

The interconnectedness between traditional banks, shadow banking and non-performing loans in the Chinese economy

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Abstract

During the last few decades, China has been developing traditional banking in parallel to the shadow banking sector. The unregulated part of the Chinese financial market is strictly interconnected with traditional banks. It was especially visible after the financial crisis of 2008–2010, when shadow banking helped to fuel the economy with debt on a large scale. The excessive investments in some sectors of the Chinese economy contributed to the growth of NPLs in traditional banks. Shadow banking being entangled with the formal Chinese banking sector might be enumerated among the crucial causes of the process. The authorities and regulating bodies implemented many measures aimed to limit the amount of bad debt, together with limiting the operations of shadow banking entities, but the final result of these activities is still unknown. It might be predicted that the level of NPLs will not be constrained in the near future.

Keywords: Chinese banking sector, non-performing loans, shadow banking

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1 Introduction

The financial market in every country is an important determinant fostering economic growth. However, it can be harmful for the real economy if the development of the financial market conceals excessive risks. A very good example of such dependence is the Chinese economy. The rapid growth of this economy is closely intertwined with the banking sector and very fast developing shadow banking system. Shadow banking plays the same important role in China as the traditional banking sector, mainly due to the limits for small and medium businesses on access to credits from traditional banks. The system is responsible for financing many sectors of the Chinese economy, e.g. real estate, local government infrastructure etc.

The formal and informal (shadow) financing in the Chinese economy has caused a problem with excessive debt. It is estimated that the total debt (including all categories of debt: government, corporate and household) to GDP in China already exceeded 250% (Figure 1). It puts China among the ten most indebted countries in the world (according to BIS statistics). The Chinese debt is mostly created by the corporate sector and local governments, which is a major difference when compared to other most indebted countries where public debt prevails. This category of debt does not have state guarantees. Simultaneously non-performing loans (NPLs) are on the rise, which potentially increases the risk of default (McCrum 2018). The most endangered branches include the manufacturing industry, the construction industry and the real estate. The situation triggers a risk of default for many businesses and poses a threat to the whole Chinese banking sector.

Chinese authorities, among them the People's Bank of China (PBoC) and the China Banking Regulatory Commission (CBRC), implemented some regulations aimed to restrain the risk of excessive debt, curb NPLs' growth, and limit the stake of shadow financing. They are, however, very often in-effective. The mechanisms of financing the Chinese development are based on the needs of the economy's entities, whereas the regulations are not always precisely tailored to the situation, but rather reflecting the central government's political expectations.

The aim of this article is to analyze the non-performing loans (NPL) in China from the viewpoint of the bank and non-bank financial sectors. We argue that:

1 Despite the rapid development of traditional banking in China, the non-regulated part of the financial market (shadow banking) plays an important role in the Chinese economy and is closely interconnected with the traditional banking sector in the country.

2 The rapid development of the non-regulated part of the financial market in China contributes to the growth of NPLs in traditional banks.

3 The financial regulations implemented in China have not eliminated NPLs in the economy.

The article is mainly theoretical in its approach, but part 5 provides empirical evidence of NPLs in selected sectors of the Chinese industry. It contributes to the existing literature by highlighting the interconnectedness between traditional banks and shadow banking in China, and their impact on NPL growth.

2 Structure of the banking sector in China

The Chinese economic reforms introduced by Deng Xiaoping after 1978 have triggered the development of the banking sector in the country. Since the very beginning the sector was treated as an important

tool used by the authorities for the process of creating a market economy with Chinese characteristics (Choi, Powers, Zhang 2016). The process of the development of the Chinese banking sector consists of three phases:

- 1978–1991 – the creation of a market-driven banking system,
- 1992–2000 – further development of the banking system,
- 2001 – onwards – further development, commercialization and modernization of banking and the creation of a shadow banking system (Okazaki 2007).

The first phase might be characterized by a process of revitalization of banking institutions and can be associated with the “reform and opening policy”. The major aim at this stage was transforming the Soviet-style mono-banking system into market-driven banking, characterized as multi-ownership, competitive and profit-oriented (Chow 2004, pp. 131–132; Luo 2016, p. 1). In 1978, the People’s Bank of China functioned as both, the central bank of the country and the only commercial bank. Between 1978–1984, four state-owned banks were separated out from the PBoC: the Bank of China (BOC), the Agricultural Bank of China (ABC), the China Construction Bank (CCB) and the Industrial and Commercial Bank of China (ICBC) (Elliot, Yan 2013, p. 19). They were set up with the aim of providing lending to strategic sectors of the economy.

Between 1986–1991 the process of establishing new banks continued and the institutional structure of the Chinese banking sector kept changing. It was stimulated indirectly by the authorities whose intention was to modernize the system in order to reduce concentration and foster competition in the banking sector. During the period five joint-stock commercial banks were established: Bank of Communications (1986), China Merchant Bank (1987), China International Trust and Investment Corporation Bank (1987), Fujian Industrial Bank (1988, later Industrial Bank), Guangdong Development Bank (1988, later China Guangfa Bank) (Si 2015, pp. 190–192). It is important to highlight that the shareholders of these banks, beside the central government, included local governments and state-owned enterprises. As a result a group of joint-stock commercial banks was established and its goal was to offer banking services to households and business. In 1980s the authorities promoted funding to small and medium-sized enterprises which had been excluded before from state-owned banks’ lending. The funding was made possible by the development of city commercial banks. The new policy created an opportunity for growth in rural areas as well, promoting the development of rural commercial banks (Borst 2015, p. 2; Barth, Li, Song 2015, p. 349).

The second phase of banking sector development began in 1992 and is associated with the slogan of “socialist market economy”. The banking reform which was initiated in 1993 was strictly related to the programme of opening up the Chinese economy. During this phase the PBoC became a crucial institution able to influence the whole banking system. This led to increased independence of state-owned banks from the government (Mehran et al. 1996, p. 2; Fang, Jiang 2016, 328–329).

Other changes linked to the commercial aspect of the banking activity were implemented after 1994, when three state-owned banks were established: the State Development Bank, the Import-Export Credit Bank and the Agriculture Development Bank. On the one hand it was a sign of substantial progress in commercialization of banking activity in China, on the other hand it led to the separation of commercial credit activity from government lending policies. The newly established three banks were responsible for state lending to the economy, especially in areas such as domestic infrastructure and construction projects in strategic sectors of industry, international trade activity and rural development (Mehran et al. 1996, pp. 13–14). During the following years some attempts were made to increase their independence in commercial lending.

Beside the establishment of the three above-mentioned banks, the most important processes during the second phase of the Chinese banking development involved changes and transitions in the structure of local banks, e.g. in the second part of 1990s the urban credit cooperatives were transformed into city commercial banks (such as the Beijing Commercial Bank, the Shanghai Commercial Bank and the Shenzhen City Commercial Bank), some rural cooperatives were transformed into rural commercial banks, etc. The whole process of transforming the banking system in the 1990s led to the creation of an extended structure of the banking system in China (Tam, Liang, Chang 2016, p. 170; Luo 2016, p. 4).

The third phase of banking sector development is connected with the “Go global” strategy announced by the Chinese authorities in 2001 and China joining the WTO in the same year. This period was associated with further development, commercialization and modernization of the banking system. The processes of privatization and financial liberalization played a very important role. Since 2003 state-owned commercial banks began their joint-stock reform. The main purpose of the reform was to establish a competitive banking system in China. Banks improved their capital adequacy requirements, corporate governance, financial risk management, changed their ownership structure through progressive engagement of foreign strategic investors and finally began to finance themselves by stock issuance on capital markets (Jiang, Yao 2017, pp. 20–26).

The process of banking commercialization also involved a reform of policy banks and postal banks. This entailed further transformation of some banks. In 2008 the State Development Bank was transformed into China Development Bank and restructured into a joint-stock commercial bank. In 2012 Postal Savings Bank of China was transformed into a joint-stock ownership entity and began to be listed on the Hong Kong Stock Exchange. It was a significant step leading to the separation between postal offices and postal banks. The commercialization has fulfilled the growing demand for financial services in rural and urban areas, especially on part of local communities, agribusiness and small enterprises. Market gaps, created by the shortage of some services, like microcredit financing for households, financial services to small and medium-sized enterprises, farmers and other disadvantaged groups, were plugged by new-type financial institutions, such as village and township banks, lending companies and rural mutual cooperatives (Martin 2012, p. 19; CBRC 2012, p. 33; Tan 2016, p. 42).

All of the described processes led to the contemporary structure of the Chinese banking system which in 2015 consisted of the central bank – People’s Bank of China and about 4 thousands banking institutions (Table 1). The sector was dominated by the five largest commercial banks: Industrial and Commercial Bank of China (ICBS), China Construction Bank (CCB), Agriculture Bank of China (ABC), Bank of China (BOC) and Bank of Communications (BOCOM). These banks were still under the control of the State Council (a central government institution). They were responsible for loan provision to state-owned enterprises and major branches of the Chinese industry. An important feature of the five largest banks is that they are operating globally, they are listed on the stock exchange, and they belong to the biggest global financial institutions rated by the Financial Stability Board as systemically important financial institutions (Borst 2015, p. 2; FSB 2016, p. 3).

Nowadays, a very significant role is being played in China by two policy banks and the China Development Bank. They represents about 10% of banking assets in the country. These banks are permitted to participate in commercial lending and policy lending. Beyond them a very important role in the Chinese economy is played by two types of private commercial banks: joint-stock commercial banks and city commercial banks. There are about 150 commercial banks: 12 joint-stock commercial banks and 133 city commercial banks which represent about 30% of the banking assets (Table 1).

The joint-stock commercial banks operate nationwide and provide financing for small and medium-sized enterprises. City commercial banks are oriented more towards supporting the regional economy, financing local infrastructure and some government projects. Small and medium financial institutions in China consist of both rural cooperatives and new-type financial institutions. They have about 16,5% of the market share (measured by their share in total assets). The most important institutions in this group are rural credit cooperatives, rural commercial banks and village or township banks. Apart from the various categories of banks, the Chinese banking sector includes also some non-bank financial institutions (trust companies and leasing companies), however, they are less significant (3.3% of banking sector assets).¹

It is important to highlight that nowadays the world's four largest banks are Chinese institutions. China's entry into the WTO in 2001 began the period of a progressive opening up of the banking sector in the country to international activity. Since 2003 foreign banks gained limited access to the local market and in 2006 all restrictions for them were finally removed, which constituted a very important stimulus for Chinese banking development (Garcia-Herrero, Gavila, Santabarbara 2006, pp. 319–320). Such banks as the ICCB, the CCB, the ABC and the Bank of China focus their attention on capital markets' activities, e.g. acquiring assets of foreign companies and investing on international capital markets. During the last decade they continue an aggressive strategy of overseas expansion (Perkowski 2012; Chen 2013).

3 The role of shadow banking in the Chinese economy

Besides the traditional financing, very important alternative funding for the real economy in China comes from shadow banking. Shadow banking, as per definition, is the banking type activity, conducted by firms which are not banks and which are not regulated by the banking law. The official definition provided by the Financial Stability Board states that “shadow banking is a credit intermediation involving entities and activities outside the regular banking system” (Lemma 2016, p. 18). It must be highlighted that the term ‘shadow banking’ can mean different things in different jurisdictions. Comparing the system in the United States and in China one recognizes that there are fundamental differences between the shadow banking structures in both of the economies. The U.S. financial system is based on capital market, so the shadow banking is a function of the market. In China the financial market is bank centric, what leads to the situation that shadow banking is the reflection of the official, regulated banking system. There are many differences between the shadow banking in European countries and in China as well. Securitization and market-based instruments play a very limited role in China while in Europe they play a significant role. On the other hand, the linkages between the formal banking and shadow banking sectors are stronger in China. It must be highlighted that shadow banking broadens the investment channels for the private sector (Łasak 2018, pp. 409–426). The system in China is based to a large extent on interlinkages between the formal banking sector and non-bank institutions (e.g. trust companies). Traditional banks are at the center of shadow credit intermediation and they are involved in non-standard, high risk products (Ehlers, Kong, Zhu 2018, pp. 7–12).

¹ The non-bank financial institutions should be distinguished from shadow banking. It is estimated that during the last decade shadow banking has represented around 25–30% of the formal banking assets in China (Huang, Bosler 2014; Tsai 2015).

The role of Chinese shadow banking has grown in the 21st century, especially after the global financial crisis of 2008–2010 when the Chinese authorities introduced a contractionary monetary policy. The policy led to constraints in credit availability for many entities, especially small and medium-sized enterprises, and in consequence to a fall in bank loans and deposits. As a result the new regulations triggered the rapid development of shadow banking, which became an alternative source of financing for enterprises with credit constraints.

Apart from the impact of the crisis, the most important determinants of the Chinese shadow banking are the still underdeveloped credit market and the strict regulations of the traditional banking activity. The concentration of bank activity on big state companies left the large part of the retail market to non-bank financial institutions, most of which belong to the shadow banking sector. The Chinese shadow banking sector consists of institutions like trust companies, leasing companies, pawn shops, insurance firms and informal lenders. They offer access to credit to retail clients. The most important instruments of shadow banking in China include entrusted loans, wealth management products (WMPs), trust loans (products) and bankers' acceptances.²

With regard to institutions, a key component of the Chinese shadow banking system consists of trust companies. They are financial firms that combine elements of banks and asset managers (Elliott, Kroeber, Qiao 2015, p. 7–18). Such entities operate across the financial system and their main activity is to collect funds from wealthy individuals and companies, and to invest them in a range of credit instruments, very often with higher interest rates and higher risk than normal bank loans. Trust companies are interconnected with banks, which sometimes have ownership stakes in them. It is characteristic that as time passed, banks became ever more involved in cooperation with trust companies, and currently they are the most important funding source for trust assets (Zhu, Conrad 2014, pp. 6–8). Among the non-bank financial institutions trust companies are the biggest, when taking into account the size of asset holdings (Lan 2015, p. 171). The average growth of such companies during the last few years was over 50% per year. On the other hand, cooperation between trust companies and banks creates high risks for the latter. If a trust company makes a loan to a bank client on behalf of the bank, it means that the risk finally will fall on the bank. The trust entities create trust products and trust loans, which enable to raise funds channeled later to risky borrowers. They invest into real estate assets, company shares, mining companies, local government financing vehicles etc.

The most important shadow banking instruments in China include “entrusted loans”, which are forms of lending between non-bank institutions via the official banking system. In the 1990s, in China direct lending between non-bank entities was prohibited (e.g. enterprises, government entities), so banks played an intermediating role for bridging credit between such non-bank entities. Banks became agents whose role was to facilitate loans for corporate and other non-bank entities and such situation is still in place.

Wealth Management Products are another example of shadow banking instruments. They are investment products that provide return based on the performance of a pool of underlying assets, usually a single large loan or a pool of loans. The special importance of these instruments comes from the fact that WMPs are usually offered by traditional banks or trust companies to ordinary investors (Elliott, Kroeber, Qiao 2015, p. 2). Despite being mostly offered by banks such products are not protected, and their profitability is not guaranteed by the related banks or the state, which

² In 2013, off-balance sheet WMPs created 14% of the Chinese shadow lending, entrusted loans 19%, banks' acceptances 18%, trust products (loans) 15%. A significant part of the remaining part belonged to micro finance loans and private lending, LGFVs, leasing etc.

exposes investors to risk. Additionally, WMPs are mostly short-term vehicles created by third parties and only issued through banks. They are very often funded with short-term capital, which makes them vulnerable to a maturity mismatch. It means that their life span is a few months while the projects they finance are often of much larger maturities. The issuers of WMPs need to roll them over continuously to maintain a positive cash flow (Wei 2016, pp. 58–61). The whole process of issuing WMPs means that they are treated as very convenient investment products but at the same time they generate high risk for investors and for the whole economy.

An important role in the Chinese shadow banking system is played by banks' acceptances. These are short-term debt instruments issued by firms and by commercial banks. In the case of traditional banks they are treated as banks' off-balance-sheet lending of sorts. Companies use banks' acceptances as a means of payment, and the instruments are treated as a form of credit guaranteed by banks (Buitelaar 2014, p. 21). Most often they are issued in connection with a non-financial transaction, such as the purchase of goods.

Shadow banking in China has been developing rapidly during the last decade. Actually not only the scale of the system is important, but also its impact on the official banking sector and the risks inherited by the system. Traditionally banks get their funding from customers' retail deposits and treat them as a stable and safe source of funding allowing them to extend their loans. Unfortunately, during the early 2000s, Chinese banks' NPL ratios rose to a very high level (30% of GDP in 2000³). In response the Chinese financial market regulatory authorities implemented a policy aimed to control the deposit and lending rates in the traditional banking sector, which spurred the search for alternative investments by savers and sources of financing by banks. Instead of traditional sources, some Chinese banks began to collect money from other venues, like interbank loans and WMPs and to offer loans with a higher yield. Some of the money comes from shadow banking and this is one of the most important reason of shadow banking development in China (Sheng, Soon 2016, p. 164).

Apart from financing the traditional banking activity, the Chinese shadow banking plays an important role in the credit money creation process in the country. It leads to banks' asset expansion and provides funding for real sectors of the economy. The interconnectedness between traditional banks and shadow banking institutions entails off-balance-sheet banking transactions and involves, in particular, entrusted loans and trust loans created in bank-trust cooperation. Trust companies allow banks to participate in the money market, capital market and alternative investment process. As a result of their activities new credit is created but money supply remains unchanged (Sun 2018). Banks very eagerly participate in the process, motivated by higher returns and regulatory evasion.

The interconnectedness between traditional banks and the shadow banking system is not limited to taking deposits and granting loans but it has a broader nature. The literature identifies three layers of connections between traditional banks and the shadow banking system (Table 2). The first one is related to the off-balance sheet bank's financing, the second to indirect support for banks' lending, and the third refers to non-bank lending. On the basis of the table and the above description the first assertion that shadow banking plays an important role in the Chinese economy and that it is strictly interconnected with the formal banking sector might be confirmed. The close interconnectedness between the two sectors generates risks, and poses a huge threat to the traditional banking system and the whole financial market in China. There are three main types of threats for traditional banks stemming from their links with the shadow banking system.

³ The World Bank statistics, <http://data.worldbank.org/indicator/FB.AST.NPER.ZS?locations=CN>.

The first category of threats for the banking system is generated by the inappropriate behavior of banks which use the interconnectedness with shadow banking as a way of bypassing prudential regulations relating to banks' lending activities. The deterioration of banks' loans (asset quality) extends the risk to these institutions. As a reaction supervisory authorities obliged banks to limit the amount of loans. In response banks applied a practice of repackaging such deteriorating loans into investment securities to avoid recognizing and qualifying their assets as NPLs. The scarcity of data on asset quality is helpful in the process. In this way the risk is growing in the same way as it grew in the United States when banks disguised bad mortgages inside securitized products (Edwards 2016; IMF 2016, p. 18).

The second category of threat for the banking sector in China is connected with the way banks are financing themselves. Banks are net borrowers in the interbank market, which is an important source of their funding. The market can be a stress transmitter in the event of a financial shock. The institutions providing funding for the interbank market are shadow banking entities, e.g. structured WMPs. Additionally funding providers use high leverages in their functioning. All these features imply high risk for traditional banks and their assets.

The third category of threat for traditional banks is connected with money lending activities and with the growing range of banking services. It is of particular importance that banks use trust companies as intermediaries of many of their activities. Despite the professional literature's emphasis on the fact that trusts are separate institutions from banks, there are tight connections between trusts and banks, and trusts are able to put banks very easily in a vulnerable position. Usually trust companies are financed by banks, which use entrusted loans to this end. Then the trusts lend money to other entities (like small and medium-sized enterprises, local governments etc.). If the trust companies face problems, there is a spillover to banks (Liang 2016, p. 153). Another dimension of the lending threat is added by the fact that very often shadow banking participates in financing small and medium companies and local government entities that are unable to access formal lending. Such a category of borrowers is characterized by higher risks than the SOE or government-guaranteed borrowers (Parker 2014).

In general the interconnectedness between traditional banks and the shadow banking system is very opaque. The chains of capital flow nowadays are becoming longer than in the past and they are more complicated. Moreover there is no clear division between traditional banking and the shadow banking system. No supervisory authority is able to fully control shadow banking institutions and instruments and their application. Such institutions as pawnshops, small-loan companies or financing guarantee companies do not have a proper risk management approach. Sometimes it happens that institutions intentionally keep certain problems unreported, which exacerbates risks and causes moral hazard and adverse selection. All threats are transmitted to the regular financial system and it is not possible to build effective firewalls between the regulated and unregulated sectors of the financial market (Sekine 2015, pp. 102–103).

The interconnectedness between traditional banking and shadow banking in the Chinese economy becomes a very important issue. Figure 3 shows the interdependence between the banks' off-balance sheet assets and the NPL rate in banks. Both variables are calculated as a mean of the individual rates for selected 25 banks operating on the Chinese financial market. It is clear that during 2007–2017 there was no interdependence between the two variables. The NPL rate declined between 2007 and 2013 (from over 2% of total assets to less than 1%) whereas off-balance sheet assets remained at a higher level. Moreover, off-balance sheet assets fluctuated in the observed period, which was not reflected in the consistent decrease in the mean of the NPL level. A similar lack of interdependence was observed

from 2013 to 2017. During 2013–2016 the NPL rate increased and at the same time the average of the off-balance sheet assets went down. Since 2016 the situation has changed completely. The NPL rate grew while off-balance sheet assets began to go down.

On the basis of the conducted calculations and the analysis of Figure 3, it is possible to verify the second assertion. The argument that the rapid development of the non-regulated part of the financial market in China (shadow banking) contributes to the growth of NPLs in traditional banks should be rejected. The figure shows that the increasing interconnectedness between the shadow banking sector and traditional banking (which is represented by the off-balance sheet assets) does not contribute to the growth of NPLs in traditional banks.

4 Regulations against the excessive NPL level and shadow banking development

According to the commonly accepted definition, a non-performing loan (NPL) is defined as a loan that is in default or close to being in default. The Chinese authorities formally introduced loan classification to the country's financial market regulation in 1995. Originally the NPLs were divided into three categories (part-due loans, doubtful loans and bad debts). In 2002 the country changed the classification and implemented the universal international standard with four categories of NPLs (special attention, sub-standard, doubtful and loss) (Yong 2014, p. 14). The Chinese approach, however, in some situations is still more liberal than the general approach. It means that a bank policy might determine loans' classification and collaterals and guarantees may reduce the recognized risk of the borrowers. Additionally banks are able to implement their own policies and procedures on the recognition and assessment of collateral. It leads to a situation where although Chinese banks are theoretically obliged to use the international loan classification system, in practice banks have a lot of leeway in deciding when a loan turns bad (Chen, Wu 2015). The situation in a particular bank might be worse than the official NPL classification shows and it is uncertain whether banks' financial statements in fact meet the international standards or do not.

The threats of excessive credits, shadow banking development and NPLs in the Chinese economy caused government reaction intended to achieve stricter control of the financial market. Handling of NPLs has become a top priority over the past decade as they posed a threat to financial and social stability. The first regulatory activity was undertaken in 2010 when CBRC introduced regulations related to direct bank-trust cooperation and channel investments. Then further regulations were implemented related to banks' WMPs (2011 and 2013), trust companies (2014), and some interbank activities (2014). All of them imposed some prudential measures or prohibited risky transactions (Bowman, Hack, Waring 2018). The next wave of regulations has been implemented since 2016. President Xi Jinping has made the reduction of corporate indebtedness a key element of his policy over the last two years (Weinland 2019). The People's Bank of China prepared a new set of regulations and other measures aimed at reducing the risks in the country's financial sector. Their agenda covers the following regulatory and reforming proposals:

- 1) numerous regulations related to some forms of lending;
- 2) inclusion of the off-balance sheet WMPs in macro prudential assessment;
- 3) NPLs' securitization process.

The implemented regulations cover diverse areas of credit activities. The first group of activities is dedicated to the lenders. It refers to the off-balance sheet lending, micro-lending and internet financing, as well as regulations intended to implement the deleveraging process in banking activities. Among such regulations are the directives issued by the CBRC aimed at forcing banks to improve risk management and to limit the sale of complex, high-yielding WMPs to investors. It means that banks have been pressured to stop making shadow loans backed by high-interest offerings (Tham, Miller, Lague 2017; Reuters 2018; Lelyveld 2018). A series of regulations have been implemented by the CBRC with the intention to reduce banks involvement as intermediaries in the entrusted lending business and to bar banks from any complicity in entrusted loans offers made by companies, and from providing guarantees for those loans (Weinland 2018). The regulations related to the risky forms of lending include regulations regarding consumer protection (lending products are communicated to customers together with information about the liability of the banks that issue them), regulations around interest rates and reserve requirements as well as micro-lending, inter-company financing (entrusted loans) and internet financing (Financial Times 2017; Bloomberg News 2017; Reuters 2018).

The increased oversight of the opaque shadow banking sector is one of the most important regulatory trends during the last few years in China. The rapid growth of risk related to excessive lending, short-term funding and interconnectedness between banks, trust companies and other financial intermediaries resulted in the People's Bank of China new approach to risk assessment. In 2016 the off-balance sheet WMPs were included in the Macro Prudential Assessment System for evaluating banks' safety. The intention of the new approach is to punish lenders for excessive shadow bank activity engagement (Wildau 2017). The new approach will help regulators to control credit growth and deleverage the financial system.

NPL securitization is a mechanism used to manage China's excessive debt. The solution was announced by the People's Bank of China in February 2016 and is dedicated to commercial banks. They are allowed to transfer their NPLs off-balance sheets and sell them to domestic and global investors (Weinland 2016). It is a new approach because the existing regulations ban financial institutions from selling their retail NPLs to distressed asset management companies. The intention of NPL securitization is to encourage private capital to participate in the NPL market and allow the elimination of the non-performing assets held in banks' balance sheets. It provides flexibility and liquidity for banks to remove their NPLs. Additionally, the process is treated as a way to attract foreign investors to the Chinese financial market. The mechanism has been applied since 2016 and already in the first year the value of the deals closed exceeded RMB 15 billion. It is estimated that the process will continue to grow in the future (China Daily 2017b; Moody's Investor Service 2017).

It is very important to study whether the regulations implemented in China had an impact on the interconnectedness between formal banking and the shadow banking system in the country. The second question concerns the impact of the regulations on the level of NPLs. Figure 3 shows that the regulation from 2010 related to direct bank-trust cooperation and channel investments had an impact on the level of banks' off-balance sheet assets. A drop of such assets could be observed (between 2011 and 2013) from over 2% to less than 1.5% of the total assets in the Chinese banking industry. The impact was short-term and two years later the level of off-balance sheet assets began to grow, in 2013 reaching the same level as was in 2011. The regulations of 2013 and 2014 (related to trust companies and some interbank activities) had a similar effect on the level of banks' off-balance sheet assets, as the previous regulation. They triggered a fall in the off-balance sheet assets and in 2016 they

stood at a slightly higher level than 1% of banks' assets. Despite all the efforts, since 2016 the assets have begun to grow and in 2017 reached the same level as in 2011. The second variable, the level of NPLs in the Chinese banking system was not correlated with the implemented regulations in the same way as banks' assets were. The NPL level dropped in 2007–2013 regardless of the regulatory initiatives. On the other hand, despite all the new regulations, it began to grow in 2013–2016. Such a behaviour of the variable leads to the conclusion that there is a lack of interconnectedness between the regulations and the level of NPLs in the Chinese traditional banking industry. It allows us to verify positively the third assertion that the regulations implemented in China have not eliminated NPLs from the Chinese economy.

The above-mentioned conclusion refers to the period of 2007–2017. It is still unclear, however, what impact will the new regulations (in force since 2016) exert. The lack of suitable data means that it is too early to appraise the process. Taking into account the scope of the new regulatory initiatives, it can be expected, however, that their impact will be much stronger than that of the previous regulations. The excessive debt and its nature (the role of the private corporate sector) poses a real threat for the Chinese economy and the regulations have become stricter and the authorities attach greater attention to their enforcement.

Regarding the implemented regulations, their net impact on the financial stability in China is still unclear. Despite their generally positive influence, they pose some risks as well. The threat to the stability of the banking and shadow banking system might go beyond the possible ineffectiveness of implemented regulations, but also involve the conflicting regulatory interests of the PBoC and the CBRC. Such conflicts might include:

- conflicts of PBoC policy objectives – the increase of interest rates may constrain credit activity and turn out harmful for the whole credit market;
- a sudden change in the regulatory approach towards the shadow banking system and a pressure on NPL elimination may limit the supply of capital on the Chinese market, reduce liquidity and trigger a financial crisis on its own right.

The current development of the Chinese economy has shown that shadow banking itself is not a bad thing. It helps to finance SMEs and other parties that are restricted from normal bank loans. The risk comes from the fact that accepting the development of shadow financing the country is walking a tightrope between maintaining the growth and the need to constrain the risk. It means that the applied regulations must be very precisely tailored to the situation and achieve high effectiveness. The policymakers are aware that any regulatory tightening must be progressive, because rapid tightening is likely to hurt the economy. Policymakers must manage the frequency and intensity of regulations and apply some monetary policy toolkit to deleverage the economy without stymieing its growth. It means that the new regulations are linked to the expansionary monetary policy aimed at averting all severe cash shortages and provide the necessary efficiency (China Daily 2017a).

5 Shadow banking and non-performing loans in the selected sectors of the Chinese industry

Before the global financial crisis of 2008–2009 the Chinese economic growth was fueled by export capacity. Since the crisis when export collapsed, the growth was supported by dramatic increase in Chinese investments, especially in heavy industry and construction. Such sectors as mining,

manufacturing, real estate and construction played the most important role as the stimulus for the whole economy. The investments were mainly debt fueled not only by traditional banks. A huge part of the loans originated from the unregulated part of the financial market. Important roles were played by the linkages between traditional banks and trust companies or other non-bank institutions. There is a variety of mechanisms leading to debt distribution, e.g. banks purchases of investment securities from shadow banking institutions, wholesale funding agreements between banks and shadow banks etc. A significant role is played by loans given to the Chinese industry by the non-bank financial sector. The rapid growth of credit for the Chinese economy is depicted in statistical data, which shows that during the last few years the credit to the non-financial sector in China exceeded 200% of GDP (Figure 2).

It might be assumed that the high growth of credit in the Chinese economy will exert a negative impact on its further development. An important reason for holding such a view is that some part of the credit flow was directed into unprofitable projects and unproductive assets with very small or no return. As a result the excessive credit supply keeps unprofitable companies alive. Attention should be paid to the following processes and dependencies:

- the buildup of credit in some sectors of the economy is parallel to the slowdown of productivity growth and deterioration of asset quality in these sectors;
- the rapid development of some sectors of industry led to the development of asset prices bubbles, e.g. housing prices in some big Chinese cities (Beijing, Shenzhen, Guangzhou etc.);
- the whole Chinese economy is being more and more dependent on credit and the authorities are not undertaking enough efforts to reduce the excessive debt.

All the processes are contributing to the growth of NPLs in traditional banks. Very often the shadow banking sector is the most important cause of the excessive level of NPLs in the traditional banking sector. The level of these loans was very high before the global financial crisis. Later it dropped but since 2012 it has been growing again (Figure 2).

The general problem with NPLs in China involves to a larger extent certain geographic regions and some sectors of the economy (especially manufacturing, mining, construction, wholesale and retail trading). These sectors have been characterized by the highest growth of NPLs during the last five years. In the structure of the Chinese NPLs the biggest share is held by manufacturing (39%) and wholesale & retail trade (36%). Then comes farming, forestry, animal husbandry & fishery (5.8%), construction (4.17%) and real estate (4.15%) (CEIC Database). The data show that the biggest threat to the Chinese economy in 2019 may come from the manufacturing industry. Not only has the sector the highest stake in the NPL structure, but the NPL share in this sector will continue to grow in the future. The increase in their defective lending rate is affected by the slowing macroeconomic growth. Other causes of NPL growth include strong and growing competition between companies and constraints in earnings capabilities, structural imbalances in the Chinese economy, industrial overcapacity in some regions of the country⁴ and population outflows. All these factors lead to the growth of zombie state-owned enterprises and in consequence to the growth of NPLs. The extrapolation (whose methodology is presented in Appendix) prepared on the basis of past data shows that the situation will not improve in the coming months (Figures 4–9).⁵

⁴ An example is the North-East part of China, which is dominated by heavy industry.

⁵ Regarding the extrapolations, it must be highlighted that the calculations are based on historical data and on the assumption that the implemented regulations will not alter the current trends. If there is a significant change of some conditions in the economy (e.g. triggered by the new regulatory initiatives), the presented simulations may lead to erroneous conclusions.

The worst situation in the Chinese industry prevails in the markets of chemical products, steel, cement, shipbuilding, heavy machinery and construction materials. The problem with NPLs in these markets comes from the fact that while demand in these markets has dropped, banks stopped automatically rolling over their loans and in this way impacted on the situation of the producers (PWC 2015). Besides manufacturing and construction, mining is another sector of the Chinese economy endangered by overcapacity and making the debt less profitable. The situation constitutes a danger for the whole economy, because the rapid withdrawal of credit can affect the economy's production capacity to a larger extent.

A much better situation seems to have developed in the wholesale and retail trade industry. Although these branches have the highest number of Chinese commercial bank NPLs, extrapolation shows that there will be a slowdown in NPL growth in the coming months. Real estate is another sector of the Chinese industry which has a large significance for the NPL level in the economy, but it shows symptoms of improvement in the future. The main risks related to the real estate come from the fact that housing bubbles popped up in many cities and they might exert an adverse effect on the situation of the banking sector. The scrutiny of the extrapolation presented in Figure 9 leads to the conclusion that the increase in NPLs in this sector, similarly to the wholesale and retail trade, should slow down during the next year.

The characteristics of NPLs in China should not only be presented on the basis of industrial classification, but also with regard to the division between corporate debt and public debt. The corporate sector in China has faced growing problems since the global financial crisis. Some sectors are characterized by overcapacity, labour intensive enterprises and high indebtedness. Facing the decline in global demand they are the main triggers of risk. Return on investment by some corporates (especially by the state-owned ones) is declining, and very often falls below the cost of capital, which exacerbates the risk (Dieppe et al. 2018). Banks are eager to transfer corporate loans off their balance sheets in order to avoid regulations and to roll over distressed loans. This compounds the risks across the shadow banking sector. Additionally, non-banking financing has widened the sources of credit for firms and led to the growth of new risks.

As it comes to household debt, it must be highlighted that this kind of debt poses no threat to traditional banks or to the whole financial system in China. At present, household debt is relatively small in relation to GDP (60 percentage of GDP in 2017). It is at the level of 20% of overall bank assets in China, so even a 25% NPL ratio for household debt would equal only about 5% of bank assets (Shih 2017). The threat comes from the possibility of an economic downturn, which may lead to debt deflation, triggered by the highly-indebted corporate sector, and in consequence lead to a fall of demand, with further negative consequences.

The presented situation of the Chinese industry and forecasts based on extrapolations confirm that despite the regulatory activities described in point 4, the NPL level in the Chinese industry will continue to rise in the near future. This confirms the third assertion.

6 Concluding remarks

Chinese regulations related to the problem of bad debt implemented during the last few years had two phases. In the first phase (2010–2015) the authorities implemented some measures which helped to

restrain NPL growth in the banking sector, especially in big banks. Small and medium banks were still heavily committed in off-balance sheet operations. During the second phase (since 2016) the authorities have changed their approach and undertaken many regulations, mainly oriented on restricting shadow banking. The plan is to strengthen the regulation of capital markets, to unify the regulatory rules on asset management products, and to limit the regulatory arbitrage in the Chinese financial system. It is expected that in the future the unregulated shadow banking will turn into regulated securities market and the excessive and risky lending will be constrained. It must be highlighted, however, that the idea of canalizing shadow banking into a resilient market based on securities is supported by international institutions, led by the FSB. This scenario might be sufficient in developed financial systems, but it seems to be very difficult to implement in the Chinese market, where the whole infrastructure must be built from scratch.

The Chinese authorities, despite being aware of many threats stemming from the growth of debt and NPLs in banking and the unregulated financial sector, will rather postpone the rapid elimination of NPLs from the economy. They must strive to maintain a balance between the negative aspects of debt and the need to maintain the pace of economic growth. The most probable scenario is that the financial crisis will be easily avoided in the short-term so there will not be a willingness for rapid elimination of bad loans nor a purge of the shadow banking sector. It makes no sense to escalate the deleveraging process, imposing far-reaching regulations addressed to the off-balance sheet lending, micro-lending and internet financing, risking an adverse impact on the whole economy, leading to lower investments level in some sectors and slower growth of the whole economy. The slower growth of the economy might expose less profitable borrowers to a danger or default, a bringing a higher risk of crisis to the whole financial system. It must be highlighted, however, that this kicking-the-can-down-the-road approach will foster the growth of the economy in the short-term but can increase its instability in the long-term.

There is another problem related to the scenario of regulating the NPLs in China quickly. Regulations are usually equal for all Chinese banks but the banking sector is very diversified. Some of the new regulations and banking activity constraints (e.g. broadening the definition of NPLs, loan provision levels, credit tightening and enforced deleveraging) are easily dealt with by the biggest banks but are very harmful for the smaller ones (joint stock banks, city commercial banks and rural banks). The authorities must take into account the existence of this threat, which constitutes a big danger for the whole Chinese banking sector.

The contemporary banking system in China is exposed to one additional threat, caused by the economic policy applied in this country, i.e. the involvement of the economy in the Belt and Road initiative (BRI). The flagship project is financed, among others, by Chinese commercial banks. It can be maintained that these institutions have not had a stellar record in the efficient allocation of their resources in infrastructure projects at home, so they will be unlikely to perform better overseas. These assumptions lead to the conclusion that China is going to export the model that caused the build-up of bad debt for banks at home. They may incur overseas asset quality problems at a time when they are already burdened with NPLs at home. Additionally, the political motivations supporting the BRI project are more important than the commercial logic. It might happen that in the future the project returns will not be sufficient to fully cover repayments to Chinese creditors. Moreover, parallel to the banking sector, shadow banking institutions may also take part in financing BRI. It might create further problems and unduly expanding the unregulated part of the Chinese financial market.

The assertions posed at the beginning of the article were verified as follows:

1 The non-regulated (shadow) banking plays an important role in the Chinese economy – verified positively.

2 The rapid development of the non-regulated part of the financial market in China is fostering the growth of NPLs in the country – verified negatively.

3 The financial regulations implemented in China have not led to the elimination of NPLs from the Chinese economy – verified positively.

Regarding the third assertion, it must be highlighted that there are significant limitations to the presented predictions of NPL levels in the traditional branches of the Chinese industry in the future. The applied extrapolations shows that the loans will continue to rise. It must be, however, strongly emphasized that the research is based on current data and the examined macroeconomic, political and institutional environment. There is a significant possibility that if the conditions change (e.g. if the implemented new regulations exert a greater impact on market participants than the previous ones), the NPL level may radically differ from the one presented in the forecasts.

The research contributes to the literature mainly by emphasizing the importance of the unregulated sector of the Chinese financial market and its interconnectedness with the traditional banking sector and the existing credit risk in the sector. It must be stated that the involvement of the unregulated part of the Chinese financial market in the formal banking sector is very large and often opaque. Due to data limitations and very high complexity of the structures, an analysis of the interconnectedness between the formal and non-regulated financial market in China is very difficult and the research is only a general attempt to deal with the issue.

It must be stressed that Chinese banks are expected to manage their NPLs in the coming year, but the level of bad loans will rise, especially in some small banks operating in the weakest provincial economies. The new regulatory rules for recognizing bad loans in China will cause an additional rise of NPLs in the short term. While they might be able to cope with the challenge in the short term, the still open question is whether the market will be able to contain the threats and to ensure the safe development of the Chinese financial market and economy in the long run.

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Appendix

Methodology and calculations

The methodology presented below was used in section 4 for the extrapolation of NPLs in selected branches of the Chinese industry. The data source (CEIC) contains quarterly amounts of bank NPLs for the whole Chinese industry (q_{iy} , where i denotes a quarter and y a year) and annual amounts of bank NPLs for the main branches of industry (n_{ys} , e.g.: manufacturing industry, construction industry, mining industry, wholesale and retail trade industry, real estate industry) in 2010–2016. The extrapolations were calculated in accordance with the methodology provided by Rao and Toutenburg (2008) and made on a quarterly basis. It was assumed that the proportion (p_{ys}) of the share of any branch did not change during any single year. By this assumption the quarterly amount of banks' NPLs for different branches were extrapolated as a part of the quarterly amount of banks' NPLs for the whole Chinese industry. Thus, first we calculate the proportion:

$$p_{ys} = \frac{n_{ys}}{q_{4y}} \quad (1)$$

where:

n_{ys} denotes the annual amount of bank NPLs for sector s in year y ,

q_{iy} denotes the amount of bank NPLs for the whole section in year y for quarter i , e.g. $i = 4$, gives the amount of bank NPLs at the close of the fourth quarter, i.e. the annual amount.

The final extrapolated set of data comes from the formula:

$$d_{iys} = p_{ys} \cdot q_{iy} \quad (2)$$

Due to the procedure there are 40 quarterly values of banks NPL for each branch (d_{iys}) in 2008–2017. It makes it possible to use the least squares method (for more details see e.g. Rao, Toutenburg 2008) to fit the current linear trend for segments. In other words, we have:

$$d_{iys} = a_0 + a_1 X_1 + a_2 X_2 \quad (3)$$

where:

$X_1 = (2012 - \text{year} - \text{quarter})$ before 2012 and 0 after 2012,

$X_2 = 0$ before 2012 and $(\text{year} + \text{quarter} - 2012)$ after 2012.

There is no one clear moment where the trend changed. Following its analysis we assumed 2012. The future values of NPLs depend on many hidden variables and we only had historical data, therefore we decided to take only the general trend into account.

The values of the extrapolated datas was presented in Figures 4–7 and in Table 3.

Table 1

The banking sector in China – number of institutions and their share in total banking assets

Bank group	Percent of assets (the end of 2015)	Number of banks
Commercial banks	70.5	190
Large commercial banks	39.2	5
Joint-stock commercial banks	18.6	12
City commercial banks	11.4	133
Foreign banks (locally incorporated foreign banking institutions)	1.3	40
Policy banks and China Development Bank	9.7	3
Small- and medium-sized rural financial institutions	16.5	3 677
Rural cooperative financial institutions:	12.3	2 303
– rural credit cooperatives	4.3	1 373
– rural commercial banks	7.6	859
– rural cooperatives banks	0.4	71
Postal savings banks and new-type rural financial institutions:	4.2	1 374
– village or township banks	n.d.	1 311
– lending companies	n.d.	14
– rural mutual cooperatives	n.d.	48
– postal saving bank	n.d.	1
Non-bank financial institutions	3.3	115
Trust companies	n.d.	68
Financial leasing companies	n.d.	47
Total	100	3 985

Source: CBRC (2015); Ping (2015, p. 7).

Table 2

Connections between the shadow banking and formal banking sector in China

Segment of shadow banking	Bank off-balance sheet financing	Credit enhancement layer	Non-bank lending layer
Description	Banks help to satisfy credit demand via off-balance sheet “channeling” as they are constrained by regulatory requirements	Some institutions help to increase lending by providing guarantees to banks for customers with lower creditworthiness (indirect participation) or by participation in lending (direct participation)	Non-banks meet credit demands not met by banks (directly or indirectly)
Connection to banks	High	Medium	Low
The category of risk and its impact on formal banks	The risks stem from mismatch between investor risk appetite and asset risk	The risk could spill over to banks	The risk is high but usually it would not spill over to the banking sector*. It poses little systemic risk
Instruments	Off-balance sheet WMPs, bankers’ acceptances	Guarantees	Entrusted loans, trust product/loans, LGFVs, financial leasing, underground high-yield lending
Institutions	Banks	Banks	Leasing companies, pawnshops, microfinance companies

* This view is presented in a different way in the literature. Sometimes it is highlighted that trust companies can easily put banks in a vulnerable position.

Source: Sheng et al. (2015); Sheng, Soon (2016, p. 164).

Table 3

The data used for the creation of Figures 3–7

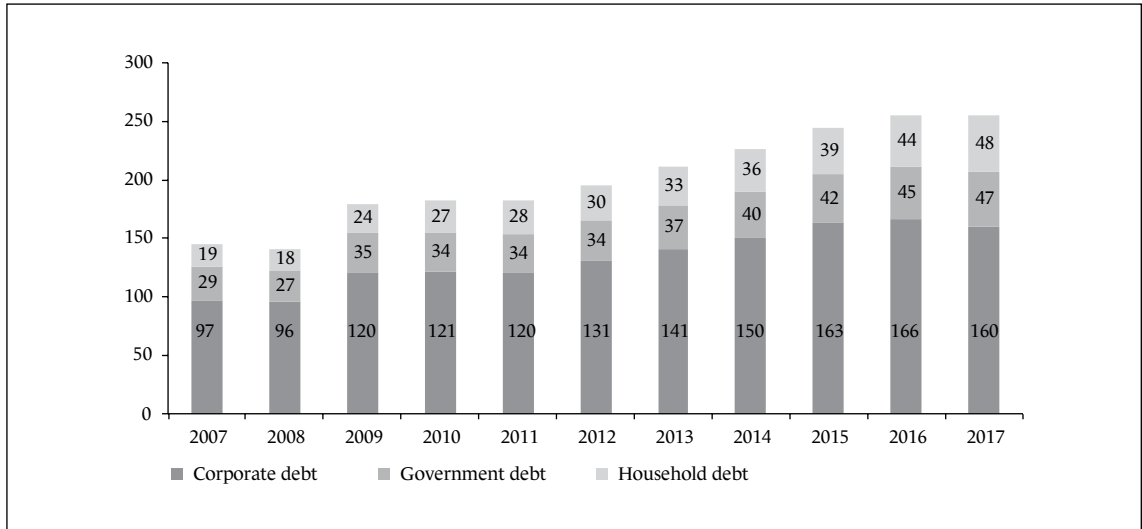
Year	Quarter	NPLs for mining industry	NPLs for manufacturing industry	NPLs for construction industry	NPLs for wholesale and retail trade industry	NPLs for real estate industry
2005	I	20.52	634.35	33.91	360.45	151.43
	II	14.33	442.91	23.68	251.67	105.73
	III	14.38	444.61	23.77	252.63	106.13
	IV	14.75	455.9	24.37	259.05	108.83
2006	I	14.12	467.21	23.61	248.87	99.64
	II	13.8	456.62	23.07	243.23	97.38
	III	13.7	453.38	22.91	241.51	96.69
	IV	13.5	446.72	22.57	237.96	95.27
2007	I	13.43	450.62	22.18	225.85	88.88
	II	13.66	458.07	22.55	229.58	90.35
	III	13.66	458.07	22.55	229.58	90.35
	IV	13.68	458.89	22.59	229.99	90.51
2008	I	7.87	413.44	28.7	156.06	150.35
	II	7.85	412.4	28.63	155.67	149.97
	III	8	420	29.16	158.54	152.73
	IV	3.54	185.95	12.91	70.19	67.62
2009	I	2.96	189.69	12.97	71.18	55.70
	II	2.79	178.85	12.23	67.11	52.52
	III	2.72	174.15	11.91	65.35	51.14
	IV	2.68	171.67	11.74	64.42	50.41
2010	I	2.48	157.53	10.81	59.48	47.68
	II	2.40	152.43	10.46	57.56	46.14
	III	2.30	145.90	10.01	55.09	44.16
	IV	2.29	145.29	9.97	54.86	43.98
2011	I	3.15	147.22	11.08	57.12	35.77
	II	3.07	143.69	10.81	55.75	34.91
	III	2.96	138.56	10.43	53.76	33.66
	IV	3.11	145.39	10.94	56.41	35.32
2012	I	2.76	157.42	10.70	95.25	24.81
	II	2.88	163.96	11.15	99.21	25.84
	III	3.02	172.00	11.70	104.08	27.11
	IV	3.11	177.07	12.04	107.14	27.91

Table 3, cont'd.

Year	Quarter	NPLs for mining industry	NPLs for manufacturing industry	NPLs for construction industry	NPLs for wholesale and retail trade industry	NPLs for real estate industry
2013	I	4.34	191.16	11.44	151.20	19.06
	II	4.45	195.88	11.72	154.93	19.54
	III	4.65	204.63	12.24	161.86	20.41
	IV	4.88	214.98	12.86	170.04	21.44
2014	I	13.92	232.77	16.43	206.65	20.19
	II	14.97	250.17	17.66	222.10	21.70
	III	16.53	276.29	19.50	245.29	23.96
	IV	18.16	303.56	21.43	269.50	26.33
2015	I	33.81	331.37	35.35	308.20	35.15
	II	37.58	368.27	39.28	342.52	39.06
	III	40.83	400.11	42.68	372.13	42.44
	IV	43.86	429.82	45.85	399.77	45.59
2016	I	62.28	461.96	52.99	416.43	53.11
	II	64.30	476.96	54.71	429.95	54.83
	III	66.83	495.74	56.86	446.89	56.99
	IV	67.65	501.81	57.56	452.36	57.69
2017	I	62.70	507.31	64.78	437.65	65.46
	II	64.94	525.39	67.09	453.25	67.79
	III	66.31	536.50	68.51	462.84	69.23
	IV	67.71	547.84	69.96	472.62	70.69
2018	I	79.57	598.91	74.37	545.52	78.11
	II	83.42	620.39	77.64	566.55	81.78
	III	87.28	641.87	80.90	587.57	85.45
	IV	91.14	663.35	84.17	608.60	89.12
2019	I	95.00	684.84	87.43	629.63	92.79

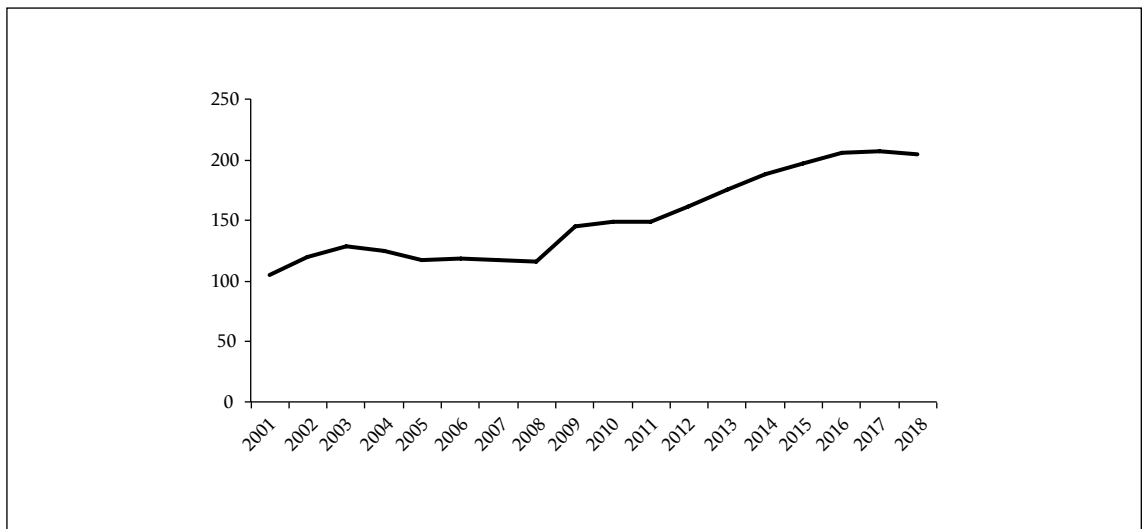
Source: CEIC data; for 2018 and 2019 own calculations. The data in bold represent a forecast.

Figure 1
Debt to percentage of GDP in China in 2007–2017



Source: China Power (2018).

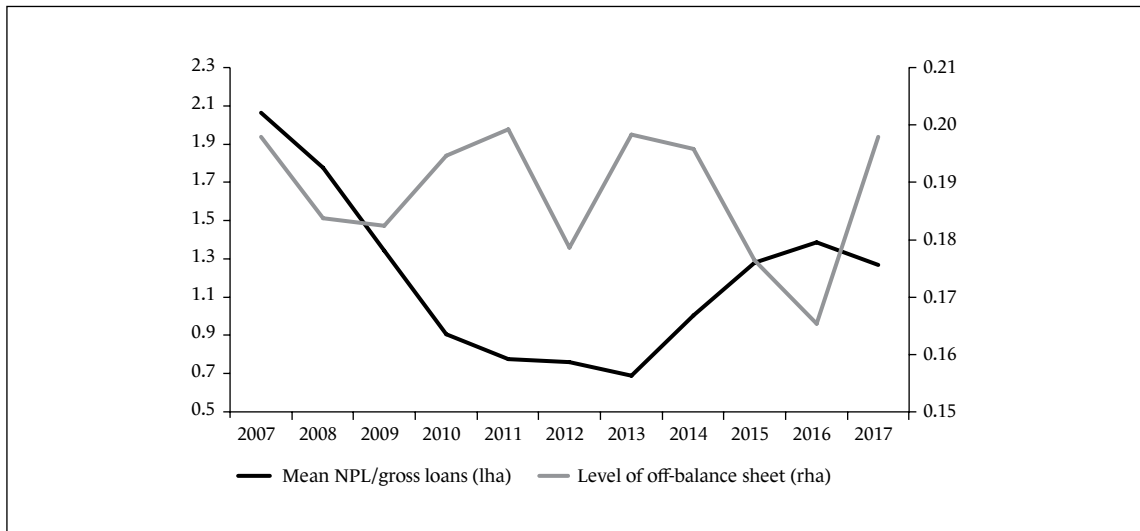
Figure 2
The credit to the private non-financial sector (as percentage of GDP) in 2001–2018



Source: BIS statistics.

Figure 3

The level of NPL / gross loans and off-balance sheet assets / total assets for the selected banks operating in China in 2007–2017



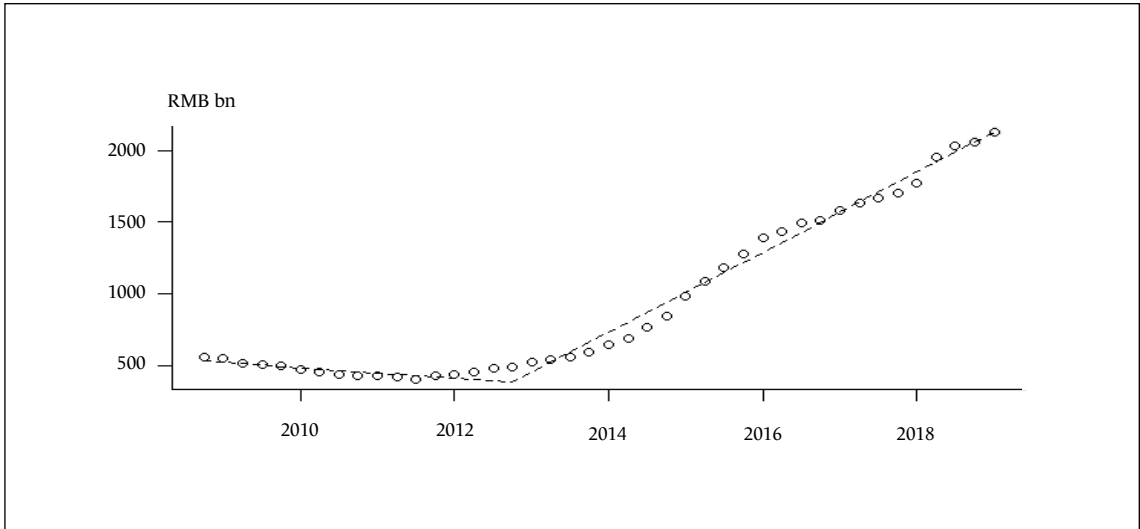
Notes:

The calculations are based on the operations of the following banks operating in China: Agricultural Bank of China, Industrial and Commercial Bank of China, China Development Bank, Bank of China, Bank of Communications, China CITIC Bank Corporation, China Merchants Bank, China Construction Bank, Shanghai Pudong Development Bank, China Minsheng Banking Corporation, PingAn Bank, Hua Xia Bank, China Zheshang Bank, China Guangfa Bank, China Bohai Bank, Hengfeng Bank, Industrial Bank, Postal Savings Bank of China, Bank of Beijing, Bank of Shanghai, HSBC Bank China, The Bank of East Asia China, Standard Chartered Bank China, Hang Seng Bank China, Citibank China.

Source: the author's own calculations based on Bank Focus database.

Figure 4

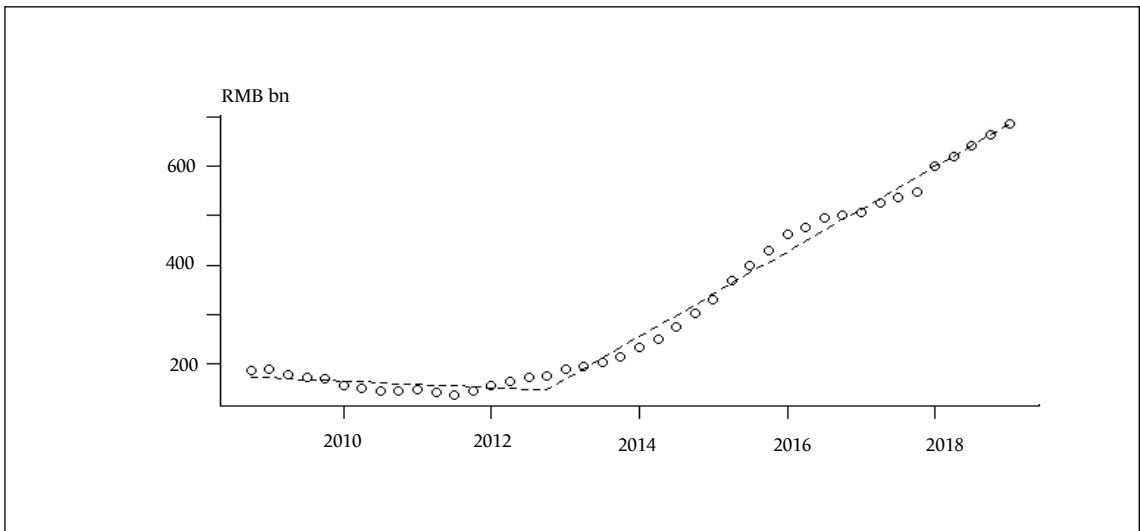
Amount of bank NPL in the period of 2009–2017 and extrapolation for 2018–2019 Q1



Source: CEIC database.

Figure 5

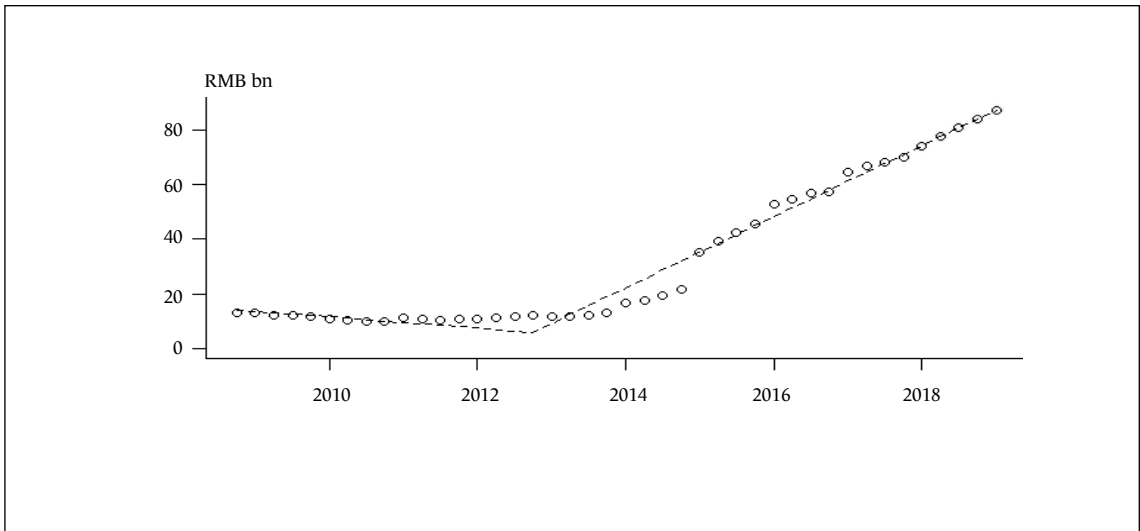
The value of commercial banks' NPLs in the manufacturing industry in 2009–2017 and extrapolation for 2018–2019 Q1



Source: CEIC data.

Figure 6

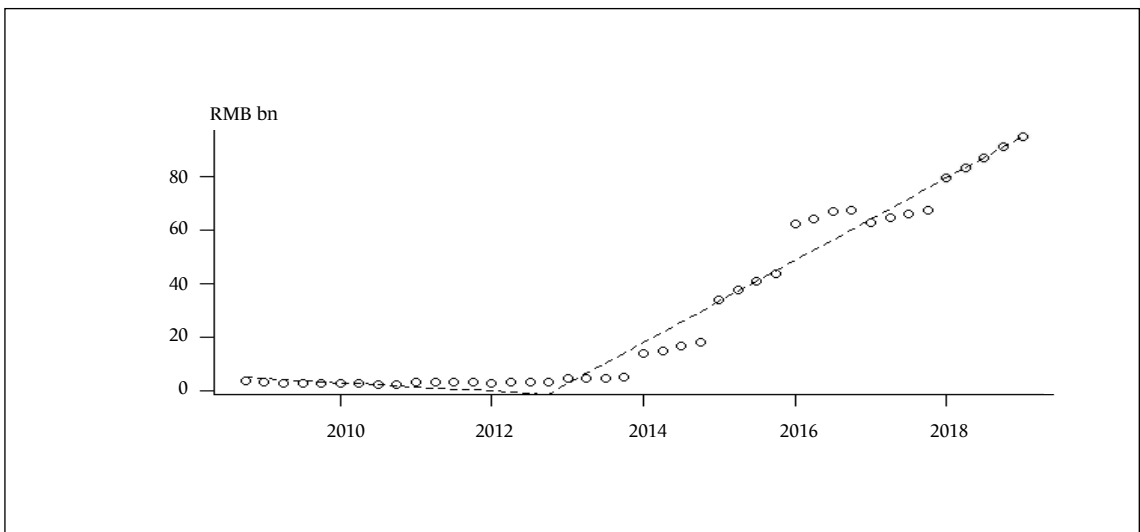
The value of commercial banks' NPLs in the construction industry in 2009–2017 and extrapolation for 2018–2019 Q1



Source: CEIC data.

Figure 7

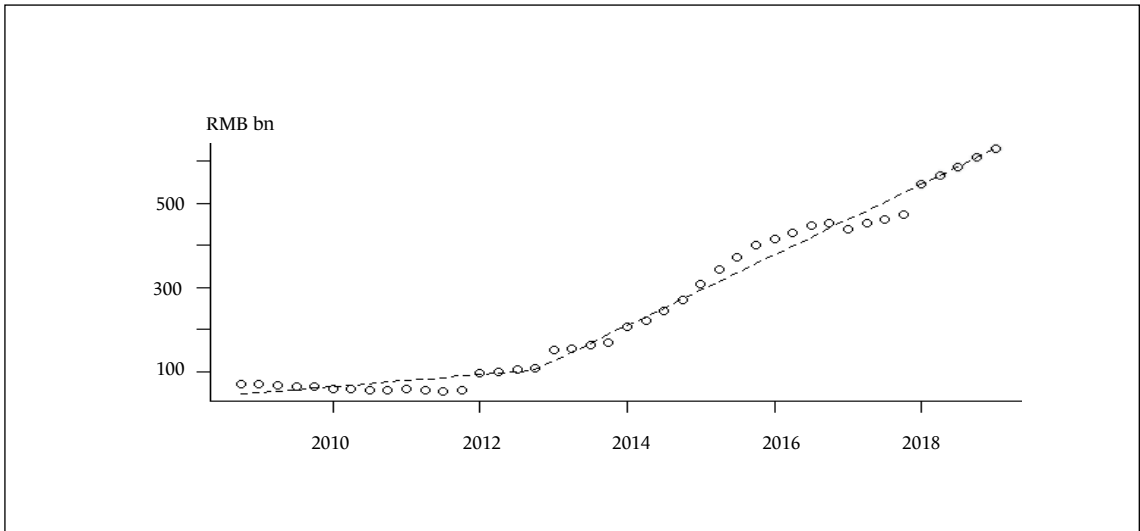
The value of commercial banks' NPLs in the mining industry in 2009–2017 and extrapolation for 2018–2019 Q1



Source: CEIC data.

Figure 8

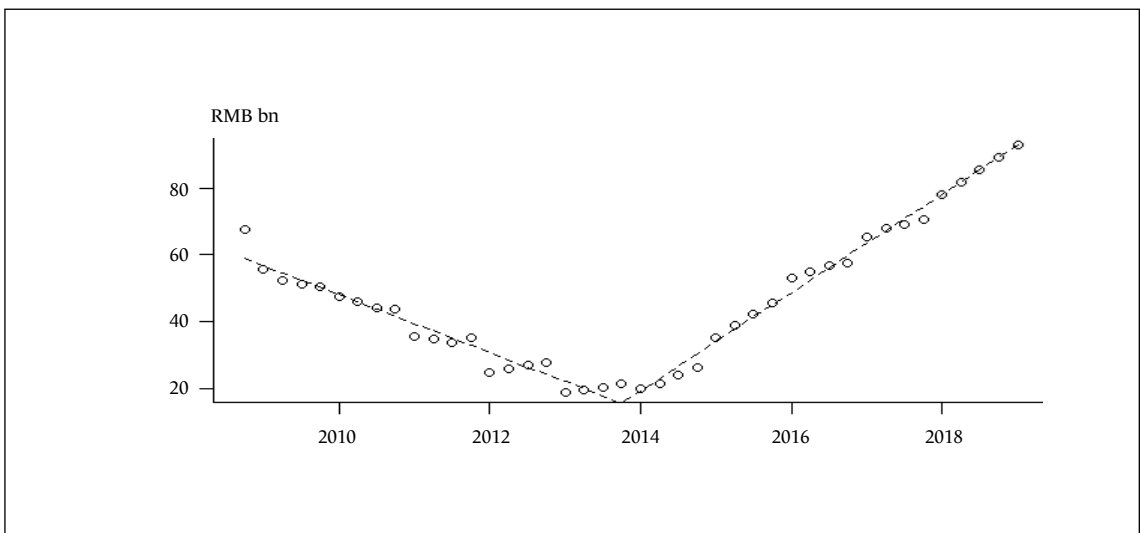
The value of commercial banks' NPLs in the wholesale and retail trade industry in 2009–2017 and extrapolation for 2018–2019 Q1



Source: CEIC data.

Figure 9

The value of commercial banks' NPLs in the real estate industry in 2009–2017 and extrapolation for 2018–2019 Q1



Source: CEIC data.

