually collect transaction-level data on entrusted loans from publicly listed firms during the period 2004–2013, thanks to the disclosure requirement mandated by the CSRC; a similar dataset

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30See Section 7.1 in Allen et al. (2021a) for more background details of this default event.
is also used in Chen et al. (2018). Allen et al. (2019c) document two types of entrusted loans: affiliated loans, which are essentially pass-through loans between related parties at rates that are close to the official bank loan rate (which was about 6% in the sample period); and nonaffiliated loans, which are done at arm’s-length with borrowing cost reflecting the market rate (which was about 14%). Unlike affiliated lenders who tend to have high profitability, lenders of nonaffiliated loans have low growth rates; they essentially use entrusted loans to act as credit intermediaries, pocketing immediate interest rate differential of 8%. In short, entrusted loans involve firms with privileged access to cheap capital (such as large SOEs) channeling funds to less privileged firms (such as private small-medium enterprises), pointing to inefficiency in the Chinese banking system.

Wealth management products. Using a proprietary dataset that covers the largest 25 commercial banks during the period of 2007–2014, Acharya et al. (2021) study WMPs, which are short-maturity off-balance-sheet substitutes for deposits. As explained in Section 4.2.2, the Big Five were instructed to extend loans to LGFVs in 2009; Acharya et al. (2021) argue that one large state-owned bank, driven by the personal preferences of its president, was particularly willing to make stimulus-related loans, raising deposits aggressively to finance these loans. The authors then instrument deposit availability with banks’ exposure to competition from this large state-owned bank, and show that their issuance of WMPs exposing them to future rollover risk (He and Xiong, 2012).

Heightened rollover risk is further studied in Huang et al. (2020a), who show that banks perceived to be riskier strategically provide stronger implicit guarantees to their issued WMPs, for building reputation and reducing rollover costs. For each WMP, Huang et al. (2020a) construct its “shortfall,” which indicates whether this WMP’s realized return falls short of its highest target return promised by the issuer bank, and find that about a quarter of WMPs experienced return shortfalls in their sample. By directly measuring (the absence of) implicit guarantees, Huang et al. (2020a)’s method is an important improvement over that of Allen et al. (2019c) who can only measure expected implicit guarantee indirectly.

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31 For instance, a parent firm and its subsidiary, a customer and a supplier, or between partners of joint ventures.
4.3.3 Shadow banking, real economy, and policy implications

The intersection between shadow banking and the Chinese economy has received growing attention in the literature. We review two papers here; for a comprehensive review as well as informative institutional details, see Hachem (2018).

Chen et al. (2018) provide an excellent overview on the institutional background of China’s quantity-based monetary system, its regulations on commercial banks, and the relationship between shadow banking and traditional banking. Using a dataset on entrusted loans similar to Allen et al. (2019c), Chen et al. (2018) show that contractionary monetary policy during 2009–2015 in China stimulated shadow banking and encouraged banks to bring shadow banking products onto their balance sheets via account receivable investment, hampering the effectiveness of monetary policy. This is consistent with the underlying reason why PBC introduced the concept of AFRE in 2011 (see Section 2.2).

Chen et al. (2020) argue that the accelerated growth of China’s shadow banking after 2012 is tightly linked to its 2009 stimulus plan reviewed in Section 4.2.2. Although the dawn of shadow banking in China around 2008 can be attributed to other factors (Hachem and Song, 2021), it is only after 2012 that China’s shadow banking started experiencing accelerated growth: WMPs grew by a total of RMB 3.5 trillion during the three-year period from 2008 to 2011 but increased by RMB 2.5 and 3.1 trillion in the single years 2012 and 2013, respectively; and a similar pattern holds for both trust and entrusted loans. The analysis of Chen et al. (2020) focuses on municipal corporate bonds (MCB, 城投债), which are bonds issued by LGFVs, to support infrastructure investment at both the provincial and the city level (Section 4.2.2). The authors use cross-sectional variation to show that MCBs rose quickly around 2014 as a way to refinance stimulus-era loans, and provide aggregate evidence that WMPs have been investing heavily in MCBs, which have become an increasingly important financing source for local government infrastructure investment. We will return to this paper later in Section 5.2 which covers corporate bond markets in China.

32 There is a slight difference between these two datasets. Chen et al. (2018) collected entrusted loan transactions based on all announcements, while Allen et al. (2019c) collect the same information from these firms’ annual reports (and cross-checking these transactions with public announcement). We prefer the method by Allen et al. (2019c) as only annual reports are audited.
5 Bond Market

Over the past twenty years since 2000, especially the past decade, China has taken enormous strides to develop its bond markets as an integral step in making financial reforms. For readers who are interested in the historical background and institutional details (e.g., trading protocols and regulatory agencies) of the Chinese bond markets, see Amstad and He (2019) and Hu and Wang (2022). Two additional articles are worth mentioning here. Huang and Zhu (2009) provide a detailed account of the history Chinese bond market since 1911, which covers the post-1978 reform era as well as the early development stage between 1990 and early 2000; while Mo and Subrahmanyam (2020) focus on the period between 2010 and 2019, arguing that government policies as well as foreign investors have had significant impact on the liquidity of the Chinese bond market.

This section covers two major topics of Chinese bond market: the co-existence of two segmented bond markets, and corporate bonds. We leave out other important topics in this review article; Section 2 in Hu and Wang (2022) provides an excellent review of the literature on Chinese Treasury bonds and their pricing, while Section 5 in Amstad and He (2019) covers the literature on credit rating agencies and bond ratings in China.

5.1 Segmented Markets

As explained in Amstad and He (2019), there are two distinct and largely segmented markets in today’s Chinese bond markets: the quote-driven, over-the-counter, “wholesale” interbank market; and the order-driven, centralized, “retail” exchange market.

The exchange bond market, which is more retail-driven, resides within the Shanghai and Shenzhen stock exchanges, which were established in 1990 in the wake of the SOE reforms (Section 3.1); its participants include non-bank financial institutions, corporate investors, and retail investors (mainly high net-worth individuals). In contrast, the interbank market, which is more wholesale-driven, was established by the PBC in June 1997; by the end of 2021 it hosted 4,158 financial institutions, including commercial banks, urban and rural credit cooperatives, and non-bank financial institutions (such as mutual funds, insurance companies, and securities firms).

The exchange market has aggressively competed with the interbank market; one product of this competition is dual-listed bonds. Due to severe market segmentation documented in Chen
et al. (2021), dual-listed bonds could show different prices despite the same fundamentals. Liu et al. (2019a) show that dual-listed bonds with higher demand from retail investors are traded at significantly higher prices in the exchange market than the same bonds traded by institutional investors in the interbank market.

Taking advantage of another institutional feature that the two segmented markets have different rules for repurchase agreement (repo) transactions, Chen et al. (2021) identify the value of asset pledgeability, which is a challenging task due to the endogeneity of asset pledgeability itself. The authors use a policy shock in December 2014, which rendered a class of AA+ and AA bonds ineligible for repo at the exchange market, to study the value of pledgeability in bond pricing.

5.2 Corporate Bonds

Similar to the banking system and stock market, the corporate bond market plays an important role by channeling household savings toward the real sector in China. At the end of 2021, the outstanding corporate bond balance in AFRE was RMB 29.93 trillion, comparing quite favorably to RMB 9.48 trillion in the stock market but still significantly behind RMB 193.77 trillion in bank loans. Given its growing importance, the literature on Chinese corporate bond market is nascent but expanding fast.

5.2.1 Municipal corporate bonds (MCBs)

Several papers study MCBs, a type of corporate bonds issued by LGFVs that carry out infrastructure investment on behalf of local governments in China (Section 4.3.3). Related to the discussion on implicit guarantee in Section 4.3.1, MCBs are a perfect example of the mixture between planning and the market in the contemporary Chinese economy: They have the implicit backing of the corresponding local government (hence the name “municipal”), but in a strict legal sense they are issued by LGFV entities just like other regular corporations (hence corporate). Consistent with this view, both Ang et al. (2019) and Liu et al. (2021a) show that credit spreads of MCBs depend not only on the financial conditions of the issuing LGFVs, but also on the fiscal conditions of municipals that back the issuing LGFVs.

As reviewed in Section 4.3.3, Chen et al. (2020) connect the dramatic growth of MCBs during the period of 2012–2015 to the 2009 stimulus plan. Consistent with Ehlers et al. (2018) who show
that bond market has become highly dependent on funding channeled through WMPs, Chen et al. (2020) provide evidence that WMPs invest heavily in MCBs to support infrastructure investment. Considering that WMPs offered households an attractive savings vehicle with market-based interest rates (see, e.g., Buchak et al., 2021), Chen et al. (2020) take a positive view on the stimulus hangover effect: As an unintended (but good) consequence, the 2009 stimulus plan served as a catalyst for the development of China’s corporate bond markets three and five years later.

5.2.2 Default of corporate bonds

Another fast growing literature concerns the rising corporate default in China. Li and Ponticelli (2021) study the recent progress of bankruptcy resolution in China, which has important policy implications. More specifically, based on a case-level dataset between 2011 and 2020, Li and Ponticelli (2021) compare bankruptcy cases handled by specialized versus traditional civil courts, and argue court specialization increases efficiency via selection of better trained judges and greater judicial independence from local politicians.

Based on the same structural framework of credit risk modeling (Merton, 1974), Geng and Pan (2021) study long-term corporate bonds and find that credit spreads in China become informative only after the first corporate bond (Chaori) default in 2014. Focusing on short-term bonds, Huang et al. (2022) take the framework of He and Xiong (2012) and show that liquidity is much more important than default risk for explaining variation in the spreads of short-term commercial papers.

As emphasized in Section 4.3.1, corporate bonds in China may carry implicit government guarantees, especially for those issued by SOEs. As shown by Geng and Pan (2021), amid a wave of default events after 2018, non-SOE issuers have experienced a much larger increase in credit spreads, relative to SOEs. However, the implicit guarantee is not “guaranteed”; Jin et al. (2022) study the first large SOE (Baoding Tianwei) default in 2015, and show that following this shock SOEs reduced their investments relative to matched non-SOEs.

5.2.3 Corporate bond issuances

Several recent papers focus on corporate bond issuance. Ding et al. (2021) discover a robust overpricing in the primary interbank market in China; driven by rebates and self-purchases by underwriters, the surprising issuance overpricing stands in sharp contrast to issuance underpricing
in developed financial markets (Ritter and Welch, 2002; Cai et al., 2007).

Expanding the scope to offshore corporate bond markets, Huang et al. (2021c) show that offshore USD-denominated Chinese corporate bond issuance is driven by the wedge between the domestic and foreign interest rates. Somewhat surprisingly, the authors find that firms in risky sectors use the proceeds to do more entrusted inter-firm lending, consistent with Allen et al. (2019c). From a different angle, Flannery et al. (2022) show that the issuance of two USD-denominated sovereign bonds issued by the Chinese government in 2017 helped reduce yield spreads, bid-ask spreads, and volatility of offshore dollar-denominated Chinese corporate bonds.

6 Fintechs

As a global phenomenon, the financial industry has been undergoing radical transformation and restructuring, with incumbent banks facing increasing competition from the rising fintech sector. The rapid development and astonishing growth in China’s fintech sector are particularly remarkable, and this is why we cover this topic in a separate section despite the fact that fintech is not a distinct item for AFRE.

As mentioned in Chen (2016), due to underdeveloped traditional banking, especially the lack of credit access for small/medium enterprises and consumers, the large unfulfilled demand facilitates the entry of fintech firms. But perhaps more importantly, regulators took an unusually friendly approach to the burgeoning fintech industry during the early 2010s; they did not set stifling restrictions to entering core financial service industries such as payment and lending for privately owned companies (Allen et al., 2019a).

The success of Ant Financial provides a good case study and many papers reviewed in this section uses the data from Ant Financial and its parent company Alibaba. Its business model rests on enabling direct interactions among a large number of users on digital platforms, with an essential by-product being a large stock of user data. Ant Financial uses these data as an input to offer a range of services that exploit natural network effects, generating further user activity and facilitating further financial inclusion (Luohan Academy, 2019). However, the development of fintech in China is not without potential concerns, as we will review soon.
6.1 Fintech Lending and Big Data

Fintech lenders, beyond their automated services, have revolutionized the way we collect and use credit information, by innovating alternate data and machine learning technologies. The success of Ant Financial and Alibaba in the past decade drives a burgeoning literature on the role of creation, processing, and use of big data in fintech lending in China. Using data from Ant Financial, Hau et al. (2019) show that big data technology helps fintech promote inclusive financing, in that fintech firms have advantages in making loans to vendors with either low credit scores or who had been previously excluded from bank credit. Hau et al. (2019) extend this result further and argue financial inclusion matters most for the underdeveloped and largely segmented credit markets in emerging markets.

Hau et al. (2021) analyze automated credit lines by Ant Financial to vendors on Alibaba’s online retail platform (Taobao). Using a discontinuity in the credit decision algorithm, Hau et al. (2021) show that a vendor’s credit approval and credit use boost its sales and transaction growth. Interestingly, Hau et al. (2021) report that the proximity to Big Five bank branches correlates positively with the take-up of fintech credit. This implies that vendors face greater credit frictions when closer to Big Five banks, consistent with the notion that the traditional banking system in China hurts financial inclusion.33

Screening borrowers is only one of the many critical steps during which fintech lenders utilize big data technology. Using a large sample of personal loans from a fintech lender in China, Dai et al. (2020) show that the information acquired by the lender through borrowers’ digital footprints can significantly increase repayment likelihood on delinquent loans; this is true even under stringent privacy protection regulations and fair debt collection practices. Digital footprints, which serve as a new type of collateral, therefore can enhance financial inclusion by facilitating the lender’s collection of delinquent loans.

Pushing further this idea of “data as a new type of collateral for fintech lending business,” Gambacorta et al. (2022) compare Ant Financial’s lending practices to those of traditional commercial banks, which typically rely on physical collateral (say, land). Using a unique dataset of Chinese firms who received credit from both Ant Financial (more specifically, MYbank) and tradi-

33Based on the same dataset and methodology, Huang et al. (2021b) show that access to credit allows vendors to provide better services,
tional commercial banks,\textsuperscript{34} Gambacorta et al. (2022) show that fintech loans do not correlate with local business conditions and house prices, but react strongly to changes in firm characteristics, such as transaction volumes and network scores (both serve as important inputs of firms’ credit ratings developed by Ant Financial). In sharp contrast, bank credit is positively correlated with local house prices, consistent with the classic “collateral channel” a la Kiyotaki and Moore (1997). By showing that fintech credit is less reliant on traditional collateral, this paper may have profound implications for potential transmission mechanisms of an effective monetary policy in China.

6.2 Financial Disruption and Economic Implications

By challenging incumbent financial institutions with new business models, the rising fintech sector in China has the potential to disrupt the traditional Chinese financial system, with profound implications on both macro- and microeconomic policies.

Buchak et al. (2021) argue that the fintech sector is an important economic force that drives interest rate liberalization in China. Using proprietary data from Ant Financial, Buchak et al. (2021) study fintech’s role in ending “financial repression” in China via the introduction of a money market fund with deposit-like features. Cities and banks whose depositor base is more exposed to fintech see greater deposit outflows, and they respond to fintech competition by offering competing products with market interest rates. As put by Buchak et al. (2021), fintech thus facilitates a “bottom-up” interest rate liberalization, with important monetary policy implications to China.

Indeed, Huang et al. (2021a) study loan-level data from a P2P lending platform, and find that monetary policy easing is associated with a higher probability of granting loans to risky borrowers and greater riskiness of credit allocation. Furthermore, fintech lenders represent a type of new, lightly regulated financial intermediary. Braggion et al. (2021) analyze P2P lending around a tightening of mortgage loan-to-value caps in several cities in China in 2013, and provide evidence in which home buyers borrow from online P2P platforms to bypass the tighter loan-to-value cap.

Fintech industry underwent tremendous growth during the COVID-19 crisis across the globe. Bao and Huang (2021) compare fintech and bank loan records during the outbreak of COVID-19 in

\textsuperscript{34}The dataset used by Gambacorta et al. (2022) is worth highlighting. The fintech lender is MYbank under Ant Group, and the dataset covers a random sample of more than 2 million firms during 2017–2019. Unlike the previous literature (say, Hau et al. (2021)), the sample contains not only online firms that reside on Alibaba’s e-commerce platforms but also offline firms who merely use Alipay and conduct traditional businesses.
China, and find that fintech lenders are more likely to expand credit access to new and financially constrained borrowers after the start of the pandemic. But the increased credit provision may not be sustainable; the delinquency rate of fintech loans triples after the outbreak, in contrast to a steady delinquency of bank loans. On the government policy side, during the summer of 2020 several Chinese local governments launched a consumption stimulus program, which leverages mobile payment platforms to dispense small-value, use-it-this-week-or-lose-it coupons. Exploiting participants’ rush to the first-come-first-served digital portal, Xing et al. (2021) and Liu et al. (2021b) compare spending among those who won coupons to those who just lost and find that coupons generate an immediate increase in weekly consumption among winners by RMB 3-6 out-of-pocket spending for every RMB 1 in government subsidy. Their study suggests that the coupon program, which delivers a much larger MPC than traditional policies in the U.S. (e.g., Johnson et al. 2006), can be a useful addition to policymakers’ stimulus toolbox.

6.3 Peer-to-Peer Lending Platform

Peer-to-peer (P2P) lending allows individuals to bypass traditional financial intermediaries and raise funds directly from investors, with the potential to provide alternative funding to small businesses in China. Outstanding P2P loans in China went from almost nothing in 2007 to a peak of RMB 1.317 trillion in June 2018, only to have collapsed due to pyramid-scheme scandals and absentee bosses, sparking public anger as well as a broader government crackdown.

He and Li (2021) provide a comprehensive analysis for why P2P platforms failed in China. The original business model of P2P platforms is to charge a service fee for connecting borrowers and lenders; lenders cannot appeal to the platform for payment if a borrower defaults. However, since the Chinese government initially took a light regulatory touch during 2015–2017 as mentioned in the beginning of Section 6, most Chinese P2P platforms guarantee their investors a return, which obligates the platform to pay back a loan if it goes south (see implicit guarantee in Section 4.3.1). Moreover, platforms themselves issued short-term WMPs that came with a promise of high returns (Li et al., 2020a). P2P platforms, which essentially engage in credit and maturity transformation like traditional banks, became a breeding ground for risky lending and fraud. In November 2019, Chinese authorities mandated that all existing P2P lending platforms must be converted to micro-lending companies within two years, essentially eliminating the P2P industry in China.
P2P platforms themselves need financing. Jiang et al. (2021) show that P2P platforms with SOE affiliations have higher trading volumes, attract more investors, and offer lower interest rates. Using a clever identification strategy of fake SOE affiliations, the authors demonstrate that the SOE affiliation itself (not related to the fundamentals) serves as a positive signal. Relatedly, Li et al. (2020a) show that the number of lenders increase significantly immediately after P2P lending platforms obtain venture capital investment, supporting the view that the certification effect of venture capital on the P2P industry.

7 Conclusion

We provide a comprehensive review on the recent literature covering China’s financial system, which has become increasingly intertwined with the astonishing growth of the Chinese economy in the last two decades. Unlike most existing survey articles, this review is structured based around aggregate financing to the real economy (AFRE), a broad credit measure released by the PBC that includes bank credits, equity and bond issuances, as well as various shadow banking items like trust and entrusted loans. Besides placing the development of China’s financial markets in the broad context of SOE reform, a common theme in China’s economic transformation during 1990s and mid-2000s, our review highlights that non-bank-credit, which represents new market-based financing channels, plays an increasing role in supporting the real economy. Furthermore, all these new financing channels were more or less affected by the hangover of the 2009 four-trillion stimulus plan, and are often ultimately tied back to the dominant banking sector with “implicit guarantee” in almost every layer. As a result, understanding the mechanisms behind these financial channels and their intrinsic connections is crucial to alleviate the distortion in capital allocation and mitigate potential systemic financial risk in China.

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