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Credit as a Crux in China's Economic Growth

Credit Expansion and its Influences on China's Real Economy

Master Thesis for the degree of Master of Science
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I hope that you will enjoy reading the current research. If you have any questions or comments, please do not hesitate to contact me.

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May 2, 2019

Abstract

The research aims to give an overview of the role credit has played in China's economic growth and explore the transmission mechanisms behind. The idea is to study China's credit expansion and distribution in the non-financial sector, and then link it to the economic growth from both supply and demand sides. The methods used here is qualitative research on market facts and literature. The results show that credit has significantly stimulated China's economic growth after 2002, while at the same time raised various problems like increasing shadow banking activities, real-estate bubbles, overcapacity, and zombie firms. These problems will threaten financial stability and damage the long-run economic development, implying an unstainable economic growth in the future.

Keywords: China, credit boom, investment-driven growth, credit misallocation, shadow banking system, stimulus plan, real estate market, financial stability

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List of Abbreviations

BIS: Bank for International Settlements

CASS: China Academy of Social Science

CBRC: China Banking Regulatory Commission

IMF: International Monetary Fund

MOF: Ministry of Finance

NBS: National Bureau of Statistics of China

NAO: National Audit Office

PBC: People's Banks of China

SAFE: State Administration of Foreign Exchange

SASA: State-owned Assets Supervision and Administrate

1 Introduction

1.1 The importance of the issue

China experienced a prolonged boom after the 'reform and opening up' (open-up reform) in 1978[1], mainly followed by an investment-driven growth path. Many studies confirm that investment has played a crucial role in driving China's growth over the last decades (e.g. Jun, 2003; Qin et al., 2006; Tang et al., 2008; Zhu & Kotz, 2011; Pencea & Oehler-sincai, 2015), but few explore the influencing factors and mechanisms behind (see discussion in Section 2). This master thesis will hence dig one step deeper into them.

Based on the financial deepening theory from Schumpeter (1934) and the subsequent developments from Werner (2010) and Herr (2010), credit is the crux in this investment-driven growth through a credit-investment-income process. They argue that credit can be created "out of nothing" and act as "circuit starters" for investment and production; whether credit can promote economic growth depends on what purpose it used for, and its efficiency is linked to the lending and borrowing behaviors during the process. This calls for further analysis of the credit supply and demand in China. More specifically, it raises questions of **1. how credit created and distributed in China, 2. what purposes it used for**, and **3. what influences it made to economic development and financial stability.**

Furthermore, China's investment-led growth has slowed with cooled wage growth, contracted manufacturing activities, and reduce import after the GFC in 2008 (Balding, 2019). At the same time, it also confronted with problems like over-indebtedness, structural imbalances, and asset bubbles, which closely linked to fast credit expansion (Zhang, 2016). Therefore, a closer look at the relationship between credit expansion and economic development can help

[1] The Chinese 'reform and opening up' refers to the program of economic reforms termed "socialist market economy" in China. It was led by Deng Xiaoping and started in December 1978. These tenets aimed at expanding rural income and incentives, encouraging experiments in enterprise autonomy, reducing central planning, and establishing direct foreign investment in Mainland China. Source: Brandt, Loren; et al. (2008), "China's Great Transformation", in Brandt, Loren; Rawski, G. Thomas (eds.), *China's Great Transformation*, Cambridge: Cambridge university press http://groups.chass.utoronto.ca/brandt/wp-content/uploads/Chinas-Great-Transformation-Excerpt.pdf

to explore **4. why investment-driven growth is no longer sustainable**, and **5. how to address debt problems in China.**

1.2 Aim of the work

The work aims to give an overview of the role credit has played in China's economic growth. Accordingly, five questions are raised to solve (see above), and a further breakdown of credit is needed. Unlike other research papers focusing on the quantitative discussion, this research will answer questions based on literature reviews and market facts. Widely-used Chinese macroeconomic datasets and their sources will also be reviewed to facilitate follow-up research.

Firstly, the work will theoretically explain why credit act as the crux in China's investment-driven growth. Then, the research goes into two directions: the credit supply and credit demand in China. From the supply side, the research aims to analyze how credit is created and supplied from the financial system and generally what influences it can make to economic development. From the demand side, the credit in the real economy will be decomposed into three sectors: government, non-financial corporations, and households. The following analyses will focus on how debt expands and distributes in these different sectors, and how it can influence economic development through these different channels. Lastly, the work aims to find the reason for the weakening investment-driven growth and the way to address associated economic problems.

1.3 Structure of the research

A brief introduction to China's economic development history and an explanation of the credit's pivotal role in China's investment-driven growth will be given in Section 2. Then, Section 3 will analyze the credit supply in China, with emphasis on the differences between banking and the shadow banking system. Section 4 will explain the evolution of government

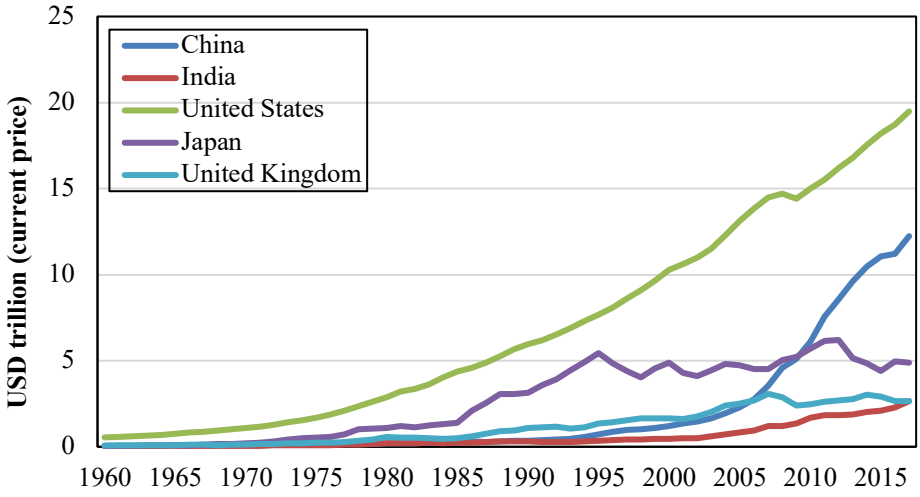
debt and highlight its linkage to China's real-estate market boom and the increasing shadow banking activities. Section 5 will bring both macro and micro perspectives to discuss the corporate debt expansion and credit misallocation, with further analysis on associated issues like overcapacity and zombie firms. Section 6 will study the driving forces behind household debt accumulation, as well as its influences on the consumption-driven economy. In the end, conclusions and implications will be given in section 7.

2 China's investment-driven growth

2.1 China's economic development history

China has experienced a prolonged boom since the 1978 open-up reform, after which it started to transit from a planned to a market-oriented economy and maintained a high GDP growth rate around 8% (see **Figure 2.2**). By 2018, China's GDP reached 90 trillion RMB (13.3 trillion USD), making it the second largest economy next to the US in the world (see **Figure 2.1**). China is also the first manufacturer, the second largest global investment destination, and the top exporter internationally (Pencea & Oehler-sincai, 2015). Apart from these outstanding economic performances, China also successfully managed to reduce poverty and maintained inflation and exchange rate stability (Herr, 2010; Chen & Kang, 2018). However, problems like structural imbalance and regional inequality still exist in China. China's heavy reliance on investments also signals an unsustainable growth (Pencea & Oehler-sincai, 2015; Zhang, 2016). Since the Global Financial Crisis (GFC) in 2008, China's growth rate has slowed and reached a historically low level, which implies increasing uncertainties in the economy and growing needs to find new driving forces.

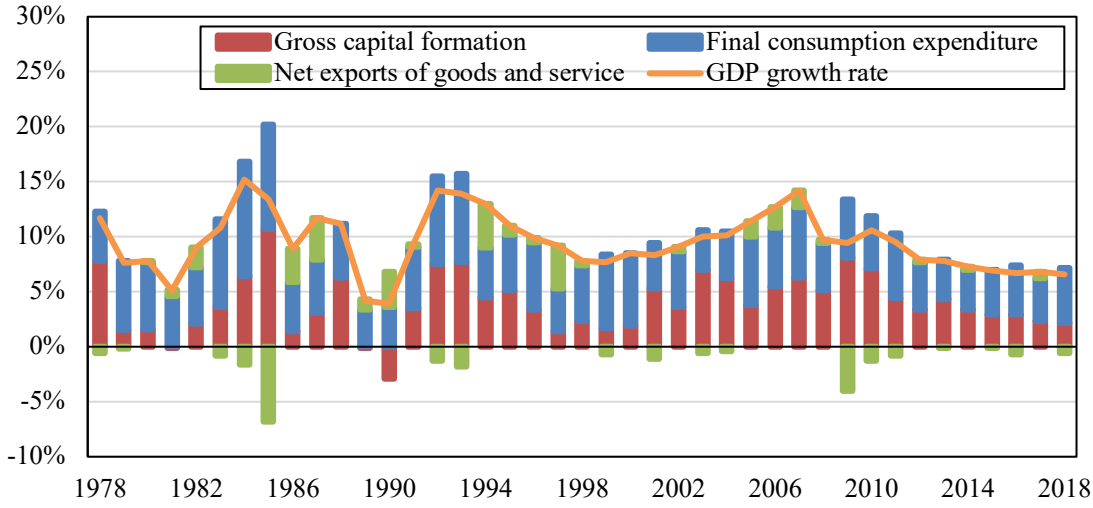
Figure 2.1: Country GDP: World, 1960-2017



Source: The World Bank (see Appendix 2)[2]. Note: The GDP is measured by current price. China experienced exponential growth after 1978 and became the second largest economy in the world.

[2] The data used in figures and tables is listed in the **Appendix 2: Data sources**, in which the source URL, a brief description, and the time range are provided.

Figure 2.2: The contribution of GDP components to GDP growth: China, 1978-2018



*Source: National Bureau of Statistics (NBS) http://data.stats.gov.cn/english/easyquery.htm?cn=C01. Note: Contribution = GDP growth rate * contribution share. Contribution share = increment of component GDP/increase of GDP. By expenditure approach, investment (gross capital formation), consumption (final consumption expenditure), and net exports (net exports of goods and service) are three components of GDP. There were roughly four cycles over the last 40 years, during which increments of investment, consumption, and net exports contributed differently to the GDP growth.*

Figure 2.2 implies four cycles over the past 40 years. Based on studies from Zhu & Kotz (2011) and Pencea & Oehler-sincai (2015) on China's evolutionary stages, three turning points can be identified: the year 1992 when Deng Xiaoping had his Southern tour[3], the year 2001 when China entered the WTO, and the year 2008 when the Global Financial Crisis (GFC) happened. This divide the long period of boom into four stages: 1978-1991, 1992-2000, 2001-2007, and 2008-2018.

Table 2.1: The growth pattern: China, 1978-2018

Indicator	1978-1991	1992-2000	2001-2007	2008-2018
GDP growth (average, %)	9.3%	10.6%	10.8%	8.1%
Contribution Share to GDP growth (average, %)				
Investment	24.5%	34.7%	50.8%	49.9%
Consumption	66.2%	58.8%	46.3%	56.2%
Net export	9.3%	6.5%	2.9%	-6.1%

[3] On his tour, Deng made various speeches and generated large local support for his reformist platform. He stressed the importance of economic reforms and set in motion a dual-track transition to a market-oriented economy (Zhao, 1993).

Composition in GDP (end of the period, %)				
Investment	36%	34%	41%	44%
Consumption	62%	63%	50%	54%
Net export	3%	2%	9%	2%

Source: NBS. Note: Contribution share = increment of component GDP/increase of GDP by expenditure approach. Four stages have been identified; investment has been increasingly contributing to the GDP and GDP growth, while consumption's contribution first decreased and then recovered a bit.

From 1978 to 1991, China's remarkable growth was domestic **market-led** and could be explained by the open-up reform and associated economic and financial adjustments. During this period, household consumption increased rapidly due to the reforms in the agriculture sector. The policies aimed to increases household income through lifting purchasing price for agriculture (Zhu & Kotz, 2011). This enabled household consumption to play a leading role in the GDP growth, with its contribution share to GDP growth averagely standing at 66% and composition in GDP reaching 62% in 1991 (see **Table 2.1**).

Furthermore, the financial system reform in 1984[4] caused a sharp rise in the money supply (M2) and led to the investment boom. It can be seen from **Figure 2.2** that the growth rate peaked twice during this stage and each associated with an investment surge, which implies that investment also promoted the economic growth apart from the consumption. Yu (2003) confirms this investment-driven expansion path and finds that fixed-capital investment unidirectional caused the growth in industrial output during 1980-90s. In 1989, "Tiananmen Square Event"[5] disrupted this boom, followed by the cut-down of investments and a temporary pullback from further economic reforms. As a result, the GDP growth slowed significantly to a rate (3.9%) that far below the historical average (10.2%).

In 1992, Deng Xiaoping stressed the importance of the open-up reform in his 1992 southern tour and set in motion a dual-track transition to a market-oriented economy, which started a new stage of **investment-led growth** during the period of **1992 - 2000**. Deng's speeches and

[4] During this period there were important changes in China's financial system. The banking system was separated from the fiscal system, and the People's Bank of China became the central bank, with its commercial banking functions and branches transferred to newly established state- owned commercial banks. In 1984 the government announced that the loan quota of these commercial banks would be based on the loans the banks made in the previous year, and this policy would be implemented in 1985. This caused a 49.4 percent increase in the money supply (M0) in 1984. (Zhu & Kotz, 2011, p. 14-17)

[5] It is a student-led demonstrations in Beijing in mid-1989. See https://china.usc.edu/assignment-china-tiananmen-square

associated reforms led to a surge in investment (see **Figure 2.2**). Between 1992 and 1993, the contribution of investment to GDP growth nearly doubled, and the GDP growth reached a historically high level of 14%. However, this gave rise to rapid inflation in the following years with the consumer price inflation rate surged to 24% in 1994, resulting in a series of cooling-down policies in 1993 by cutting public investment, tightening the money supply, and increasing interest rates (Zhu & Kotz, 2011). Throughout the stage, investment grew 3 percentage points faster than GDP with its contribution share to GDP growth increased by 10 percent, while consumption and net exports grew at a similar rate with GDP with decreasing contribution (Zhu & Kotz, 2011). This indicates that investment became increasingly important in driving China's economic development.

In 2001, China joined the WTO and strengthened its integration into the world system, which speeded up China's industrialization process and intensified China's reliance on capacity investments (Zhu & Kotz, 2011). At the same time, the housing reforms[6] and large-scale government infrastructure investment programs[7] that started from 1998 further contributed to the investment expansion in the real economy, through providing large amounts of investment opportunities in the real-estate market and infrastructure sector. Accordingly, investment became the main contributing factor to economic growth, with its average contribution share to GDP growth increased sharply to 50.8% while that of consumption decreased to 46.3% (see **Figure 2.2**). At the same time, the export and manufacturer sector grew rapidly, as the export share of GDP rose from 22.7 % to a remarkable 38.6 % of GDP and its contribution share reached 57.4% of GDP growth over the period[8] (Zhu & Kotz, 2011). Many studies suggest that China experienced both **export- and investment-led growth** from **2001 to 2007** (Herr, 2010; Zhu & Kotz, 2011; Pencea & Oehler-sincai, 2015).

After the GFC in 2008, China entered into a new stage of **"Great Rebalancing"** and started to transform from an investment-driven to a consumption-driven economy (Nicholas, 2007). The stimulus plan in 2009 injected a great deal of liquidity into the real economy and

[6] The 1988 urban housing reforms fostered the privatization of housing, which ended enterprise-supplied housing and moved to comprehensive market-based housing provision. This directly led to a real estate bubble in 2002, which promoted the investments in real estate assets.
[7] A huge government infrastructure investment programs were implemented in 1998, which entailed building ports, airports, subways, and a new highway system, continued to raise the investment share after 2001 (Zhu & Kotz, 2011).
[8] The net exports contribute share was decreased to 2.9% because the same sharp increase in import.

successfully helped China to counter the global economic crisis and associated negative influence on exports. **Figure 2.2** shows that the stimulus plan led to an immediate acceleration of China's GDP growth to 10.6% in 2010, which was mainly driven by the sharp increase in investment contribution. The investment boom incurred by this stimulus plan boosted economic development in the short run, while at the same time raised long-run issues of rising indebtedness, overcapacity, and asset bubbles (Lee et al., 2012; Pencea & Oehler-sincai, 2015). It can be seen from **Figure 2.2** that the growth rate slowed since 2010 to a level below the historical average, despite investment's increasing share in GDP and contribution to GDP growth. This signals that investment-driven growth is no longer sustainable in China.

Many studies (Lardy, 2007; Nicholas, 2007; Zhu & Kotz, 2011; Pencea & Oehler-sincai, 2015; Zhang, 2016; Chen & Kang, 2018) have studied the rebalancing in China, and most suggested a shift towards the consumption-driven economy and a focus on domestic demand. The Chinese government also claimed that China had entered a stage of "new normal" in which it experienced slowed GDP growth rate, cooled wage growth, and contracted manufacturing activities, and confronted with problems like overinvestment, structural imbalance and asset bubbles (Zhang, 2016; Balding, 2019). Accordingly, the Chinese government started a series of supply-side structural reforms[9], looking for ways to address these problems and new engines to drive economic growth.

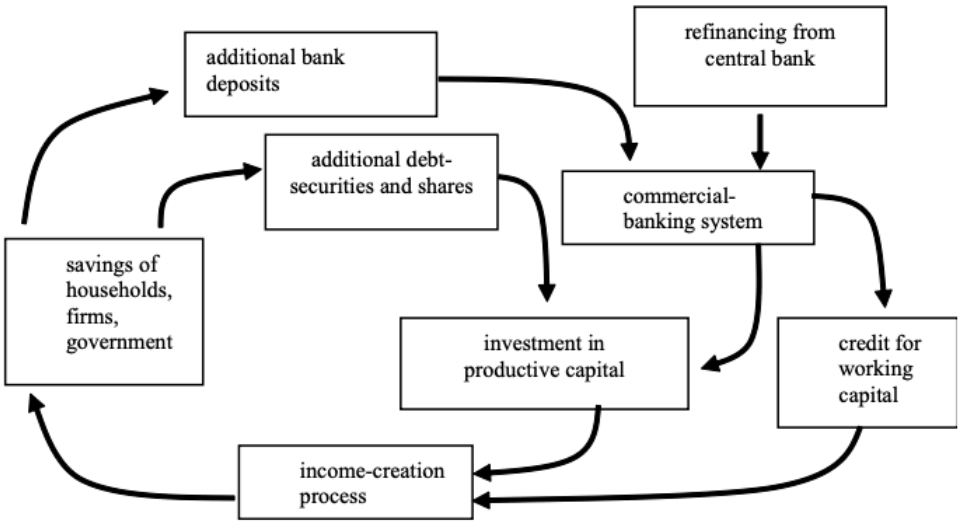
2.2 Credit as a crux in the investment-driven growth model

As discussed in the last section, investment plays a critical role in driving China's economic growth, though its promoting effects are weakening, and many problems are rising. This investment-led growth can be explained by the Schumpeterian-Keynesian credit-investment-income-creation process (see **Figure 2.3**), for which Herr (2005, 2008a, 2008b, 2010) gives a detailed explanation with an emphasis on credit's role in this process. This model is derived from the financial deepening theory from Schumpeter (1934), which highlights the role of

[9] Supply-side reform was first mapped out in December 2015, by Xi Jinping, to guide the new normal. It identified five areas to focus: 1.Cutting (industrial) overcapacity 2.Destocking (property inventory) 3.(Corporate) deleveraging 4.Lowering corporate costs 5.Improving "weak links". The Economist Intelligence Unit (2017) China's Supply Side Structural Reforms: Progress and Outlook. https://www.andrewleunginternationalconsultants.com/files/chinas-supply-side-structural-reform.pdf.

credit in transferring saving to investment; and the subsequent developments from Keynes (1937) and Werner (2005, 2009, 2010), which focus on the monetary intervention and credit creation process separately.

Figure 2.3: The credit-investment-income process



Source: Priewe & Herr, (2005); Herr (2010)

Commercial banks can create credit "out of nothing." They can give credit by transferring deposits into loans or simply lengthening their balance sheet (Werner, 2005, 2009, 2010; Stoop, 2010; Herr, 2010)[10]. The newly created credit can create new purchasing power, which then used for consumption, production and investment in the real economy sheet (Allais, 1987; Werner, 2009; Stoop, 2010). Based on Stoop's review on Werner's studies, if new purchasing power is used for the real purpose (e.g., investment in productive capital), nominal GDP will grow; while the use of new purchasing power for speculative transactions can lead to asset price inflation.[11] Furthermore, the central bank can facilitate the process by refinancing commercial banks and implementing monetary policies (Keynes, 1937).

[10] Werner takes different views on credit creation process from traditional Schumpeterian studies. In traditional context, it is defined as the process by which saving is channeled to alternative uses and hence banks are mere financial intermediaries. In the current context, credit can be created out of thin air. The concept of lending implies that the item (in this case the money) is physically removed from the lender's balance sheet and transferred to the borrower's (Stoop, 2010).

[11] Werner distinguishes credit created for real purposes and for speculative transactions. Credit for real purposes includes loans to the real economy like small and medium manufacturing companies (productive), and credit for the purchase of consumer goods such as cars or electronic equipment (non-productive). Speculative transactions encompass credit for real estate speculation (mortgages, real estate investment funds), loans to SIVs (Special Investment Vehicles), hedge funds, margin loans or loans to non-bank financial institutions (Stoop, 2010). See Appendix 3.

Credit can act as "circuit starters" for production and investment (Schumpeter, 1934; Bossone & Sarr, 2002; Herr, 2010). Accordingly, incomes are made in the form of wages and profits from these economic activities, and in the end, become savings and deposits in the banking system for further credit supply. The fundamental in this credit-investment-income process is that it allows borrowers to invest and consume first and repay debts with earned profits and incomes in the future. This feedback loop is viewed as a money multiplier process by many studies (Stoop, 2010; Pintus & Wen, 2013; Xiong et al., 2017). They point out that the money multiplier is not only determined by the reserve requirements, but also the repayment habits in consideration of their pay-back time delay. Therefore, further analysis of China's credit supply and demand is necessary to evaluate the efficiency of this credit-investment-income process[12].

2.3 An overview of credit and economic development in China

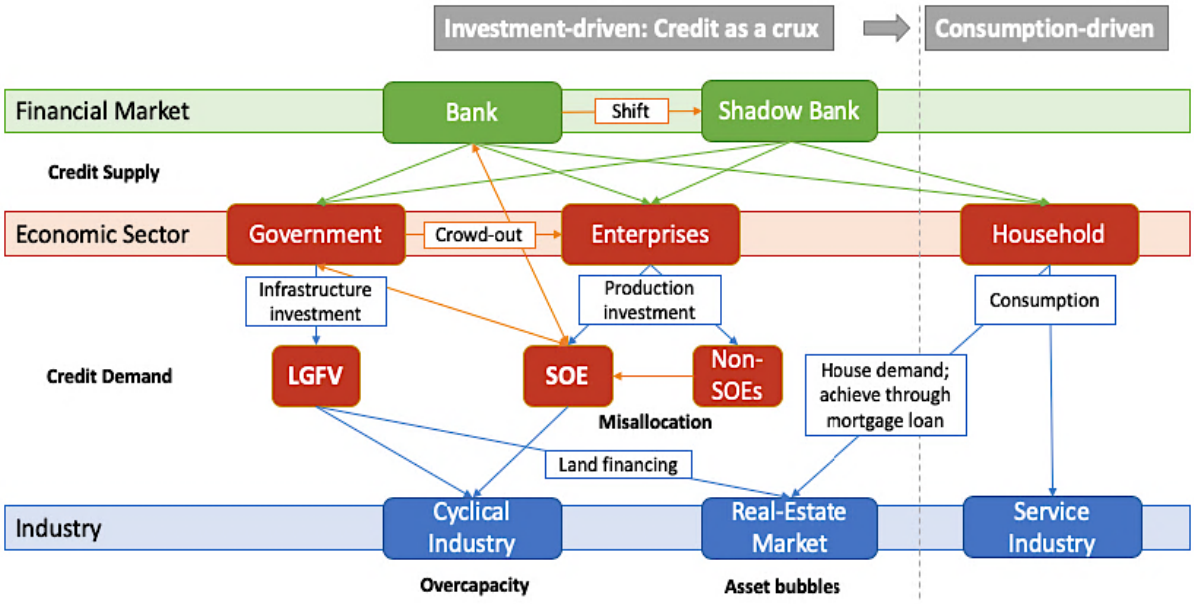
China's development follows the credit-investment-income process with credit acting as the crux in its investment-driven growth. As discussed above, this process is influenced by the lending and borrowing behaviors, which makes a discussion on China's credit supply and demand situations necessary. The following sections will analyze 1. how credit expanded and distributed, 2. what influences it made to the economic development, from both supply and demand perspectives. Here the work is to give an overview of the logical structure that used for the subsequent studies (see **Figure 2.4**).

From the supply side, banks and shadow banks both act as credit suppliers, with the shadow banking system[13] playing an increasingly important role in injecting liquidity into the real economy (**Section 3**). From the demand side, different economic sectors raise debt for different purposes. Local governments raise debt to finance infrastructure investment through

[12] The efficiency means how much can credit promote income (GDP) growth and how fast can generated income payback raised debt.
[13] The shadow banking system is a term for the collection of non-bank financial intermediaries that provide services like traditional commercial banks but outside normal banking regulations. This definition was first put forward by Paul McCulley, see http://media.pimco-global.com/pdfs/pdf/GCB%20Focus%20May%2009.pdf?WT.cg_n=PIMCO-US&WT.ti=GCB%20Focus%20May%2009.pdf.

Local Government Financing Vehicles (LGFVs)[14] and repay debts with land financing. The latter partially leads to the real-estate market boom and associated asset bubbles (**Section 4**). In the corporate sector, credit resources are misallocated between enterprises and industries, causing over-indebtedness and overcapacity in State-Owned Enterprises (SOEs)[15] while credit shortage in private enterprises (non-SOEs). Therefore, these private enterprises tend to borrow more through the shadow banking system (**Section 5**). Household debt is also closely linked to the real-estate market with increasing mortgage loans supply and booming speculative investments; the recent innovations on consumer credit financing tools further boost the development of shadow banking activities and help the economic transformation towards consumption-driven economy (**Section 6**).

Figure 2.4: China's credit supply and demand



Source: author's research

[14] Local government financing vehicles ("LGFVs") refer to companies capitalized and owned by local governments for the purpose of raising funds for municipal infrastructure construction. It emerged in China in the 1980s as a response to the severe constraints on indebtedness by local governments themselves (Clarke & Lu, 2016).

[15] State-owned enterprises (SOEs) is enterprises where the government or state has significant control through full, majority, or significant minority ownership. While they may also have public policy objectives, SOEs should be differentiated from government agencies or state entities established to pursue purely nonfinancial objectives.

2.4 Summary

China experienced exponential growth over the last decades, throughout which investment (capital formation) has played an increasingly important role in driving economic growth: Deng's southern tour speeches in 1992 led to an instant rise in investment and hence the GDP growth; the fast industrialization after China's participation in the WTO further strengthened investment's contribution to GDP growth. Many studies also confirm this investment-led growth in China (e.g., Jun, 2003; Qin et al., 2006; Tang et al., 2008)[16], but few explore the drivers and mechanisms behind. This master thesis will hence dig one step deeper into them.

All in all, credit is the crux in this investment-led growth model, for its "out of nothing" credit creation and "circuit starters" role for production and investment. Whether credit can support economic growth depends on what the newly generated purchasing power is used for - real purposes or speculative transactions. The efficiency of this credit-investment-income feedback loop is also closely linked to the lending and borrowing behaviors, calling for further analysis of the credit supply and demand situations in China.

Since the investment-led growth has slowed after 2008, and many economic problems like structural imbalance and over-indebtedness have occurred, a closer look at credit and economic development can help to address debt problems and facilitate China's structural reform. Therefore, the following sections will expand the discussion and explore China's unique characteristics in this credit-investment-income process, based on the logical structure given in 2.3.

[16] Qin et al. (2006) review relevant literatures and give a detailed analysis of how much does investment drive the economic growth in China can; Jun (2003) further analyzes the investment efficiency in China; Tang et al. (2008) conduct quantitative research and confirm the bi-directional causality between domestic investment and economic growth.

3 China's credit market

As discussed in the last section, the credit market plays a crucial role in promoting economic development in China. In this section, the research aims to give further analysis on how credit is created and supplied from the financial system and how it generally influences the economic development in China. Because of limited credit data availability, the discussion will focus on the time range between 2002 to 2018. This section will first give a brief introduction to China's domestic credit market, with emphasis on the differences between the banking and shadow banking system. Then, a review of China's credit expansion history will be presented, and drivers will be analyzed. Lastly, a linkage between China's credit expansion and economic growth will be illustrated.

3.1 Introduction to China's Credit Market

3.1.1 Definition and characteristics of the credit market

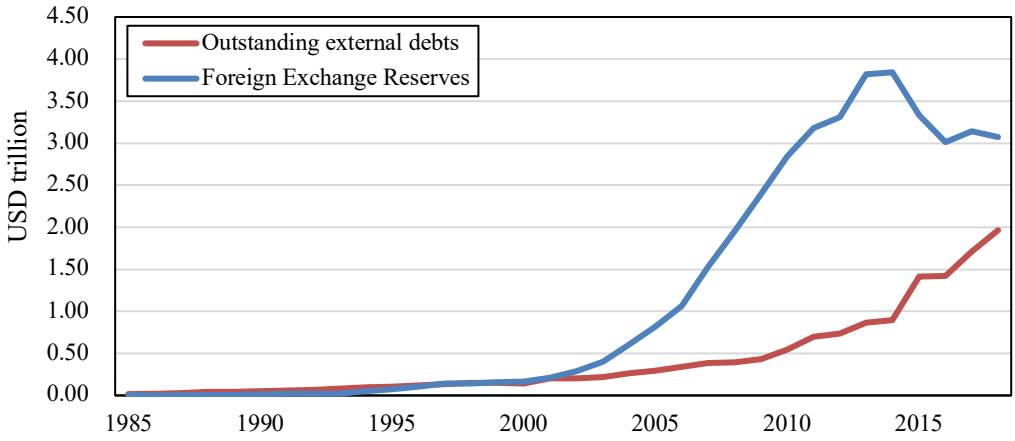
China's credit comes from both international and domestic credit markets. The credit from international credit markets, also known as external debt, refers to total debt a country owes to foreign creditors. It includes loans and bonds from foreign governments, private commercial banks, as well as international financial institutions such as the International Monetary Fund (IMF) and the World Bank. In 2018, the size of total outstanding external debts was 2.0 trillion USD, comprising 15% of the total GDP (13.3 USD trillion in 2018) (see **Figure 3.1**). Among them, nearly half of external debts flow to China's financial system such as the central bank (1%) and commercial banks (46%), 11% are foreign direct investments, and the rests flow to the real economy in the form of overseas loans and bonds (42%)[17,18]. The size of external debt (0.8 trillion USD) is only 2% to that of domestic debt (37.5 trillion USD, see **Figure 3.5**), which implies that external debt makes a neglectable impact on China's economic development compared to domestic debts. The total external debt is also well

[17] Source: see external debt position by sector at State Administration of Foreign Exchange (SAFE) https://www.safe.gov.cn/en/2018/0329/1412.html

[18] This master thesis will only focus on the non-financial sector credit, which is the credit to the real economy. The intra-financial credit (e.g., interbank lending) will not be discussed in this master thesis.

covered by foreign exchange reserve assets after the year 2000 (see **Figure 3.1**), indicating a strong balance sheet with fewer threats to financial stability. Considering its relatively small economic impacts and strong balance sheet performance, the discussion on China's external debt will stop here. In the following discussions, the master thesis will primarily focus on domestic credit to the real economy.

Figure 3.1: FX reserve assets and outstanding external debts: China, 1985-2018



Source: external debt data is published by State Administration of Foreign Exchange (SAFE), FX reserve data is published by The People's Bank of China (PBC), both data can be directly retrieved from trading economics database (see Appendix 2). Note: Foreign exchange reserve assets always exceed external debts after 2000.

In the broader sense, the domestic credit market in China refers to the market where loans, bonds, debt securities, and other financing tools like commercial papers are issued and traded. It is an aggregation of the bond market, loan market, and debt security market. It differs from the equity (stock) market where shares and equity securities are issued and traded. Financial institutions are primary credit suppliers in China's domestic credit market.[19] They can be divided into two parts: banks like policy banks and commercial banks, as well as non-banking financial companies (NBFCs) like trust companies and finance companies[20]. Through providing loans and helping corporations and organizations to issue bonds and debt securities,

[19] The financial institutions include banks depository institutions like policy banks, commercial banks, as well as non-bank institutions like urban and rural credit cooperatives, securities companies, insurance companies, trust companies, asset management companies and emerging finance companies (e.g. P2P, consumer credit companies, and auto financing companies. etc.).

[20] Finance companies are organizations that makes loans to individuals and businesses. Unlike a bank, a finance company does not receive cash deposits from clients, nor does it provide some other services common to banks, such as checking accounts. Finance companies include automotive finance companies, business development companies, commercial finance companies, commercial leasing companies, consumer finance companies, debt purchasers, factoring companies, fintech companies, payday lenders, residential mortgage companies and student-loan lending companies. Harris et al. (2018). *Finance Companies*. Available at Moody's: https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_1116508 (accessed April 30, 2019)

these financial institutions can inject liquidity into the real economy and promote economic development.

China's domestic credit can be supplied in different forms. The first and foremost one is traditional banking balance-sheet services, more specifically, the RMB and foreign currency loans from commercial banks, credit cooperatives, etc. Another form is debt raised through banking off-balance-sheet items, which includes entrust loans[21], trust loans[22], and undiscounted banker's acceptances[23]. These debts are not included in financial institutions' balance sheet and hence under weak regulation and control. The third channel is direct finance through debt contracts, which includes bonds and debts securities that offered for corporations and governments without using third-party services. The last form includes innovative credit tools like internet finance[24], wealth management products (WMPs)[25], and auto finance from NBFCs. These tools are good complements to traditional credit tools and free from the banking system's supervision. m

Overall, the domestic credit supply in China can be categorized into two systems: the banking system and the shadow banking system. Loans and bonds issued through banking balance-sheet items or direct financing are considered banking credit, while off-balance-sheet debt financing and these innovative credit tools are considered shadow banking activities that out

[21] Entrusted loans are lending arrangements organized by an agent bank between borrowers and lenders. In an entrusted loan, the agent bank is considered the trustee and the company providing the funds is considered the trustor. Entrusted loans are not included in the balance sheets of the agent banks, therefore the agent banks don't take any default risk.

[22] In China, trust loans refer to the the loans issued by trust companies, which act as trustees and help trustors to issue debts. They are considered as shadow banking activities, as they are NBFCs that under weak regulations from the central bank.

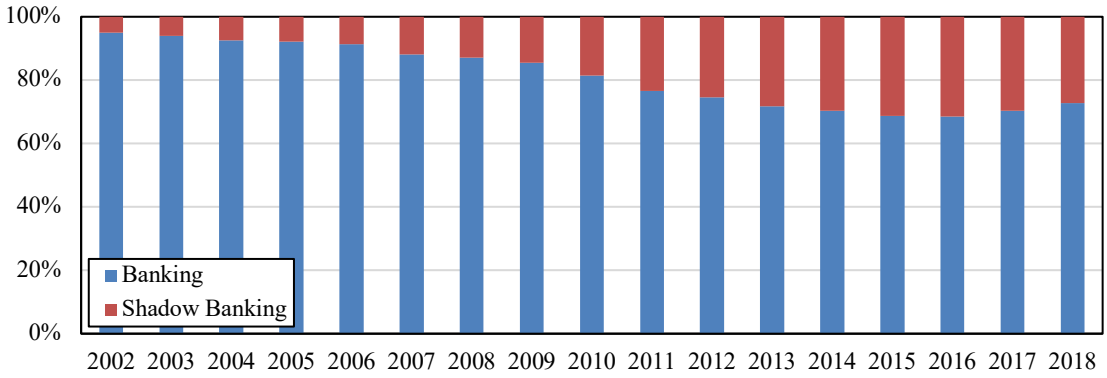
[23] Undiscounted bankers' acceptance is essentially a guarantee by a bank on behalf of a depositor (e.g., the bank guarantees that the depositor will repay a third party at a later date). As long as the depositor does not need to fall back on this guarantee, the banker's acceptance is undiscounted and hence off the balance sheet of the issuing bank (Hachem, 2018, p.293).

[24] Internet finance, which is often called as "digital finance" and "Fintech" outside China, refers to the new business model of utilizing the Internet and information communication technologies to accomplish a wide range of financial activities, such as third-party payment, online lending (P2P, internet consumer financial), direct sales of funds, crowdfunding, online insurance, and online banking. According to Guidelines for Promoting the Healthy Development of Internet Finance, which was issued by 10 ministries in July 2015.

[25] Wealth management products (WMPs) in China are investments that offer fixed rates of return well above regulated interest rates for deposits and are often used to fund investments in sectors where bank credit is restricted. They are typically actively managed by banks, with other firms commonly used as 'channels', but few are recorded on banks' balance sheets. Perry, E. & Weltewitz, F. (2015). Wealth Management Products in China. https://www.rba.gov.au/publications/bulletin/2015/jun/pdf/bu-0615-7.pdf (Accessed April 30 2019)

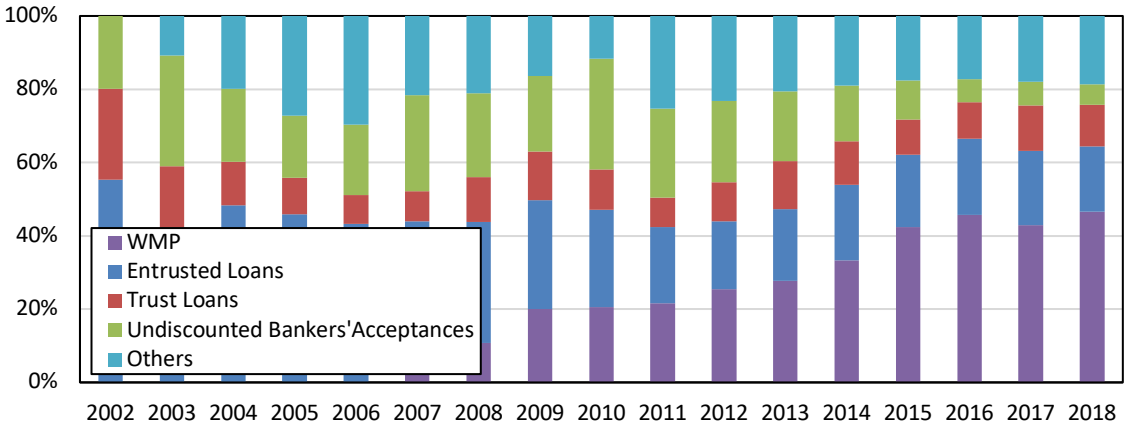
of the banking system's regulation and control. The core parts of China's shadow banking system are entrusted loans, trust loans, undiscounted bankers' acceptances, and WMPs[26].

Figure 3.2: Banking and shadow banking share in the credit market



Source: banking and shadow banking data are aggregated from total social financing (TSF) data from PBC, treasury bonds data from Chinese Academy of Social Science (CASS), and Moody's Shadow Banking Monitor. Aggregation and source detail please find in 3.1.2 Data sources and Appendix 2: Data sources. Note: The share of shadow banking credit is increasing.

Figure 3.3: Composition of the shadow banking system



Source: banking and shadow banking data is aggregated from total social financing (TSF) data from PBC, treasury bonds data from Chinese Academy of Social Science (CASS), and Moody's Shadow Banking Monitor. Aggregation and source detail please find in 3.1.2 Data sources and Appendix 2: Data sources. Note: the composition of wealth management products increased rapidly after 2012.

The shadow banking system plays an increasingly important role in China's financial system. It is a critical financing channel for private enterprises and local governments to complement their limited access to the banking credit (see discussion in Section 3 and Section 4). **Figure**

[26] The literature (cited in Chen, He & Liu, 2017) typically classifies trust loans (Allen et al. (2017)), entrusted loans (Allen et al. (2018); Chen et al. (2018b); He et al. (2018)), and undiscounted bank acceptance bills (An and Yu (2018)) as shadow banking activities as surveyed by Hachem (2018). WMPs are widely referred to as shadow banking activities, but they are not the ultimate users of funds (e.g., WMPs can be invested in trust loans).

3.2 shows that the composition of credit in the shadow banking system increased sharply from less than 5% in 2002 to nearly 30% in 2018. Among shadow banking financing tools, WMPs comprise the most substantial part, and its percentage in the shadow banking system also rose largely due to its advantages of higher return and less regulatory restrictions (see **Figure 3.3**).

3.1.2 Data sources

Our data comes from various sources including the People's Bank of China (PBC), State Administration of Foreign Exchange (SAFE), Chinese Academy of Social Science (CASS), Ministry of Finance (MOF), China Banking Regulatory Commission (CBRC), National Bureau of Statistics (NBS), Bank for International Settlement (BIS), Moody's and WIND database. Please find Appendix 2: Data sources for source URL and descriptions.

The external debts and FX reserve assets data is initially published by SAFE and PBC, and can be directly extracted from Wind or Trading Economics database. China's domestic credit to the real economy includes different loans and bonds issued by domestic financial institutions, and Total Social Financing (TSF, also referred as "Aggregate Financing to the Real Economy") can be a good proxy for this. TSF refers to the outstanding financing received by the real economy from domestic financial systems[27]. PBC publishes monthly data of Aggregate Financing to the Real Economy (Stock, at the end of period) from 2002, which covers the debt outstanding data of 10 indicators including RMB and foreign currency loans, entrusted loans, trust loans, undiscounted bankers' acceptance, net financing of corporate bonds, equity financing, local government special bond, asset-backed securities, and loan write-off.

However, based on the given credit market's definition and characteristics, TSF cannot fully reflect the domestic credit size, as it still includes equity financing data but not covers treasury bonds data. TSF doesn't count some shadow banking financing tools as well, such as wealth

[27] The real economy is considered as the part of a country's economy that produces goods and services, rather than the part that consists of financial services such as banks, stock markets. It consists of governments, non-financial enterprises and households, can be also regarded as the non-financial sector of the economy.

management products (WMPs), loans by finance companies, and informal financing. To estimate the actual size of the credit market, the thesis made some adjustments on TSF data. The final estimation for credit market size excludes the equity financing data but incorporates the treasury bonds and missed shadow banking data such as WMPs. Treasury bonds (central government bonds) is nearly the same size as central government debt and the data is published by CASS (2007-2014) and MOF (2014-2018); Wealth management products are published by Chinawealth.com (2007-2018); other shadow banking financing tools data can be directly extracted from Moody's quarterly china shadow banking monitor (2011-2018). Please find Appendix 4: Breakdown of financial credit and non-financial sector debt data for more aggregation and estimation details.

Additionally, CASS announces quarterly non-financial sector leverage ratio and balance sheet data in China (1993-2018), and BIS also publishes quarterly non-financial sector debt data of the world economies (1996-2018). There are some differences between these two statistics as their treatments to LGFVs and shadow banking data are different. This master thesis uses CASS data for debt decomposition within China and BIS data for comparisons between countries.

3.2 China's credit expansion and drivers behind

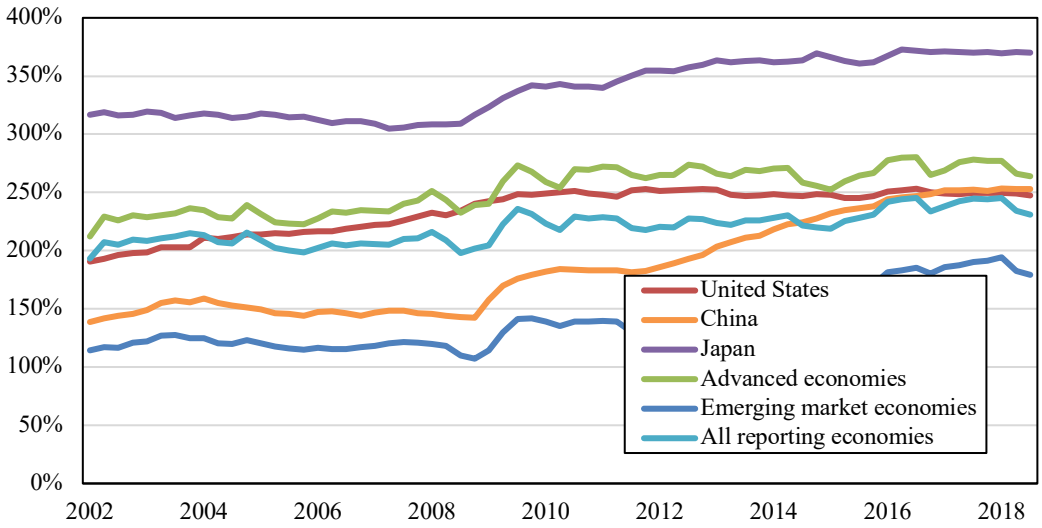
3.2.1 China's credit expansion and distribution

The credit in China's real economy has expanded rapidly, accounting for nearly half of all new credit created globally since 2002[28]. The expansion can be divided into three stages. The first stage is from 1978 to 2001, during which several critical financial reforms were conducted to set up the independent financial system (Huang et al., 2016). In 1983, the State Council announced to separate the functions of the central bank and commercial banks and

[28] Dawson, J., Etra, A. & Rosenblum, A. (Feb 27, 2017). *China's continuing credit boom.* Available at Federal Reserve Bank of New York: https://libertystreeteconomics.newyorkfed.org/2017/02/chinas-continuing-credit-boom.html (Accessed Apr 30, 2019)

aimed to establish a modern banking system with "Big Four"[29] as the core. The document "Decision of the State Council on Reform of the Financial Systemin" (December 25, 1993, No. 91)[30] in 1993 further emphasized the separation of the policy functions from the commercial banking operation and promoted the market-drive competition between "Big Four." The State Council also drew its first plan of interest rate liberalization to introduce market-based interest rate at the same year (Huang et al., 2016). Furthermore, the credit plan was officially abolished in 1998 and assigning credit quota became history[31], along with a series of policies to promote consumer credit (see discussion in Section 0), the commercialized banking system was fully-established, and credit market began to boom.

Figure 3.4: Non-financial sector credit-to-GDP ratio by countries: 2002-2018



Source: Bank for International Settlements (BIS) https://stats.bis.org/ Note: China's credit-to-GDP ratio first increase at the same rate as emerging economics and then outpaced all other economies

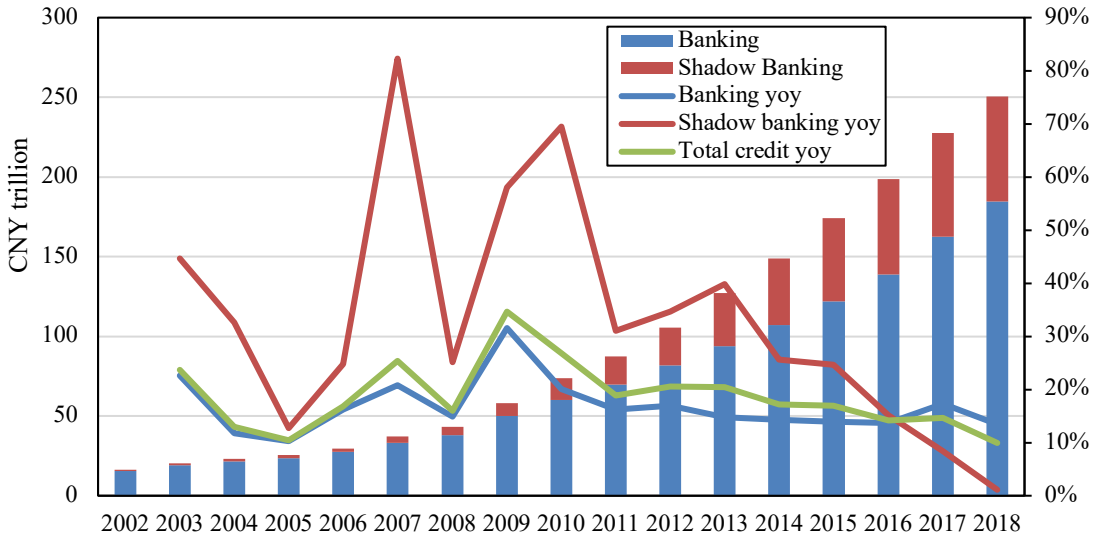
The second stage of China's credit market development is from 2002 to 2007 when shareholding system reforms to improve banking balance sheet quality and help commercial banks to seek listing became the key focus (Huang et al., 2016)[32]. These reforms intensified the competition between commercial banks, and stimulated them to oversupply loans to earn

[29] "Big Four" refers to the four big state-owned commercial banks in China, which includes Industrial and Commercial Bank of China, Bank of China, China Construction Bank, Agricultural Bank of China.
[30] See http://www.lawinfochina.com/display.aspx?lib=law&id=6265&CGid=
[31] Credit plan is a product of China's planned economy, it means that the central bank can decide the credit quota (volume) and credit allocation in the financial system.
[32] The Chinese shareholding reform is a form of privatization, in the sense that it provides a channel through which assets are transferred from the state to private hands (Ma, 1995).

more profits (see discussion in 3.2.2). At this stage, the credit expanded along with the fast growth of the economy, with its credit-to-GDP ratio leveling around 150% and the growth standing at a similar rate as other emerging economies (see **Figure 3.4**). The credit growth peaked in 2007, and the GDP growth also reached the historically highest level of 14% (see **Figure 3.5** and **Figure 2.1**).

After the 2008 GFC, China implemented the "4 trillion RMB stimulus plan" (see Appendix 1) to counteract the negative influences of GFC, and a set of monetary policies were conducted to stimulate credit supply (see discussion in 3.2.2) The size of new RMB loans[33] in 2009 was 9.6 trillion RMB (1.4 trillion USD), which was much higher than the historical average level (around 3 trillion RMB)[34]. Accordingly, its credit growth rate also outpaced all other economies after 2008 (see **Figure 3.4**). By 2018, its size was already five times larger than that in 2008 and the credit-to-GDP ratio nearly doubled. The current credit size in China is 254 trillion RMB (=37.5 trillion USD), which makes up 25% share of global credit; its credit-to-GDP ratio also reaches 250%, standing at the same level as advanced economies.

Figure 3.5: The size and growth rate of non-financial sector credit: China, 2002-2018



Source: banking and shadow banking data is aggregated from TSF data from PBC, treasury bonds data from CASS, and Moody's Shadow Banking Monitor. Aggregation and source detail please find in 3.1.2 Data sources

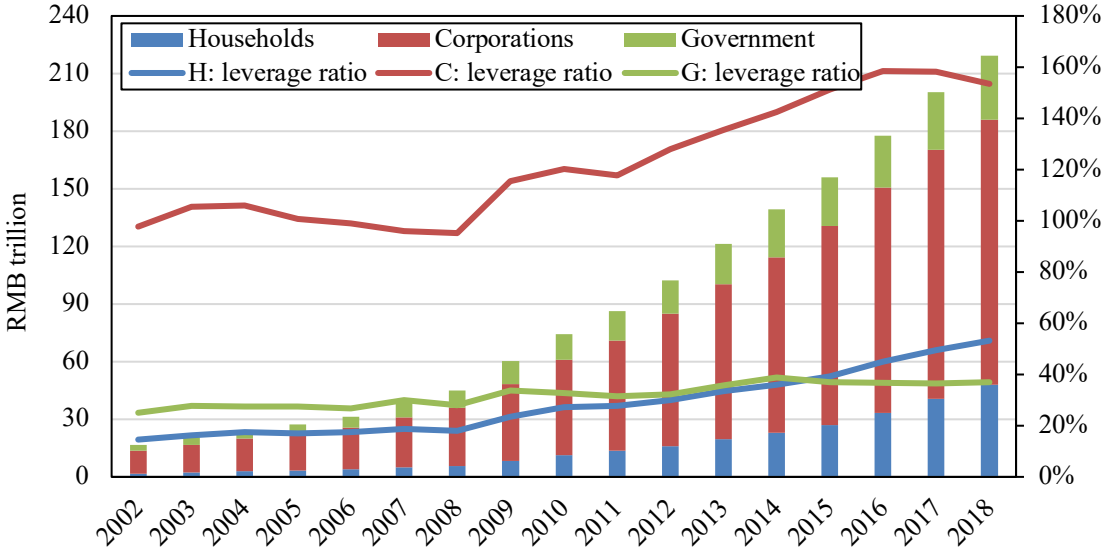
[33] New RMB loans refer to the increments of financial institutions Renminbi credit funds to non-financial corporations and households. The statistics is release by the People's Bank of China in monthly news, which can be extracted from Wind database terminal.

[34] See https://www.ceicdata.com/en/blog/china-new-loans

and Appendix 2: Data sources. Note: The size is on the left scale and growth rate (yoy) is on the right scale. Shadow banking expanded rapidly after GFC 2008.

To breakdown the credit expansion into the banking and shadow banking sector, it can be seen from **Figure 3.5** that the banking sector credit expanded with an average growth rate of 17% over the past 16 years. However, its composition in the credit market has decreased, with the shadow banking sector playing an increasingly important role (see **Figure 3.2**). The growth of shadow banking credit was more significant than banking credit. The average growth rate of shadow banking credit was 34%, which was twice of that in the banking sector (17%). Between 2006 and 2012, the shadow banking grew at an unusually high level around 60%, with its size increased rapidly from 3 trillion RMB in 2006 to 28 trillion RMB in 2012. Afterward, it still maintained a high growth rate beyond 20% until 2016, when several restrictive policies implemented to control shadow banking activities (see discussion in 3.2.3).

Figure 3.6: Non-financial credit expansion by sectors: China, 2002-2018

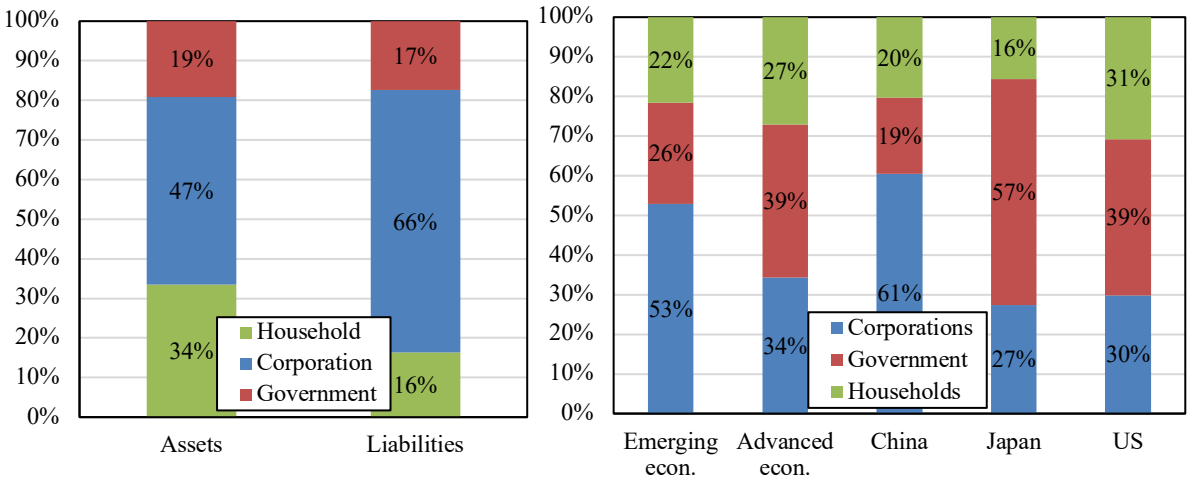


Source: published by CASS http://114.115.232.154:8080/ Note: sector leverage ratio is debt-to-GDP ratio (sector debt outstanding/national GDP). The left scale is for outstanding debt size while the right scale is for their leverage ratio. Corporate credit made up the biggest part and contributed to the most growth of non-financial credit.

The expanded credit mainly concentrated in the non-financial corporate sector (see **Figure 3.6**). The non-financial corporate sector occupied nearly two-thirds of credit resources, and its credit-to-GDP ratio rose most sharply over the last decades (from 98% in 2002 to 154% in 2018). Household credit expanded at a rate faster than the government sector. In 2002, its

credit-to-GDP ratio was only half of the government sector; in 2018, it already exceeded the government sector and reached a level of 53%. Overall, China's household and government sectors were much less leveraged compared to the corporate sector. Based on **Figure 3.7**, in 2013, the corporate sector only comprised 47% of the national asset but contributed to 66% of the liability, while the household sector accounted for 34% of the national asset but only bore 16% of the total liability.

Figure 3.7: Non-financial credit distribution by sectors



Source: the left chart national balance sheet data is published by CASS http://www.nifd.cn/writings/details/1080 and the right chart debt composition by country data is published by BIS https://stats.bis.org/. Note: the left chart is assets and liabilities distribution by sectors in China (2013); the right chart is debt distribution by sectors worldwide (2018). Net assets for all sectors are positive. However, their compositions in national assets and liabilities are different. Compared to other countries, China's corporate debt share is higher than average.

Compared to other countries, China's corporate debt share is almost twice as of advanced economies, while the government debt share is only half of that in advanced economies. On the one hand, it might because that SOEs, as an essential part of China's non-financial corporations, undertake many policy burdens[35] or government functions so that some part of government debt transfers to SOEs or LGFVs (see further discussion in Section 0). On the other hand, it implies that the household and government sectors still have space to leverage up while deleverage is especially needed in the corporate sector — this difference of credit distribution among countries worth more exploration in future researches.

[35] Policy burden is a term used in China, it means that state-owned enterprises (SOEs) sometimes need to undertake some government functions and responsibilities, such as providing employment, protecting national enterprises and maintaining social stability. Lin and Li (2008) give a detailed analysis on policy burden, with emphasis on its influence on privatization and soft budge constraints.

3.2.2 Drivers behind banking credit expansion

Monetary policies and institutional factors have played a critical role in China's credit expansion. The credit expansion between 2002-2007 was mainly a natural result of the establishment of the modern banking system and the abolishment of credit plan (Herr, 2010; Huang et al., 2016; also see discussions in 3.2.1). Prolonged low benchmark interest rate between 2002 and 2007 also largely promoted credit demand as it means low funding cost[36], and hence strengthened the credit expansion motivation of financial institutions.

Moreover, Pan, Miu & Chen (2011) point out that institutional factors like commercial banks profit-making mechanism can influence the banking credit supply. The main profits of commercial banks come from the interest rate spread between loans and deposits. Since the liberalization of interest rate and credit pricing has not been fully achieved, commercial banks tend to expand their credit supply to gain more profit. This trend has worsened between 2002 and 2007 as increasing numbers of banks would like to go IPO and improve their profitability through increasing credit supply. Additionally, the share of non-state-owned commercial banks and emerging financial companies is increasing, which causes intensified competition in the credit market (Huang et al., 2016). Therefore, banks tend to issue more loans and bonds to seize more market share in the credit market.

The accelerated credit expansion right after 2008 (most significantly in 2009 and 2010) was a direct result of "4 trillion RMB stimulus plan". To facilitate "4 trillion RMB stimulus plan" and stimulate credit supply, the central bank has lowered the required reserve ratios three times and cut down benchmark interest rates four times in the fourth quarter of 2008[37]. Many studies have confirmed the role of these monetary policies in driving recent credit expansion in China (Bai et al., 2016; Cong et al., 2018; Chen & Kang, 2018). At the same time, the China Banking Regulatory Commission (CBRC) removed credit volume controls of commercial bank loans and the restrictions on the loan-deposit ratio, which also contributed

[36] Between 2002 and 2007, the benchmark interest rate was fluctuating at a historically low level around 6%. See trading economics database: https://tradingeconomics.com/china/interest-rate

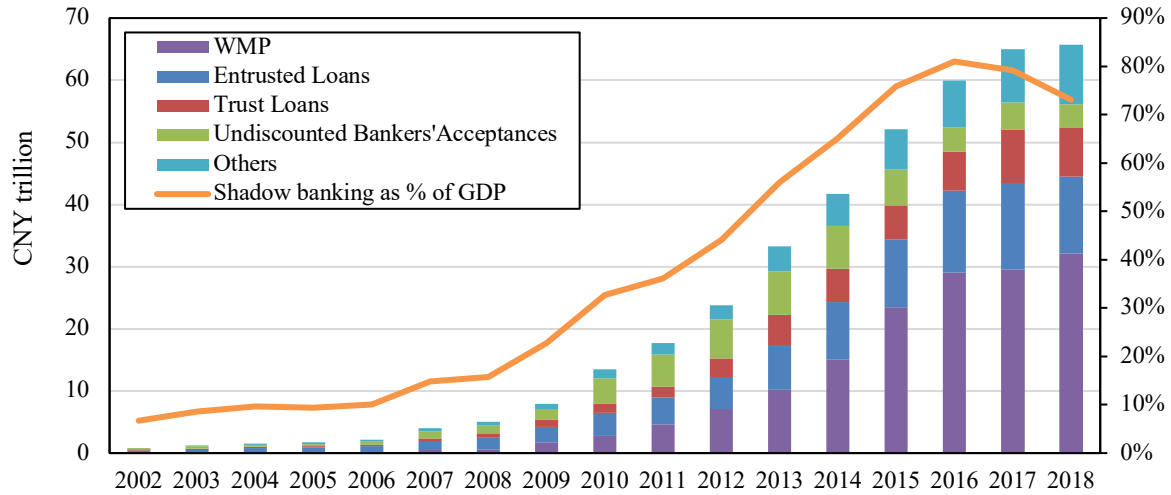
[37] The required reserve ratios was down from 17.5% to 16% and from 16.5% to 13.5% for large and small financial institutions, respectively. The one-year deposit and loan rates from 4.14% and 7.2% to 2.25% and 5.31%, respectively. See trading economics database: https://tradingeconomics.com/china/cash-reserve-ratio

to the increased credit supply from the banking system. Pan, Miu & Chen (2011) point out, as the loan-deposit ratio was at a low level around 65% in previous years, increasing credit supply can be an effective way to narrow the loan deposit gap and release the excess liquidity in the banking sector.

3.2.3 Drivers behind shadow banking development

The shadow banking sector has expanded rapidly over the last decade. It can be seen from **Figure 3.8** that the size of shadow banking credit reached 65.8 trillion RMB in 2018, accounting for 73% of total GDP in 2018. It is also interesting to see that the expansion has slowed and even reversed in recent years, due to intensified regulations on WMPs and trust companies. The announcement of Guiding Opinions on Regulating the Asset Management Business of Financial Institutions (No.106 [2018] of the People's Bank of China, the "Guiding Opinions")[38] put restrictions on shadow banking activities, with particular emphasis on WMPs. Analysis of drivers behind the shadow banking sector can help us to understand the development trends in the future credit market better[39].

Figure 3.8: The credit expansion in the shadow banking sector: China, 2002-2018



Source: shadow banking data is aggregated from TSF data and Moody's Shadow Banking Monitor. Aggregation and source detail please find in 3.1.2 Data sources and Appendix 2: Data sources. Note: the left scale is shadow

[38] English translation available at Pku Law: https://www.pkulaw.com/en_news/1165fc33a15da993bdfb.html
[39] Hsu & Li (2015), Liang (2016), Chen, He & Liu (2017), Ehler, Kong & Zhu (2018), and Hachem (2018) conducted detailed research on shadow banking activities in China.

banking credit size and the right scale is shadow banking credit-to-GDP ratio. shadow banking credit expanded rapidly until 2016 when several restrictive policies implemented.

Based on **Figure 3.8**, the expansion of shadow banking is mainly driven by wealth management products (WMPs). WMPs are short-term saving and financing products that offer high returns and often invest in risky assets[40]. It emerged in 2005 when the Chinese government expanded the range of financial services commercial banks could provide, and then became an attractive saving and investing vehicle for households (Hachem, 2018). Banks, especially small and medium-sized banks, are the primary provider of WMPs. They use WMPs for regulatory arbitrage as they are off-balance sheet items and have less regulatory restrictions (Hachem, 2018; Liang, 2016; Chen, He and Liu, 2017). Since competition is intensifying in the credit market and WMPs can offer higher returns than bank deposits, small and medium-sized banks especially prefer to sell more WMPs to attract individual investors and hence to compete with the Big Four banks (Chen, He & Liu, 2017).

The stimulus-loan-hangover effects can explain the boom of shadow banking activities. Chen, He & Liu (2017) study the drivers behind this boom and find that the inelastic demand for continuing the long-term infrastructure projects started in 2009, together with the mounting rollover pressure of LGFVs that needed to repay maturing bank loans about four or five years later, played an essential role in driving the surge of shadow banking activities in China. They highlight the rollover channel, that local governments needed to roll over their coming due bank loans by non-banking financing sources such as trust loans and Municipal Corporate Bonds (MCBs)[41]. They also point out that the links between WMPs and these non-bank financing sources are significant, as WMPs purchase 60% of trust loans and 70% of MCBs (Chen, He & Liu, 2017).

From the demand side, skewed bank lending preferences also boost the development of shadow banking activities in China. Hsu & Li (2015) point out bank credit's skewness towards SOEs and local governments' limited access to direct financing push private and institutional borrowers to the shadow banking sector. Furthermore, as shadow banking

[40] WMPs are referred to as shadow banking activities, but they are not the ultimate users of funds (e.g., WMPs can be invested in trust loans).
[41] It is also called as "Chengtou Bonds", which are issued by LGFVs, and hence are corporate bonds legally; but have implicit guarantees from corresponding local governments, and hence enjoy the extra safety of municipal bonds.

products have a higher return than banking deposits (e.g., WMPs offer 2% higher annual interest more than deposits) , they also attract large numbers of individual investors with excess liquidity to invest in shadow banking products (Chen, He & Li, 2017),.

3.3 The influence of China's credit expansion

3.3.1 The relationship between credit development and economic growth

Many economists believe that financial innovation and liquidity increase will bring benefits to economic development. The statement that financial development (i.e., credit development) could promote economic growth firstly presented through the book of Schumpeter (1911) "Economic Development Theory," in which he believes financial services such as bank credit can promote economic growth by funding technological innovation. After Schumpeter, Robinson (1952), Goldsmith (1969), McKinnon (1973) and Shaw (1973) continue the research about the linkage between financial development and economic growth, contend that credit development could enhance the economic growth by improving the efficiency of fund allocation and promoting capital accumulation. Benefit from their work, the importance of credit on economic growth is widely acknowledged.

Subsequent to these theoretical research, King and Levine (1993) reexamine the relationship between financial development and economic growth using 80 countries' credit data over 1960-1989. They confirm that bank credit could stimulate economic growth through two channels: on the one hand, financial deepening can increase resource mobility, lower investment cost and thus increase productive investments; on the other hand, it can enhance allocation efficiency of financial resource and thus improve the productivity.

However, bank credit cannot always promote economic growth. Based on "Debt-Deflation Theory" from Fisher (1932) and followed "Financial Accelerator Theory" from Bernanke (1996), the high leverage ratios in the real economy can trigger debt-deflation cycles and

cause economic recessions. Once the debt accumulated excessively, banks will tighten credit supply, and borrowers hence have to constrict their investment or consumption.

Furthermore, based on Werner (2005, 2009, 2010)'s credit creation theory as discussed in 2.2, if the new credit in the financial system is used for speculative investments rather than productive or consumptive purposes, it will damage the economic growth in the long-run. On the one hand, the overheating of speculative investments will crowd out productive investments and cut down consumptions. On the other hand, it will push up asset prices and cause asset bubbles. Once these bubbles collapse, borrowers will face a shrinkage of their assets and a reduction of cash flow generated from these assets (e.g., rentals from real-estate assets). As a result, they may need to sell off their asset to repay the debts, leading to a further decrease in asset prices (Minsky, 1975).

3.3.2 The case in China

In the context of China, credit has experienced continued expansion since 2002. However, its influences on economic development are different in different periods.

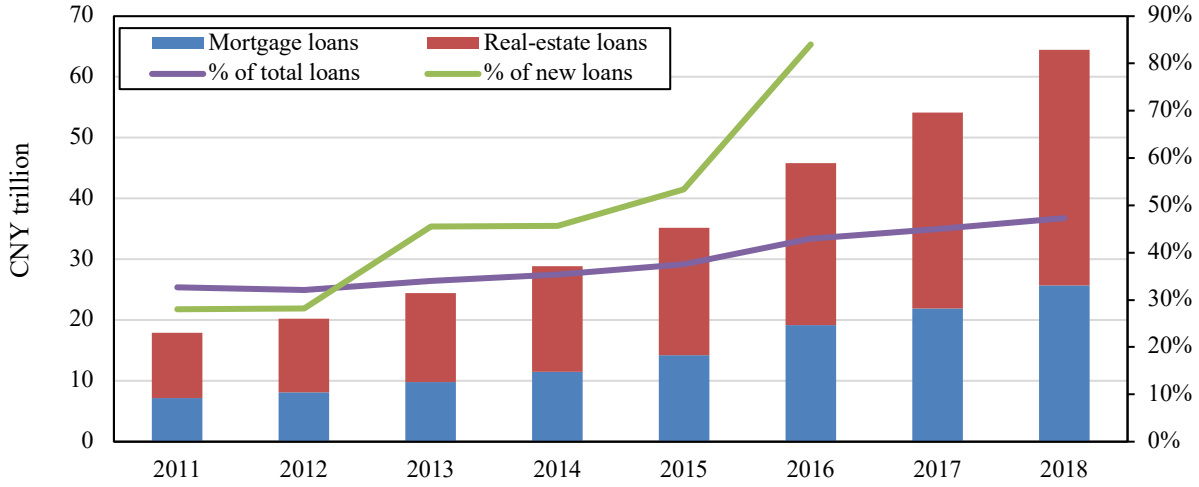
Before 2001 when China joined the WTO, the researches about credit and economic growth were relatively insufficient due to weak data availability, and most suggest that the contribution of bank credit to economic growth is insignificant or even harmful. Boyreau-Debray (2003) and Zhang (2006) confirm the insignificant correlation between bank credit and economic growth in China using credit data between 1990-1999 and 1987-2001 separately. They explain this week correlation in that the financial market and credit system were not yet well-established, and credit allocation was insufficient and inefficient under credit plan (Zhang, 2006).

After 2002 and before the GFC in 2008, the promoting effect of bank credit to economic development was increasingly significant. Zhang, Wangb & Wang (2012) confirm the positive correlation between bank credit and economic growth using credit data over the

period 2001–2006. They suggest that the shareholding system reforms that have taken place after China's accession to the WTO are in the right direction. However, the research on the credit allocation during this period and its specific impacts on economic growth (whether promote TFP growth) are far from efficient, which needs further studies after this thesis.

After the GFC in 2008, credit expansion plays a weakening role in promoting economic growth. Pan & Zhu (2014) and Dawson & Rosenblum (2017) say that credit in China offers less boost to economic growth than it used to do. Chen and Kang (2018) point out that China's growth right after the GFC (2009, 2010) was supported by rapid credit growth, though investment and credit efficiency (contribution to TFP growth) has fallen and financial performance of corporates (profitability, leverage, debt servicing capacity), in particular of SOEs, has deteriorated. Cong et al. (2018) study the impact of stimulus-driven credit expansion on firms and confirm that credit has favored SOEs and firms with lower productivity. This inefficient credit allocation among firms may further damage the economic growth in the long run. As for credit allocation among industries, Pan & Zhu (2014) study it using Hubei Province as an example. They find, in the secondary industry, credit expansion increases the output in the short term, while in the tertiary sector, credit expansion have positive but lagging effects on economic growth.

Figure 3.9: The development of real estate related loans: China, 2011-2018



Source: published by PBC, can be retrieved from Wind and CEIC database https://www.ceicdata.com/en/china/loan/loan-new-increased-real-estate Note: real estate loans refer to loans that are used for real estate development, mortgage loans refer to loans for the purchase of ordinary houses. Size is on the left scale while the percentage is on the right scale. % of total loans is the total outstanding of

mortgage loans and real-estate loans divided by total loan balance of financial institutions, while % of new loans is the newly increased mortgage loans and real-estate loans divided by newly issued loans from financial institutions. The shares of real-estate related loans in bank total and newly increased loans are increasing.

Furthermore, China's recent credit expansion is closely linked to the real estate market development, as loans to households, real estate developers, local governments, and firms that are either explicitly or implicitly backed by real estate assets (Liu & Xiong, 2018). It can also be seen from **Figure 3.9** that real-estate related loans (i.e., mortgage loans and real-estate loans) have reached 47% of total RMB loans. Among newly issued RMB loans in recent years, the share of real-estate related loans also increased sharply. In 2016, this number was 84%, implying a massive exposure of bank credit to the real estate market and excess real-estate investments. As discussed, the increasing speculative investments in real estate assets may lead to asset bubbles and debt-deflation cycle, which makes further analysis of how bank credit can influence the real-estate market development necessary.

3.3.3 Threats to financial stability

China's credit expansion may threaten its financial stability considering its large size, sharp rise, and long-lasting time. In August 2016, Moody's warned that China's banking system faces systemic risks from rising reliance on shadow banking financing[42]. In May 2017. Moody's further downgraded China's rating from Aa3 to A1 with a concern of rising debt across the economy[43].

Theoretically, based on "Financial Instability Theory" from Minsky (1986), after a prolonged economic boom, the risk preference will rise, and speculative investments will increase, leading to the debt expansion and cash flow crisis (i.e., the generated cash flow cannot pay debt interests). In this case, enterprises tend to sell their assets to maintain steady operational cash flow and repay debt interests, hence causing asset price collapse and triggering a debt-deflation cycle.

[42] See https://www.moodys.com/research/Moodys-Chinas-banking-system-faces-systemic-risk-from-significantly-higher--PR_354245
[43] See https://www.moodys.com/research/Moodys-downgrades-Chinas-rating-to-A1-from-Aa3-and-changes--PR_366139

Chen & Kang (2018) have observed that the credit boom in China is the most prolonged among all identified 43 countries since 1996[44]. They find that the credit expansion in China has continued 15 years, and no downturn has ever experienced since 2003. They also examine the linkage between the credit boom and financial crisis. They find that among identified 43 countries in which the credit-to-GDP ratio increased by more than 30 % in a 5-year period, only five ended without a financial crisis in the immediate aftermath. These international experiences have indicated that the fast accumulation of bank credit will pose risks in financial stability (Gourinchas & Obstfeld, 2012; Jorda et al., 2010; Reinhart & Rogoff, 2010). Dell'Ariccia et al. (2016) further point out that the longer and sharper of the credit expansion, the higher the probability of a financial crisis.

Recent research shows that systemic risks in China's financial system have risen since 2014. Li et al. (2014) run a stress test on China's banking system and confirm the existence of liquidity shortage risks. Avkiran and Mi (2017) also find that the capital adequacy ratios of the "Big Four" exceeded the minima laid down by "Capital Accord" by a large margin, and at the same time the interconnectedness in the financial system had risen between 2013 and 2015. Based on Roukny (2018)'s finding, the interconnectedness is a source of uncertainty in systemic financial risks and can potentially contribute to the next global financial crisis. Huang, Haan & Scholtens (2017) also prove that China's banking system is at higher risk according to comparisons of risk indicators (e.g., conditional value at risk, the systemic impact index, and the vulnerability index approaches) with countries like Korea and the US.

Moreover, the increasing shadow banking activities are recognized as a source of financial instability (Li & Xue, 2014; Hsu & Li, 2015; Liang, 2016; Ehlers et al., 2018) Li & Xue (2014) confirm that the trust company was one source of financial instability, and commercial banks suffered the most from the adverse impacts. Liang (2016) further points out that risks in the shadow banking system come not only from risky financial products but also due to the close interconnectedness between the shadow banking and the traditional banking sector. He

[44] To better understand the behavior of credit in China, Chen and Kang (2018) use a turning point algorithm as per Harding and Pagan (2002) on log-level of credit series, deflated by the GDP deflator, from BIS (BIS data is used given its longer history going back to 1996)
.

also claims that the growth of shadow banking will worsen China's over-reliance on credit-driven investment growth and intensify the over-indebtedness in non-financial sectors.

Despite systemic vulnerabilities in the financial system, China has several unique features to help it get rid of associated risks. Chen & Kang (2018) conclude that factors like low reliance on foreign financing, effective capital control, and a strong balance sheet in the government sector enable China to buffer these risks in the short-term. However, if these risks remain unsolved in the long run, these buffering factors will make the credit boom larger and last longer, posing higher risks of a financial crisis. Therefore, proper policies are needed to regulate and control China's credit expansion and increasing shadow banking activities.

3.4 Summary

China's credit has expanded rapidly with its growth rate outpacing all other economies since 2008[45]. The credit comes from both banking and shadow banking systems, with the latter playing an increasingly important role. The created credit mainly concentrated in the non-financial corporate sector and contributed most to the non-financial sector credit growth; China's corporate debt share (61% in 2018) in the non-financial sector is nearly twice of that in advanced economies (averagely 34%) while government debt share (19%) is only half of them (39%), showing a different credit distribution feature that worth for further exploration.

Institutional factors within the banking system are the essential driving force for China's credit expansion. Since 1983, several financial have been made to establish a modern banking system with an aim to stimulate economic growth under monetary policy control. As a result, commercial banks expanded credit supply in order to seek profits from interest rate spread, with the intention to compete in the credit market and prepare for IPO.

Monetary policy also plays an increasingly important role in adjusting and promoting credit supply in China. Prolonged low interest rate (i.e., low financing cost) after 2002 largely

[45] All economies refer to the recorded/reported countries in BIS credit database. https://stats.bis.org/

stimulate the credit demand and hence the credit expansion motivation of financial institutions. Furthermore, a series of loose monetary policies for facilitating "4 trillion RMB stimulus plan" (e.g., lowering the required reserve ratio, cutting down the benchmark interest rate, removing the credit volume control) also stimulate the credit supply after 2008. However, the transmission mechanisms behind this credit channel of Chinese monetary policies are under research, and a further look is suggested.

Moreover, increasingly shadow banking activities, which mainly driven by wealth management products (WMPs) growth and stimulus-loan-hangover effects, exacerbated the credit boom in China. Besides, local governments' limited access to direct financing and skewness of bank credit towards SOEs also pushed borrowers to the shadow banking sector, and further analyses will be provided in the following sections.

Credit can boost economic growth by enhancing resource allocation efficiency or increasing productive investment. In China, the correlation between bank credit and economic growth only became significant after the year 2002, when the modern banking system was almost established. However, the boosting effect of credit has been weakened in recent years due to inefficient credit allocation, as credit favored SOEs and firms with lower productivity.

To dig more into the credit allocation efficiency in China, further breakdown of credit into government, non-financial corporate and household sectors are necessary. In the following sections, detailed research on these decomposed credits as well as their influence on economic development will be provided.

4 Government debt

China's government debt expansion is closely linked to its fiscal policy. The 2009 stimulus package accelerated the debt expansion in the government sector, especially among local governments. In this section, features and the development history of China's government debt will be given first. Then, a further discussion on the relationship between government debt expansion and economic development will be elaborated, with an emphasis on its linkage to the real estate market development.

4.1 Introduction to China's government debt

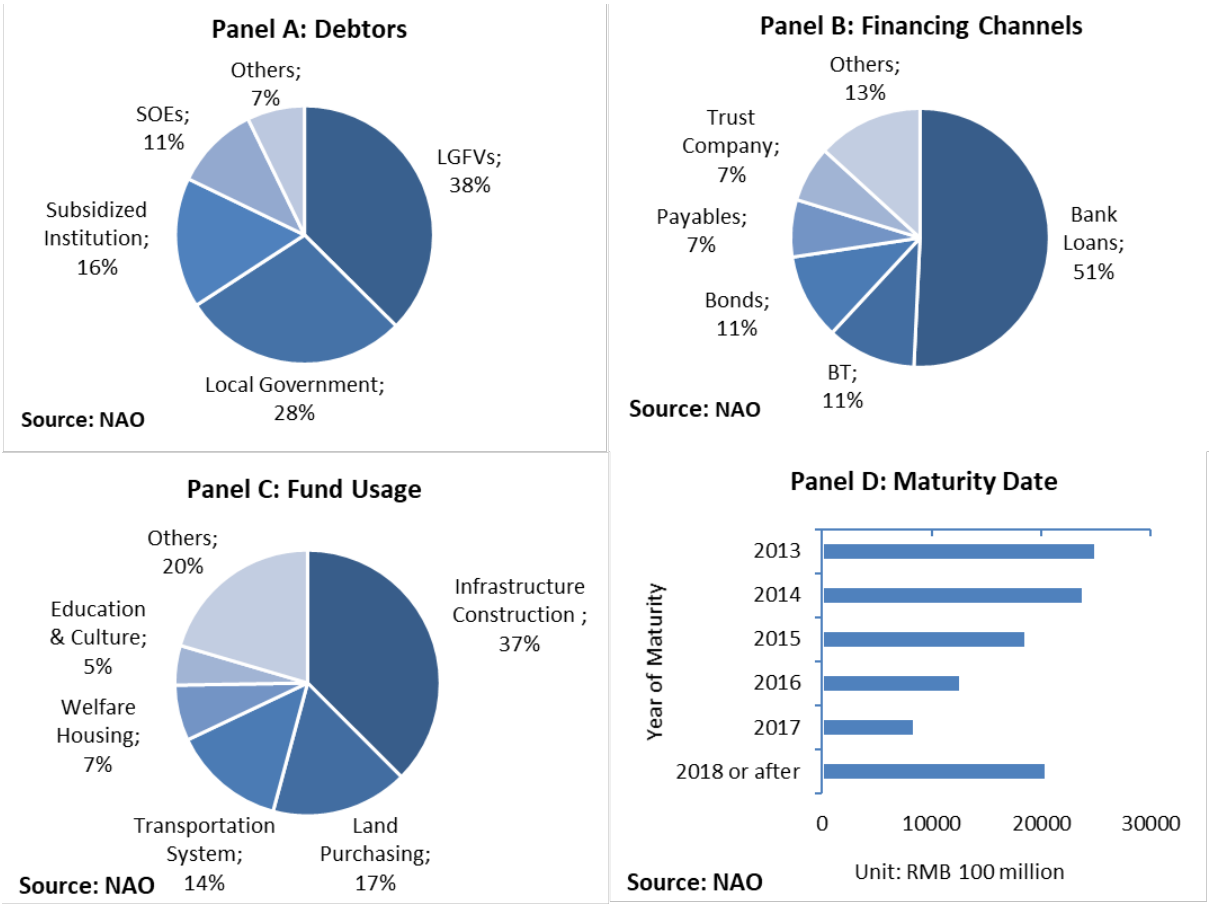
4.1.1 Definition and characteristics of government debt

The government debt, or public debt, refers to the bonds issued by the government domestically and abroad. In China, it can be further categorized as central government debt and local government debt. The former indicates the debt of the central government borrowed to offset the fiscal deficit, adjust the interest rate and money supply, while the latter refers to the debt directly borrowed by local governments and local government financing vehicles (LGFVs) for infrastructure construction and welfare projects.

Central government debt was 14.9 trillion RMB (2.2 trillion USD) in 2018, comprising 17% of the total GDP. Treasury Bonds issued by the Ministry of Finance on behalf of the central government are the primary sources of internal government debt. Through the issuance of treasury bonds, the central government can regulate the macroeconomy and close the fiscal deficit gap without increasing tax rates. In the meantime, it can also turn extra savings into investments and therefore promote sustainable growth of the economy (Zhu, Lin & Wang, 2018). As a relatively safe asset, treasury bonds are primarily purchased by commercial banks, with ownership of 55% in 2012[46].

[46] Data source: China Central Depository & Clearing Co., Ltd. (CCDC), Shanghai Clearing House, http://www.nafmii.org.cn/scyjfx/gkwz/201312/P020131213631119444399.pdf

Figure 4.1: Local government debt structure: China, 2013[47]



Local government debt can be decomposed by fund usage, debtor, financing channel and maturity date. In 2018, the local government debt was 18.4 trillion RMB (2.7 trillion USD) or 20% of total GDP (see **Figure 4.2**). To understand the feature of local government debt, the National Audit Office (NAO) conducted two nationwide surveys in 2011 and 2013[48], providing a detailed breakdown of local government debt. Based on **Figure 4.1 - Panel C**, nearly 80% of funds raised by local governments flow to infrastructure and welfare projects, which promote not only regional economic growth but also local living standards. Besides, investments in transportation and welfare housing can generate continuous revenues, which could, in turn, be a source of funds to repay local government debt.

[47] Refer to: The National Audit Office Announcement No. 32 (2013) http://www.audit.gov.cn/n5/n25/c63642/part/27403.pdf
[48] Source: the National Audit Office (NAO). Announcement No. 35 (2011) http://www.audit.gov.cn/n5/n25/c63566/content.html; Announcement No. 32 (2013) http://www.audit.gov.cn/n5/n25/c63642/part/27403.pdf ; both in Chinese.

Among debtors **(Figure 4.1 - Panel A**), Local Government Financial Vehicles (LGFVs) are the largest, raising nearly 40% of total local government debt in 2013. LGFVs emerged in China in the 1990s with the introduction of "tax-sharing system,"[49] through which fewer fiscal revenues but more expenditure responsibilities were allocated to local governments. To close the gap between fiscal expenditures and revenues, local governments use LGFVs as financing vehicles to obtain bank loans or issue bonds (Wu, 2015), therefore bypassing the prohibition of the Budget Law[50]. Local governments themselves are also important borrowers. However, they faced restrictions in issuing bonds or borrowing from banks before 2015, and therefore preferred to raise additional debts through LGFVs and SOEs.

The principal owners of local government debt are banks, which account for 57% of total debt in 2013 (**Figure 4.1 - Panel B**). The actual size of financing from the banking system should exceed the reported percentage in consideration of shadow banking activities. Furthermore, most bonds issued by local governments (i.e., MCBs) or LGFVs are purchased by bank wealth management products (Chen, He & Liu, 2017). Banks also lend to trust companies and private equity companies, which then make loans to local governments or finance PPP projects through BT[51]. Based on the figure, nearly 30% of local government debt is raised through the shadow banking system.

Contingent government debt. Usually, government debt refers to the direct liabilities that the government need to repay with the financial funds[52]. However, there are another two categories of government debt: "government debt with guarantee responsibility"[53] and "government debt with possible bailout responsibility,"[54] which are usually regarded as a

[49] The tax-sharing system was carried out by the central government in 1994 and can be regarded as a blanket dismissal of the fiscal responsibility system. The reform was characterized by the centralization of fiscal revenues obtained by local governments and the authority over taxation and expenditure responsibilities (Zhou & Tan, 2017).
[50] Budget Law prohibited local governments to issue bonds before 2015; this regulation relaxed in 2015 and then local governments were able to issue bonds by themselves.
[51] "Built-to-transfer" is a source of financing for Public-Private-Partnership (PPP) Projects; it is in the same nature as "Borrowing from entities & individuals," which involves private entities and local governments.
[52] Financial funds refer to local governments' tax revenues; non-financial funds refer to their non-tax revenues.
[53] Local governments providing direct or indirect guarantees to debtors like public utilities and LGFVs. When the debtor is unable to repay the debt, the government has to bear the liabilities of joint and several liability with non-financial funds.
[54] The government is not legally liable for debts of this type, but when the debtor has a debt crisis, the government may need to take responsibility for the rescue. It refers to LGFVs, financial subsidies and public utilities that lend for public welfare projects. Debt is repaid by non-financial funds and not guaranteed by the local governments.

contingent liabilities or hidden debt[55] that only need local governments to repay when the actual debtors unable to pay. Assuming that hidden debt grew at the same rate with local government debt, it can be estimated from NAO data that China's hidden debt was 11.3 trillion RMB by the end of 2018 (see below section). Most of this hidden debt is associated with LGFVs and PPP projects, but to what extent local governments are exposed is indistinct.

4.1.2 Data sources

Our data comes from various sources including Chinese Academy of Social Science (CASS), Ministry of Finance (MOF), People's Bank of China (PBC), National Audit Office (NAO), and Bank for International Settlement (BIS). Please see **Appendix 2: Data sources** for more reference details.

Annual central and local government leverage data in China is published by CASS from 1993 to the present. BIS provides country-level quarterly general government debt (aggregation of central and local government debt) data from 1996 to present. The government data published by CASS and BIS is different[56], as their treatment to LGFVs' debt (whether belong to corporate debt or government debt) is different. In 2010 and 2013, the National Audit Commission (NAO) conducted nationwide and provincial surveys on government debt and provided a detailed breakdown on both direct and contingent government debt. Additionally, the Ministry of Finances (MOF) publishes central government debt data since 2005 and provincial local debt outstanding and budget data since 2014.

Nevertheless, those numbers published by BIS and CASS may understate the actual size of the local government because of the omission of contingent government debt. Little official data has been made public as hidden debts are in weak regulation and control. Therefore, many studies try to calculate local government debt by summing up debts from different financing channels instead of directly using CASS or BIS data. For example, Huang (2019)

[55] Contingent liabilities are liabilities that may be incurred by an entity depending on the outcome of an uncertain future event such as the outcome of a pending lawsuit. These liabilities are not recorded in a company's accounts and shown in the balance sheet when both probable and reasonably estimable as 'contingency' or 'worst case' financial outcome.
[56] In 2017, the BIS government debt-to GDP ratio is 47% while that in CASS is 37%.

uses the information of LGFVs' public financial statements to aggregate loans and bonds data from all financing channels and get a relatively accurate estimation for prefectural-level local government debt.

It is also possible to estimate contingent government debt separately. Zhong & Lu (2015) and Chen & Li (2015) use Chengtou Bond as a proxy for hidden government debt estimation[57]. Similarly, Pu and Wang (2014) aggregate the bank loans to LGFVs, while Ambrose et al. (2015) use the bonds issued by LGFVs to measure hidden local government debt[58]. In this master thesis, the government contingent data is estimated based on NAO data for the period from 2007 to 2017. The contingent local government debt outstanding in 2010, 2012, and 2013H1, as well as the debt growth rate between 1997 and 2010, are available in 2010 and 2013 NAO reports. The following year's debt growth rate can be assumed the same as local government debt. With some interpolation, contingent government debt ("government debt with guarantee responsibility" and "government debt with possible bailout responsibility") can be quickly figured out.

4.2 Government debt expansion and drivers behind

4.2.1 Government debt evolution

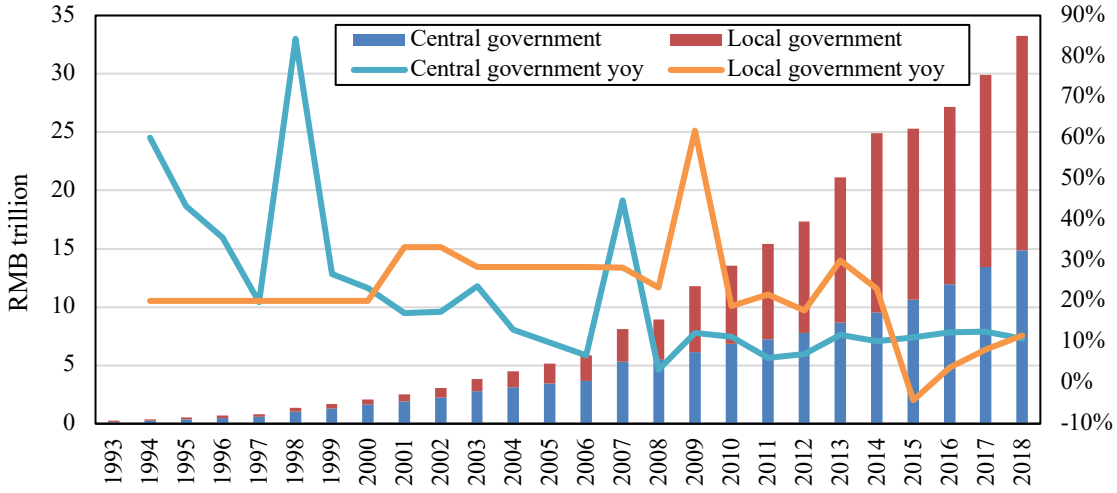
China's government debt has increased substantially over the last decades, from 1.3 trillion RMB in 1998 to 33 trillion in 2018, reaching 36% of total GDP. The government debt evolution can be roughly divided into two stages by the GFC in 2008. Before 2008, the central government debt comprised most of the government debt, and its debt-to-GDP ratio was averagely 10% higher than that of local government debt; and after 2008, the local

[57] Municipal Corporate Bonds (MCBs) or Chengtou Bonds are issued by LGFVs in five forms: exchange-traded corporate bonds, enterprise bonds, medium-term notes, short-term financing bills, and private placement notes. For each Chengtou bond issuance, WIND provides the bond-specific information, including issuing amount, issuing date, maturity date, issuer's province, and the purpose of the raised funds.

[58] Data on bank loan balance of LGFVs before 2012 are from various validated news sources and are collected by WIND. Annual Municipality-Trust cooperation data are reported officially by the China Trustee Association and are available on WIND.

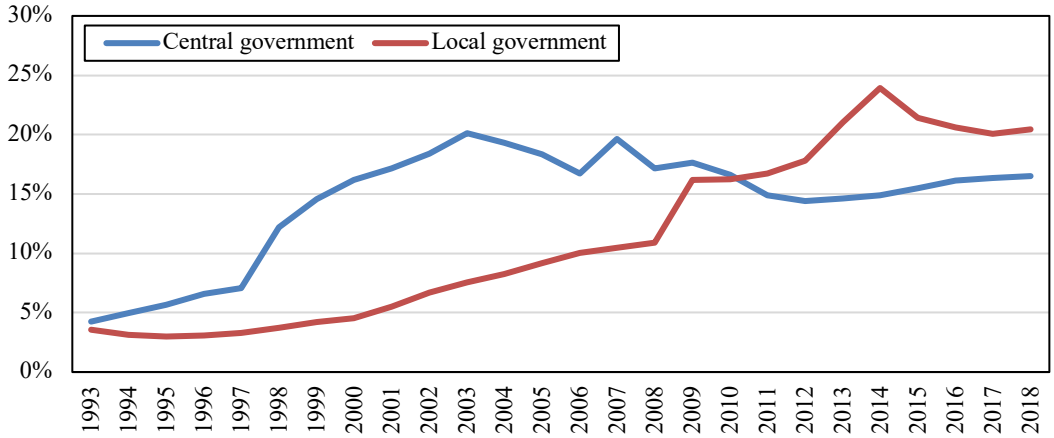
government debt changed its steady growth and begun to expand dramatically, with its size exceeding that in the central government right after 2008.

Figure 4.2: Government debt outstanding and growth rate: China, 1993-2018



Source: Published by CASS http://114.115.232.154:8080/ Note: the left scale is government debt outstanding and the right scale is annual growth rate (yoy). After 2000, local government debt grew at a rate (average 25%) much faster than central government debt (15%).

Figure 4.3: Government debt-to-GDP ratio: China, 1993-2018



Source: Published by CASS http://114.115.232.154:8080/ Note: Between 1997 and 2008, the central government grew rapidly while local government grew steadily; however, after 2008, this trend was reversed with local government debt reached a level higher than the central government.

The central government debt expanded rapidly from 1994 to 2007 under the influences of China's fiscal policy. In 1993, the Ministry of Finance was forbidden from borrowing from the PBC; and shortlyly after in 1995, local government was prohibited from issuing debt by the Budget Law. Hence, treasury bonds, as the main source of central government debt,

became the only way for the central government to finance the fiscal deficits (Zhu et al., 2018). It can be seen from **Figure 4.2** and **Figure 4.3** that the central government debt almost doubled between 1997 and 1998, due to the proactive fiscal policy implemented to lessen the impact of Asian Financial Crisis in 1997. Then, the central government debt expanded at a fast growth rate around 20% year to year, and its debt-to-GDP ratio reached a historically high level at 20% by 2003. After this round of fiscal expansion, the central government shifted its proactive fiscal policy to a prudent one, hence its debt growth rate and debt-to-GDP ratio were suppressed until the year 2007 when the economic bubbles happened.

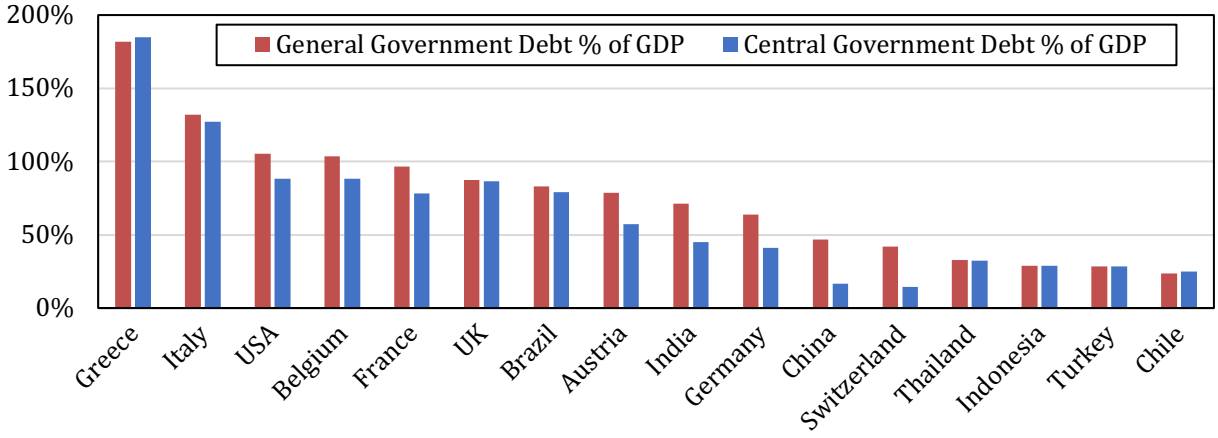
After 2008, the central government debt-to-GDP ratio maintained around 15%. Instead, the local government debt expanded dramatically as "4 trillion RMB stimulus plan" was primarily laid on local governments. These stimulus plans encouraged local governments to implement large-scale infrastructure projects and social welfare housing constructions, of which over 70% of funds came from local governments (see Appendix 1). At the same time, the central government relaxed the regulation on LGFVs and encouraged local governments to raise additional debts through them[59].

Based on **Figure 4.2** and **Figure 4.3**, the size of local government debt doubled in 2009, and the growth rate of government debt jumped to the historically highest level of 32%. By 2018, the size (18.4 trillion RMB in 2018) of local government debt was nearly five times of a decade ago (3.5 trillion RMB in 2008), and its debt-to-GDP ratio once peaked at 25%. These figures indicate that the stimulus plan is the primary driver of government debt expansion (Wu, 2015; Bai, Hsieh & Song, 2016; Chen, He & Liu, 2017).

The fast expansion of local government debt was suppressed in the year 2014 when numbers of restrictions applied to regulate local government debt (see discussion in 4.2.3). At the same time, many debts were due (see **Figure 4.1**), which directly leads to a zero increase in government debt in 2015. After that, the local government debt-to-GDP ratio was maintained at around 20%, and its growth rate slowed largely.

[59] The Ministry of Finance (MOF) issued a regulation that allowed local government to finance investment projects using funds borrowed by LGFVs (Document 631, Department of Construction, Ministry of Finance, October 12, 2009). The China Bank Regulation Committee (CBRC) also encouraged to increase lending to local government investment projects, including establishing more LGFVs compliant with regulations (Document No. 92, CBRC, March 18, 2009) (Chen, He & Liu).

Figure 4.4: General and central government debt-to-GDP ratio: Worldwide, 2017



Source: BIS https://stats.bis.org/ Note: China has a relatively low level of general government debt and unusually low level of central government debt compared to advanced economies.

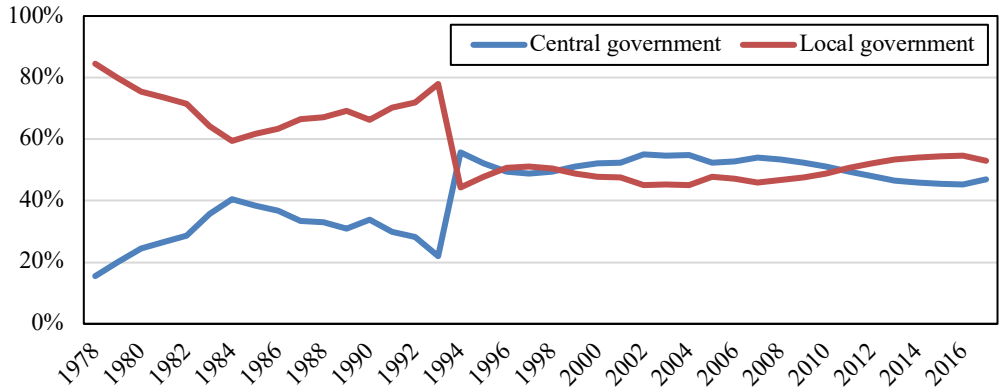
Though fast expansion, China's government debt level is still low in comparison to other countries. Based on BIS data on general government debt (see **Figure 4.4**), China ranks rather low among all listed countries, and its debt-to-GDP ratio is less than half of that in advanced economies. Furthermore, China has a relatively low level of central government debt but a high level of local government debt, which is a rare case around the world. Hence, in the next section, this master thesis will dig into the cause of relatively high local government debt.

4.2.2 Causes behind local government debt accumulation

The relatively high level of local government debt is rooted in the mismatch between its administrative responsibility and fiscal authority caused by fiscal decentralization. The "tax sharing reform" in 1994 modified the budget law and removed much authority of local governments over local tax revenues. Consequently, the fiscal revenue share of local governments fell from 80% to 50% (see **Figure 4.5**), while the expenditure share of local governments grew from 50% to 80% (see **Figure 4.6**). The decentralized fiscal system leads to that tax revenues flow upwards from local to central, while fiscal expenditures move downwards and burden on local governments (Gong, Wang & Jia, 2011; Shi, 2007).

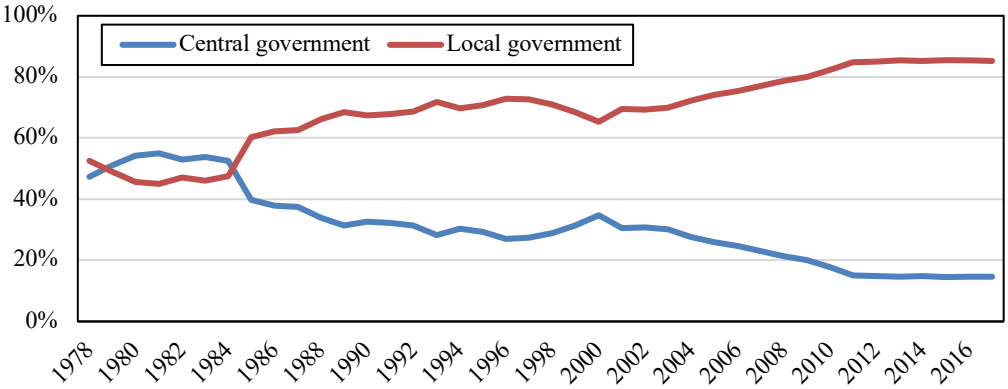
The central government also had budget surplus (5.1 trillion RMB surplus in 2017) while the local government had budget deficit (8 trillion RMB deficit in 2017) at most of time after 1994[60]; overall, the government runs deficit. One important use of central government surplus is the transfer payment to local governments (3.5 trillion RMB in 2017) as complements to local government revenues under fiscal transfer system. However, the amount of transfer payment is insufficient to cover the local government deficit and the allocation is not efficient (Zhong & Lu, 2015; Wu et al., 2017). Therefore, local governments tend to raise additional debts to fulfill their fiscal responsibilities on infrastructure investment and welfare housing construction.

Figure 4.5: Share of central and local government fiscal revenue: China, 1978-2018



Source: NBS http://data.stats.gov.cn/english/easyquery.htm?cn=C01 Note: in 1994, the fiscal revenue share of local governments fell from 80% to 50%, while the share of central governments increased from 50% to 80%.

Figure 4.6: Share of central and local government fiscal expenditure: China, 1978-2018



Source: NBS http://data.stats.gov.cn/english/easyquery.htm?cn=C01 Note: after 1984, the gap between local and central government expenditure share kept widening.

[60] See NBS - Finance: http://data.stats.gov.cn/english/easyquery.htm?cn=C01

Moreover, inter-jurisdictional competitions and soft budget constraints have also been considered as institutional drivers for local government debt accumulation. To gain promotions from fierce inter-jurisdictional competitions, local officers tend to raise debt and invest excessively on large-scale projects, with an aim to show off their political achievements (Shi, 2007; Tsui, 2011; Pan et al., 2017). At the same time, the budget constraints are "soft" as they allow central governments to bail out local governments when default (i.e., the central government will take the default risks at the end), hence no effective way exists to restrain the overinvestment and overborrowing of local governments (Shi, 2007; Gong et al., 2011; Miao, Xiang & Zhang, 2007). These institutional factors have led to aggressive borrowing and infrastructure investment behaviors in local.

4.2.3 Restrictions on LGFVs since 2014

After 2009, the number of LGFVs increased substantially and became the major financing vehicle for local governments' investments. Compared to local governments, LGFVs face fewer restrictions in issuing bonds or raising bank loans, hence can bridge local governments and creditors in financing the gap between fiscal expenditures and revenues of local governments. With local governments' implicit guarantees, LGFVs also have easier access to financial resources in comparison to other enterprises (Chen, He & Liu., 2017). However, the debt raised through LGFVs (e.g., MCBs through WMPs) is always hidden from both local governments' balance sheet and creditors' balance sheet, which will worsen the debt supervision transparency (Chen, He & Liu., 2017). Gao, Ru & Tang (2018) also provide evidence that LGFVs defaulted on their commercial bank loans before 2014.

To better regulate local government debt, especially these "hidden" one from LGFVs (e.g., MCBs), "Rule No.43" was introduced in October 2014 with new guidelines on the regulation and control of local government debt. The new guidelines standardized the process for local governments to raise debt and integrated local government debt management into the overall fiscal budgeting process.

In addition to "Rule No. 43", China's Budget Law was also modified in 2014. The new Budget Law gave bonds issuance authority back to local governments, conditional on the fact that the issuance must be within the fiscal budget and under the control of the central government. The new Budget Law also prohibited the central government from bailing out local government debt and local governments from providing guarantees to LGFVs or raising debt via LGFVs, which may relieve the influence of soft budget constraints and limit the shadow banking activities. At the same time, the central government requested local governments to restructure and substitute existing debt with Muni bonds[61], with the purpose to incorporate the current government debt into the supervision of the central government and the Ministry of Finance.

The new Budget Law combined with "Rule No.43" make local government debt management more standardized and transparent. However, the growth of local government debt only slowed in 2015 and then started to increase again. The reason is that the root cause of local government debt accumulation -- the fundamental mismatch between local governments' fiscal responsibility and financial power, remains unsolved. Suppressing debt issuance without supplying an alternative financing source could have adverse consequences for economic growth.

4.3 The influence of government debt on economic development

4.3.1 The relationship between government debt and economic growth

The theoretical discussion on the relationship between government debt and economic growth has been ongoing for centuries. Some studies hold views that government debt can promote economic growth, especially during recession periods. Keynes (1936) believe that using government debt to stimulate economic development would be a wise policy in a recession period. Lerner (1943) further points out in his "Functional Finance Theory" that the issuance

[61] The new regulation relaxed the restriction on local government bonds, allowed government to issue "New Bond" and "Replacement Bond" as Munibonds. New bond is newly issued local government bonds, Replacement Bond is to replace previous debt such as bank loan, BT to local government bond. They are under the supervision of central government.

of government debt would effectively guide the allocation of capital resources. Panizaa & Presbitero (2014) explained the logic behind this: persistent recession will influence industrial capital and investment negatively; expansionary fiscal policies such as raising debt for large-scale infrastructure investment can revive the economic development from recession. DeLong & Summers (2012) also argued that expansionary fiscal policy is a spontaneous financing behavior in a low-interest rate environment.

There are also many scholars who believe that government debt will harm economic development in the long run. Adam Smith (1776) believes that government debt would crowd out capital for production and thus weaken the national economy. David Ricardo (1820) agrees with Adam Smith's view but emphasized that issuing public debt has the same economic effect as increasing tax, which is called "Ricardian Equivalence Proposition." Many empirical studies also support that government debt harms economic growth. Saint-Paul (1992) and Aizenman et al. (2007) find a negative link between the government Debt-to-GDP ratio and the steady-state growth rate of GDP per capita.

A more popular view on the link between government debt and economic development is that there is a non-linear relationship with a tipping point, beyond which it hurts economic growth. Reinhart and Rogoff (2010) examined this relationship in 44 countries and conjectured that such a threshold exists: countries with government debt-to-GDP levels larger than 90% are associated with significantly lower GDP growth rate.

In the context of China, Lin & Gong (2008), Guo & Liao (2015) and Pan et al. (2017) examine the relationships between China's government debt and GDP and argue that it will harm the economic growth in the long run. Guo & Liao (2015) further point out that the crowd-out effect of government debt leads to the decrease of private consumption and investment, and therefore harm the long-run economic growth.

Wu (2014) confirmed the nonlinear relationship in China between economic growth and local government debt and suggested that the threshold of China's government debt-to-GDP ratio (40%) could be much lower than that in many OECD countries (90%). Chen et al. (2017)

assumed the nonlinear relationship and studied the optimal levels of government debt in China. The result showed that the optimal level of government debt-to-GDP ratio in China was 41% in 2014. Similarly, Sun (2018) identified the long-run sustainable debt level (26%) and the maximum sustainable debt level (93%) for China's government debt. He concluded that China's government debt is still sustainable in the near and medium term. However, why the threshold of China's government debt is lower than the that in advanced economies is still under research, which worth to dig more in the subsequent studies.

4.3.2 The promoting effect of China's government debt

China's government debt can facilitate economic development through investment in infrastructures. Wu (2015) and Ding (2016) indicate that Chinese governments use infrastructure investment as fiscal tools to stimulate the economy in the short run. Based on NAO reports, nearly 60% of funds flowed to infrastructure and transportation construction in 2013, which promoted the urbanization process and revived the local economy from the negative influence of GFC. Chen, R (2017) also confirms the positive effect of government debt on local economic development in China. He further complements that cities with better infrastructures are more easily to attract enterprises to build factories there, hence stimulating the industrial economy locally.

However, Xu, Cheng, and Zhuang (2016) point out that the promoting effects of government debt are different between regions. Developed regions like Beijing and Shanghai will experience stronger promoting effects, while underdeveloped areas like Xinjiang and Qinghai may face overinvestment problems. Ansar et al. (2016) further state that China's infrastructure investments have problems like cost overruns (averagely 30% higher than estimated and resource misallocation (e.g., with respect to the transportation system, some routes witness small traffic volumes while some are highly congested). They suggest that poorly managed infrastructure investments in China will weaken the promoting effect and cause problems like overinvestment and resource misallocation, which worth further

explorations on to what extent these problems have severally influenced China's economic development.

4.3.3 The crowd-out effect of China's government debt

Although government debt can crowd in incremental investments in the short term, they may also crowd out investment and consumption in both the short and long term. Zhang (2015) and Huang, Pagano & Panizza (2019) explain this crowd-out effect with interest channel: the increase of government debt will promote interest rate, which will cause the decrease of private investments and thus the economic growth rate.

Government debt can also crowd out private investment through the misallocation of credit resource. According to Bai et al. (2016), funding the stimulus plan via LGFVs induced a credit reallocation in favor of politically well-connected firms, probably with adverse effects on long-run productivity growth. Liang et al. (2017) and Huang, Pagano & Panizza (2019) test the impact of local government debt on firm leverage in China. They found that an expansion of local government debt significantly crowded out the leverage of non-SOEs, while crowded in that of SOEs. With the fast accumulation of government debt, the misallocation towards SOEs will exacerbate and hinder the development of the private sector. As the productivity in the private sector is generally more efficient than that in public sectors (Wu, Wu & Wang, 2018; Huang, Pagano & Panizza, 2019), this crowd-out effect would further reduce the productivity and long-run economic performance.

4.3.4 Linkage to the real-estate market

Since the tax sharing reform of 1994, local governments need to look for other sources of revenues. One prominent source is the land financing. China's local governments heavily rely on land sale revenues (or called land financing) to borrow money and repay debts. According

to the NAO reports[62], 38% of local governments claimed that they would use future land sales revenues to repay the debt.

Liu & Xiong (2018) explain this with a positive feedback loop: local governments create LGFVs and use land resources or future land sale revenues as collaterals to borrow money from banks; the land collaterals together with implicit government guarantee to LGFVs will mitigate concerns about local government default risk, leading to the excess credits to LGFVs; the excess credit will then bring high repayment pressure to local governments, in turn, they would like to sell more lands to repay debts, hence stimulating the land supply. Besides, government-led infrastructure constructions speed up the urbanization process, attracting people moving from rural area to urban area and enterprises coming to build factories. This brings a large number of housing demands, combined with the increasing land supply, significantly promotes the development of the real-estate market in China.

Land financing makes local governments, real-estate enterprises, and banks a community with shared interests. Zhang & Barnett (2014), Ambrose et al. (2015) and Tian (2018) explain the linkage as follows: local governments purchase land from farmers and urban residents at a low price and then resale or lease properties to so-called "developers" at a high price; developers obtain lands and use them as collaterals to borrow funds for buildings construction, and then sell these buildings to households at a higher price.

Under the circumstance that house prices keep going up, banks benefit from steady interest revenue, developers benefit from profits from house selling, house buyers benefit from the appreciation of house prices, and local governments obtain huge land transfer revenue, which is an all-win situation. Nevertheless, this is all based on a healthy and continuously growing real-estate market. Once the demand for houses shrinks, a chain of adverse reactions will happen, followed by a debt-deflation cycle (Ambrose et al., 2015).

To sum up, land financing building a positive feedback loop between local government debt expansion and real-estate market development. Given that bubbles might exist in China's real

[62] See: the National Audit Office Announcement No. 32 (2013) http://www.audit.gov.cn/n5/n25/c63566/content.html;

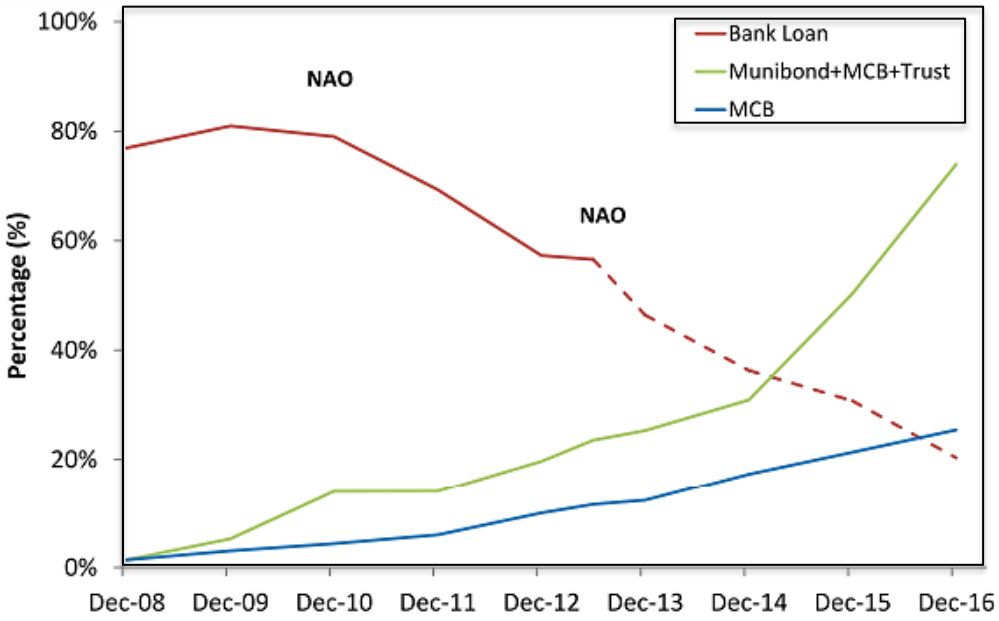
estate market, a further look at how much real-estate growth is driven by land financing and how much is driven by real demands can help to evaluate risks in the real-estate market.

4.4 Issues and risks associated with government debt

4.4.1 Increasing shadow bank activities

As presented in **Figure 4.1**, China's local government debt is primarily financed through bank loans, BT, Municipal Corporate Bonds (MCBs), and trust loans. Besides the fast accumulation of local governments, a noticeable composition shift from bank loans to non-bank debt can be observed as well, indicating the increase of shadow bank activities. Based on **Figure 4.7**, the composition of bank loans declined from 80% in 2008 to 60% in 2013, and a further decline to 20% was expected. On the other hand, the percentage of MCBs rose from nearly 0% in 2008 to 20% in 2016 while the total of MCBs, muni bonds, and trust loans increased from 0% to around 80%[63].

Figure 4.7: The shift of local government debt composition: China, 2008-2016



[63] The data and figures below are from Chen, Z., He, Z., & Liu, C. (2017). The Financing of Local Government in China: Stimulus Loan Wanes and Shadow Banking Waxes.

Source: figure from Chen, He & Liu. (2017). Note: the figure shows that the composition of non-bank local government debt has increased substantially.

As discussed, local governments prefer to borrow through LGFVs by issuing MCBs or raising loans, for financing their expansionary infrastructure investment demand and rolling over matured bank loans. Based on estimation from Chen, He & Liu (2017), nearly 60% of MCBs are purchased by Wealth Management Products (WMPs)[64], and this percentage is still increasing. They also find that provinces burdened with more stimulus package have experienced more entrusted loan growth. Given that WMPs, entrust and trust loans are primary components of the shadow banking sector, the increase of shadow banking activities led by local government debt expansion is self-evident.

As discussed, the increasing shadow banking activities are sources of financial instability in consideration of their risky financial products and interconnectedness with the traditional banking sector (see 3.3.3). Hereby, regulations on LGFVs financing is necessary to limit shadow banking activities. Situations have been improved with "Rule No. 43" and new Budge Law, which directly led to the zero increase of government debt in 2015. Further efforts still need to make to expand formal banking financing channels and introduce private capital. This will help to reduce the government's rely on shadow banking activity and even debt-financing.

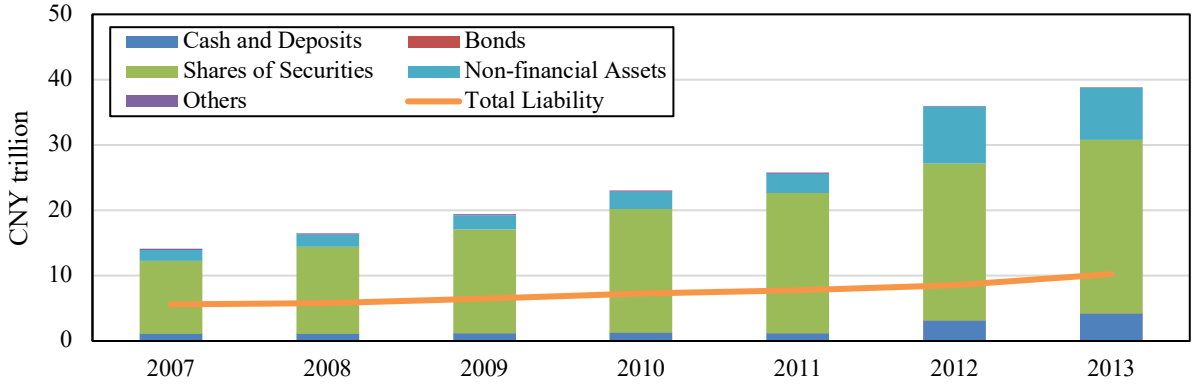
4.4.2 Systemic risks of government debt

In China, the influence of government debt on the banking system can be significant as banks hold 60% of government debt and sometimes need to take government default risks due to soft budget constraints (Reinhart & Rogoff, 2010; Chen, 2017). Since 2008, China's government debt has increased over 400%, which may lead to debt crises and potential risks in the banking system (Hou et al., 2012; Fan & Lv, 2012; Li, 2012).

[64] A wealth management product is an uninsured financial product sold in China by banks and other financial institutions. Typically, they offer a high rate of interest, and, sometimes, guaranteed return.

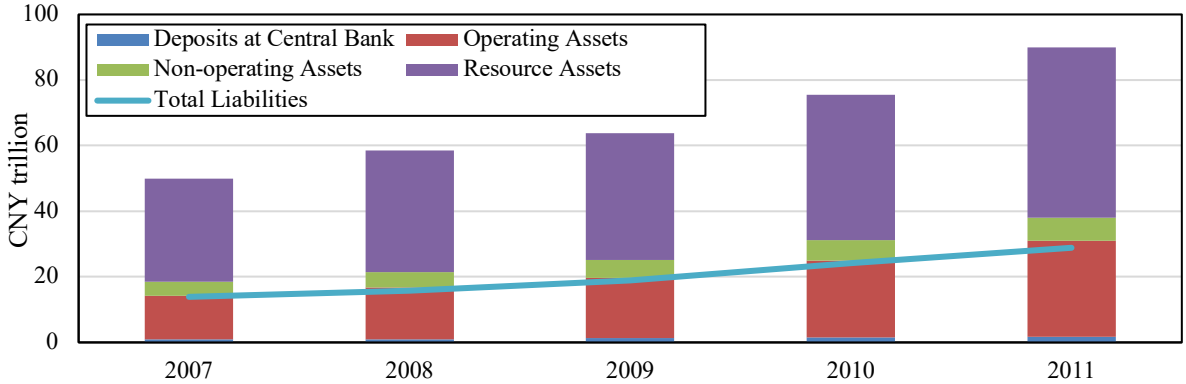
Based on **Figure 4.8** and **Figure 4.9**, liabilities in the central government only comprise one-third of its financial asset, while in the local government balance sheet, the percentage of liabilities to their liquid assets[65] was almost 100%. This implies that the central government still has space to leverage up while local governments may have repayment pressure as their liabilities are just covered by their liquid assets.

Figure 4.8: Central government assets and liabilities: China, 2007-2013



Source: CASS http://www.nifd.cn/writings/details/1080 Note: Total assets are composed by financial assets like cash, bonds, securities, as well as non-financial assets and others.

Figure 4.9: Local government assets and liabilities: China, 2007-2011



Source: CASS http://www.nifd.cn/writings/details/1080. Note: Total assets are composed by assets for short-term purposes like cash, deposits, and operating assets as well as assets for long-term purposes such as non-operating assets and resource assets.

Chen (2017) further states that local government debt is contributing to a higher non-performing loan ratio in the commercial banking system. Gao, Ru & Tang (2018) also provide direct evidence that LGFVs defaulted on their bank loans with a default rate of 1.7%

[65] Liquid asset refer to an asset that can be converted into cash in a short time, with little or no loss in value.

before 2014[66]. The situation tends to be worse after 2014, as the "Rule No.43" prevents LGFVs from implicit government guarantees and land collaterals.

The central government is taking measures to restructure local government debt. The new Budget Law allows local governments to replace their short-term, high-interest-rate bonds with long-term, low-interest rate bonds, which can help to save local governments' interest costs and avoid default risks.

4.5 Summary

Government debt, as a complement to fiscal revenue for fiscal policy implementation, can drive economic growth directly through financing infrastructure investments. Compared to other countries, China's government debt-to-GDP ratio is relatively low, but the share of local government debt is high, showing a different debt structure in the government sector. Both fiscal and institutional factors drove this government debt expansion in China:

- The decentralized fiscal system started from "tax sharing reform" in 1994 is the essential cause of this different debt structure. This reform leads to that tax revenues flow upwards from local to central while fiscal responsibilities move downwards from central to local, forcing local governments to raise debts to finance these fiscal burdens.

- Inter-jurisdictional competitions and soft budget constraints also promote aggressive borrowings and investments among local governments. After 2008, as most stimulus packages were burdened on local governments and their borrowing constraints have been relaxed, the local government debt began to expand sharply.

Empirical results show that government debt still has a positive effect on China's economic growth, while problems like regional imbalanced (e.g., overinvestment in the underdeveloped

[66] The default rate for all rated corporate entities in Greater China was 0.19% in 2017, see https://www.spglobal.com/_assets/documents/corporate/spglobalratings_defaulttransitionandrecovery2017annualgreaterchinacorporatedefaultstudyandratingtransitions_aug-20-2018.pdf

regions) and resource misallocation (e.g., the transportation system) are appearing. The crowd-out effect (crowd out the leverage of non-SOEs while crowding in SOEs) of local governments will further damage the productivity and long-run economic performance.

Local government debt also promotes the development of the real-estate market through the land financing channel. Chinese local governments rely heavily on land sales revenues to borrow money and repay debts, which boost the land supply; combined with rising housing demands resulting from fast urbanization, the real-estate market began to boom.

Moreover, local government debt also stimulates shadow bank activities with increasing financings through MCBs (issued by LGFVs and primarily bought by WMPs) and trust loans. Debt financing through LGFVs has a high default rate and contribute to the higher non-performing loan ratio in the commercial banking system. These all raise concerns about financial instability and call for regulations on government debt financing.

- Firstly, it is essential that China should prioritize to improve financial and fiscal transparency. Fiscal transparency is the basis for the central government to formulate and implement macro policies. Compared to other countries, China has made little public information on its government debt size, composition, and budget, limiting the empirical researches on this topic. This situation had been improved with “Rule No. 43” and new Budge Law for limiting “hidden” debts from LGFVs, further efforts still need to be made for the fiscal transparency, with more information provided for the analysis of government balance sheet and debt management.

- Secondly, expanding financing channels and introducing private capital can be an effective way to reduce the government’s dependency on fiscal revenue and debt-financing. Local governments raise debts with the intention to finance local development such as infrastructure construction and welfare system, for which the investment expenditure cannot be fully covered by fiscal revenue. Therefore, alternative financing channels become necessary to ease the financing pressure of local governments. For some infrastructure construction projects, Built and transfer (BT) and Public-Private Partnership

(PPP) should be promoted to introduce private capital into the local construction and development. Mutually benefits could be expected from these measures as it will make private capital benefit from regional economic growth, and at the same time bring social resources to infrastructure investment.

- Lastly but most importantly, in-depth reforms of the decentralized fiscal system are necessary for the long run. A well-established fiscal system will enable local governments to balance their budgetary revenues and burdens better. A fiscal transformation from economic growth-oriented to public service-oriented government is essential to limit the excess investments of local governments in pursuing economic development. To achieve this, the central government should allow each level of government to establish their fiscal targets and have more fiscal discretional power. At the same time, the central government could also increase the size and proportion of transfer payment to local governments, and therefore enhance the ability and efficiency of local governments to provide public products and services.

5 Non-financial corporate debt

Non-financial corporate debt accounts for 61% of non-financial debt in China in 2018, which is much higher than the average level in other economies. The root causes for the high debt level are associated with structural, institutional and cyclical factors, causing a series of problems like overcapacity, zombie firm and structural imbalance. To understand these problems, this section will bring you both macro and micro perspectives to discuss the drivers behind this credit expansion and misallocation in China, as well as related issues and risks in the non-financial corporate sector.

5.1 Introduction to China's non-financial corporate debt

5.1.1 Definition and characteristics of non-financial corporate Debt

Non-financial corporate debt[67] refers to the debt raised by non-financial corporations to finance the ongoing operations, M&A, or to expand the businesses. The financing tools include short-term tools like commercial papers (CP) and middle term note (MTN) as well as long-term instruments like corporate bonds and bank loans. The backing for corporate debt is usually the payment ability of the corporation, which is typically the money to be earned in the future or physical assets as collateral.

5.1.2 Data sources

Our data comes from various sources, including the Chinese Academy of Social Science, National Bureau of Statistics (NBS), Bank for International Settlement (BIS), State-owned Assets Supervision and Administrate (SASA). Please find reference details in **Appendix 2: Data sources.**

[67] In this section, we only discussion the non-financial corporate debt. Instead of saying "non-financial corporate debt" repeatedly, we will use "corporate debt" in the later contents.

China's non-financial corporate debt data is relatively transparent. Both BIS and CASS publish the size and debt-to-GDP ratio of non-financial corporate debt. The two statistics are a bit different due to different treatments and calculations of debt form LGFVs, and this master thesis only use BIS data for comparisons between countries. Non-financial corporate data can be decomposed by its financing sources, including bank loans, corporate bonds and others, which can get from JP Morgen reports (see URL source in Appendix 2). It can also be decomposed by industry or ownership type, but the decomposed debt data is not directly available and needed to be estimated by using proxies like debt-to-asset ratio (liabilities/assets).

To calculate the average corporate leverage ratio by ownership (SOEs and non-SOEs), this master thesis uses balance sheet data among these two types of enterprises. CASS publishes total assets and liabilities data of non-financial enterprises while SASA published that of SOEs, and the non-SOEs data can be then calculated by total minus that in SOEs. The average SOEs and non-SOEs leverage ratio can be calculated by liabilities/assets. Indicators (e.g., profit margin, debt-to-asset ratio, interest coverage ratio, utilization rate, etc.) of industrial enterprises are published by NBS, with breakdowns into different companies and industries.

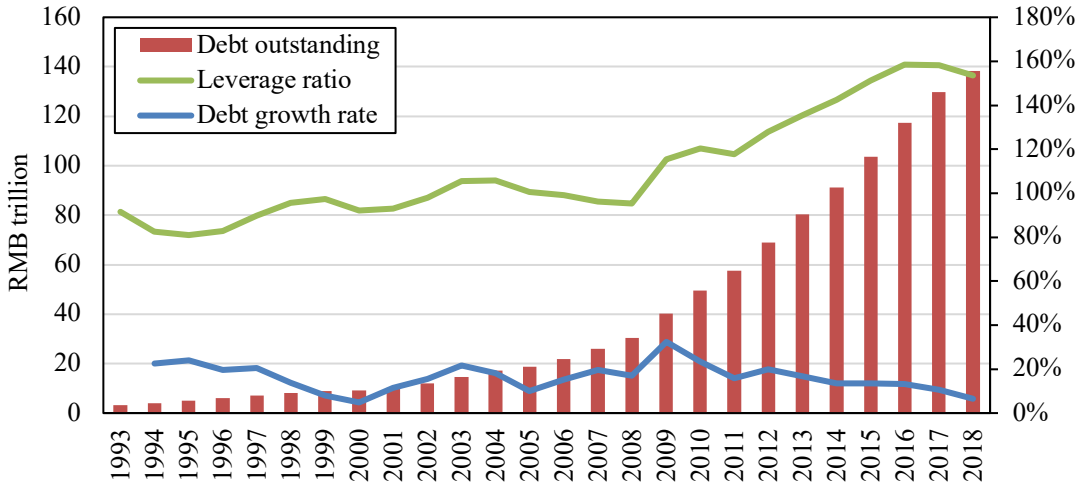
The industrial leverage ratio calculation can vary, it can be estimated by aggregating the balance sheet data of listing companies (Zhou et al., 2017; Ivan and Zurawski, 2017; Lam and Chivakul, 2015; Zhang et al., 2015) or use proxies like industrial debt-to-asset ratio. This thesis uses Ivan and Zurawski (2017)'s estimation on the average leverage ratio in selected industries (see **Figure 5.5**), which is aggregated from listing companies balance sheet data in CSMAR and Wind database. Additionally, SOEs' liabilities data by industry can be used as a proxy to calculate the composition of corporate debt by industry. However, all these estimation or proxy may produce biased results, as it only uses the information from listing companies or SOEs and not cover the full set of companies in the industry.

5.2 Credit expansion and misallocation in the corporate sector

5.2.1 Credit expansion and causes behind

China's corporate debt has experienced an exponential increase over the last decade, with its size growing from 30.4 trillion RMB (4.4 trillion USD) in 2008 to 138.2 trillion RMB (20.4 trillion USD) in 2018. The most critical turning point was is year 2009, when debt growth rate peaked at 35% because of the "4 trillion RMB stimulus plan". After that, corporate debt grew at a rate (averagely 18%) faster than GDP growth rate (averagely 8.1%), and its debt-to-GDP ratio increased rapidly from 95% in 2008 to 154% in 2018.

Figure 5.1: The size, growth rate and leverage ratio of corporate debt: China, 1993-2018



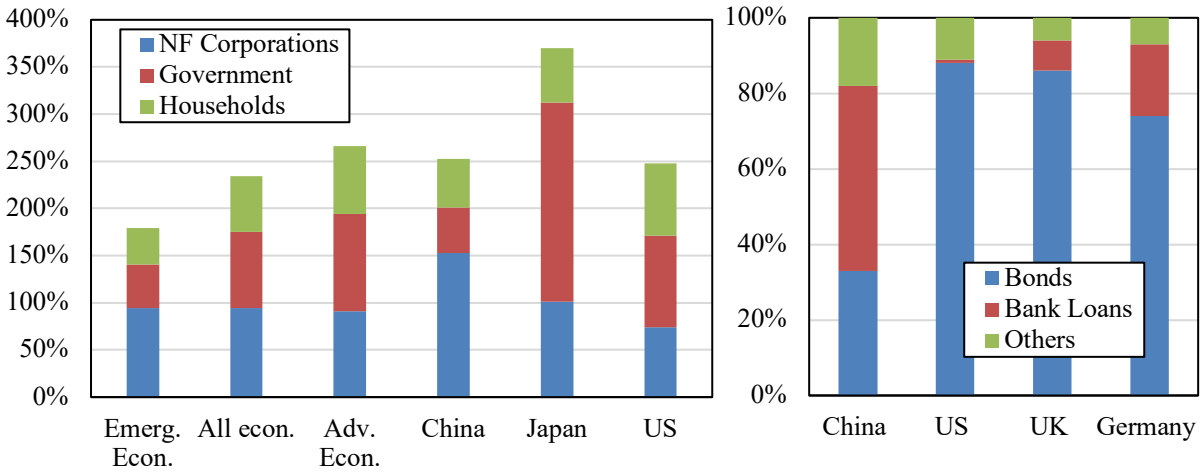
Source: CASS http://114.115.232.154:8080/ Note: The left scale is corporate debt outstanding size; the right scale is for corporate debt leverage ratio (debt-to-GDP) and annual debt outstanding growth rate. Corporate debt grew at a rate faster than GDP growth rate after 2008, hence its debt-to-GDP ratio increased rapidly from 95% in 2008 to 154% in 2018.

Compared to other countries, the share of corporate debt in total non-financial debt in China is one of the highest among all economies, standing for 61% of total non-financial debt in 2018. The non-financial corporate debt-to-GDP ratio is high as well, comprising 154% of total GDP and raking 6th among all economies[68]. The composition of China's corporate debt is also different from other countries. In China, enterprises prefer bank loans rather than corporate bonds. The composition of bonds in China's corporate debt is less than one third, while this

[68] Based on figure from BIS database: https://stats.bis.org/

figure is 75% in Germany and 90% in the UK and the USA (see **Figure 5.2**). Besides, most of the Chinese firms have short-term debts (mature in 1-2 years), while in the USA, the average debt term is around 9 years. This would raise long-term concerns of liquidity and refinancing risks as firms with more short-term debt need to access the debt markets more frequently[69].

Figure 5.2: Comparison of China's corporate debt with other economies



Source: BIS (left), JP Morgen report (right) (see Appendix 2) Note: The left figure is a comparison of the non-financial debt-to-GDP ratio by sector with other economies in 2018, both the absolute debt-to-GDP ratio or relative share of China's corporate debt is higher than that in other economies. The right figure is the average debt composition of listing firms in selected countries in 2015, China has a relatively low share of corporate bonds financing but a high share of bank loans.

The high debt level in China's corporate sector is caused by instructional factors. Firstly, some part of government debt transferred to the corporate sector because of policy burdens on SOEs. With close connections to central or local governments, SOEs undertake policy burdens or government functions and act as fiscal policy tools to stimulate economic development (Lin & Li, 2008). The 2009 stimulus package was primarily funded through SOEs and LGFVs, which directly promoted the sharp rise of corporate debt (Chivakul & Lam, 2015; Zhang et al., 2015; Yu & Lu, 2016).

Secondly, Huang and Li (2018) state that the fast development of enterprises and limited access to equity financing also lead to the expansion of corporate debt. Poonpatpibul et al.

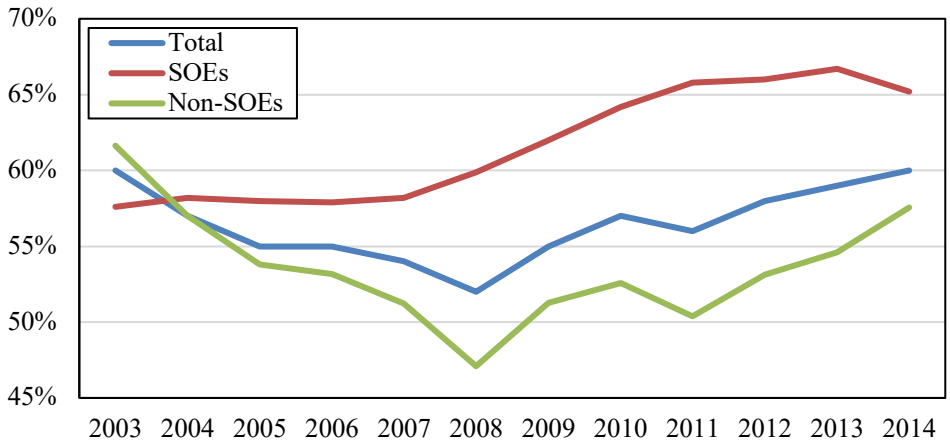
[69] JP Morgen, 2016. A Primer on the Financial Policies of Chinese Firms. [Online]. Available at https://www.jpmorgan.com/cm/BlobServer/A_Primer_on_the_Financial_Policies_of_Chinese_Firms.pdf?blobkey=id&blobwhere=1320725865930&blobheader=application/pdf&blobheadername1=Cache-Control&blobheadervalue1=private&blobcol=urldata&blobtable=MungoBlobs (retrieved on April 30, 2019)

(2017) explain that channels to mobilize China's high household savings to firm's equity financing (usually PE and VC companies) are still underdeveloped for equity compared to debt (deposits to loans). Besides, corporate equity financing channels are severely restricted by the stock market crash after the GFC (Lv & Bai, 2018). Therefore, corporates have relied heavily on debt financing, leading to the fast expansion of corporate debt.

5.2.2 Credit resource skewed to SOEs

Chinese corporations can be roughly divided into two categories: state-owned enterprises (SOEs) and private non-state-owned enterprises (non-SOEs). Non-SOEs have been playing an increasingly important role after the open-up reform in 1978, while SOEs remained major players in the Chinese economy and accounted for a big part of China's productive capitals and investments in the non-financial corporate sector (Zhu et al., 2018).

Figure 5.3: Average corporate leverage ratio by ownership: China, 2003-2014[70]



Source: CASS published the balance sheet data of non-financial enterprises, while SASA published that of SOEs, the non-SOEs balance sheet data can be hence calculated by total minus SOEs (see Appendix 2). Note: leverage ratio is debt-to-asset ratio, can be calculated by liabilities/assets. SOEs have averagely higher leverage ratio compared to non-SOEs.

SOEs have accumulated a high level of debt over the past decades, implying the skewness of credit resources to SOEs (see **Figure 5.3**). Before 2008, the leverage ratio in non-SOEs decreased a lot while SOEs maintained at 58%; after 2008, the leverage ratios of SOEs and

[70] The leverage ratio here and in later contents is calculated by debt/assets. In China, it is also called as asset-liability ratio.

non-SOEs both showed upward trends. Overall, SOEs (averagely 62%) have much higher leverage ratios than non-SOEs (averagely 54%).

Several studies confirm the credit misallocation among firms. Chivakul and Lam (2015) find that highly leveraged firms are mainly SOEs, with financing cost 20 basis point lower than non-SOEs. Zhang et al. (2015) identify similar patterns that SOEs have increased leverage, while private enterprises have deleveraged in recent years. They further argue that the implicit government supports mainly drive the low cost of financing. Ivans and Zurawski (2016) confirm previous findings and give another argument that the credit policies under "4 trillion RMB stimulus plan" are also thought to have favored SOEs.

Both structural and institutional factors influenced the leverage ratio in non-financial enterprises. Lu, Thangavelu & Hu (2005), Zhang et al. (2015) and Qian & Fu (2017) conduct a detailed analysis of the drivers behind highly-leveraged SOEs, which could be summarized as political connections, soft budget constraints, implicit government guarantee, and SOEs' advantages in size.

Firstly, with policy burdens on them, SOEs have strong incentives to borrow. The targets of SOEs are not only to maximize profits but also to realize social welfare gains, such as providing employment and protecting national enterprises. In return, the government allocates more credit resources to the SOEs. Secondly, there are soft budget constraints between banks and SOEs. Large banks are also primarily state-owned, sharing similar political burdens with SOEs. As a result, banks have skewed towards SOEs in terms of extending loans out of consideration for policy priorities or implicit government guarantees. Zhang et al. (2015) further suggest that if SOEs had borrowed on a market-driven basis and paid the same funding costs as their private counterparts, they would have borrowed much less. Lastly, compared to private enterprises, SOEs have natural advantages in size, collateral, reputation and implicit government guarantee, which enable them to attract more credit resource.

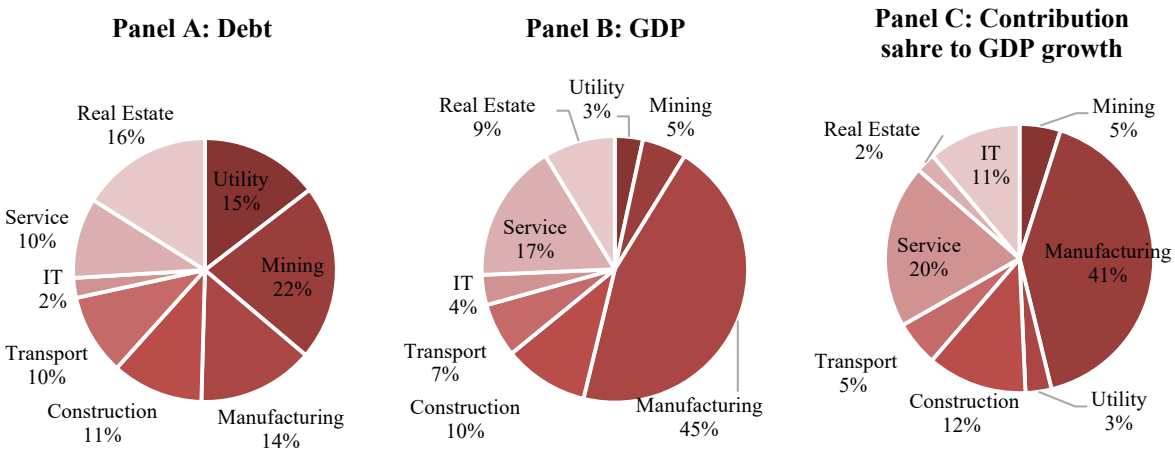
The bank credit skewness towards SOEs forces private enterprises to borrow from the shadow banking sector. Tsai (2015) conducts research on recent shadow banking activities in China

and conclude that private enterprises, especially small-to-medium enterprises (SMEs), relied heavily on shadow banking financing in a self-regulating manner. Ehlers et al. (2018) further point out shadow banking credit to China's private enterprises mainly takes the forms of trust loans and entrusted loans.

5.2.3 High leverage ratio in infrastructure-related industries

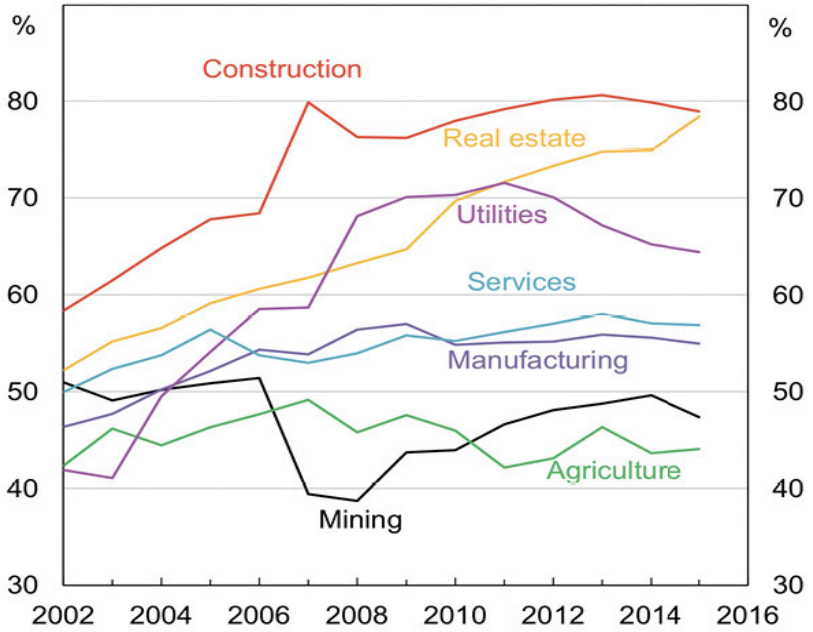
In China, the credit allocation among industries is imbalanced, with real-estate related industries having more credit resource. It can be seen from **Figure 5.4** that real estate, transport, mining, and utilities sectors occupy substantial credit resources (63% of total), but only contribute to 24% of total GDP and 15% of GDP growth. Instead, manufacturing, IT and service industries occupy 26% of credit resource but contribute to 66% of GDP and 72% of GDP growth. Furthermore, as shown in **Figure 5.5**, the leverage ratio in construction, real estate, and utilities industries experienced a substantial increase over the last decades, while that in manufacturing and service industries nearly maintained at the original level. Among all sectors, construction, real estate, and utilities are heavily indebted, with the leverage ratio standing at around 70%. It can be concluded that credit efficiency in real estate, utilities, mining and transport is relatively low when compared to manufacturing, service and IT industries, and credit misallocation problems exist among these industries.

Figure 5.4: Debt and GDP distribution by industry: China, 2014



Source: Debt (use SOEs' liabilities data as proxy) by industry data is published by SASA, GDP and contribution share to GDP growth by industry data is published NBS (see Appendix 2). Note: the composition is divided by the total of reported industries. Mining, real-estate, utility and transport industries occupy nearly 63% of credit resource in these industries but only contribute to 24% of GDP and 15% of GDP growth. Instead, manufacturing, IT and service industries occupy 26% of credit resource but contribute to 66% of GDP and 72% of GDP growth.[71]

Figure 5.5: Leverage ratio of non-financial listing companies by industry



Source: Ivan & Zurawski (2017). Note: Ivan & Zurawski (2017) estimate the average leverage ratio of listed companies in these industries using data from CSMAR and Wind database (not directly available through online resources). The construction, real estate and utilizes are heavily indebted.

Many studies examine credit misallocation and structural imbalance in China. Lam & Chivakul (2015), Ivan & Zurawski (2016) and Poonpatpibul et al. (2017) argue that real estate and construction sectors see a significant rise of corporate leverage ratio using listed companies' leverage data. Zhang et al. (2015) further point out that traditional industries (real estate, construction, utilities) are experiencing an increase in leverage level while emerging industries (IT, telecom) see deleveraging trends. Tian (2018) has similar conclusions that the leverage ratio in cyclical industries (steel, coal, real-estate) has increased significantly, while in some light industries such as textile production, averagely they experienced a 15% decrease in the leverage ratio over the last decade.

[71] In this figure, service industry includes whole sales, retailing, hotels and catering. Mining, utility and manufacturing make up industry sector.

One driving forces behind the imbalanced credit allocations among industries is the "4 trillion RMB stimulus plan". The Chinese government spent extensively on major infrastructures under this stimulus package, such as high-speed transportation and electricity (37% of the total spending), low-rent housing development (10%) and rural areas' infrastructure including road, gas and clean water facilities (10%), etc. This stimulus package promoted the housing, transportation system and utility system construction, and directly led to the low credit efficiency and over-indebtedness in these infrastructure-related industries (real-estate, utilities, transport, and construction).

Another influencing factor is urbanization. Based on data from the Ministry of Housing and Urban-Rural Development of the People's Republic of China (MOHURD)[72], 300 million people have been moving from rural to urban areas in the past 30 years, incurring significant demand and associated investments for infrastructure construction and real estate development. Therefore, real estate developers, construction companies, utilities, and transportation companies are borrowing extensively to finance their infrastructure investments. Additionally, these industries are also dominated by SOEs (especially transportation, utilities, and mining) (Fan & Hope, 2012). With low financing cost and soft budget constraints, it further promotes the increase of leverage level in these industries.

5.3 Issues associated with China's corporate credit misallocation

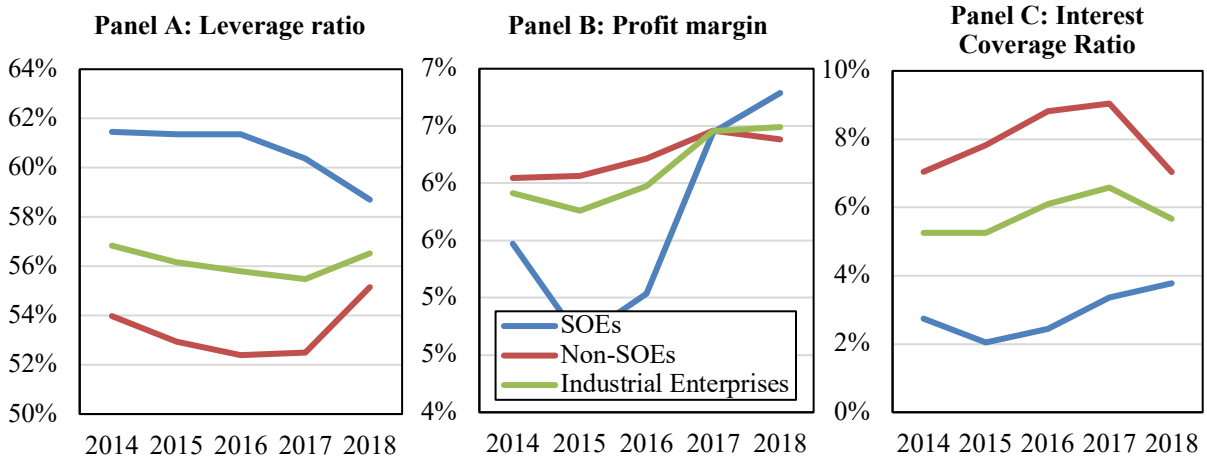
5.3.1 Low credit efficiency in zombie companies and SOEs

"Zombies" are companies that have losses over three consecutive years, they cannot meet environmental and technological standards, do not align with national industrial policies, and rely heavily on government or bank support to survive. Based on the research results from Lam et al. (2017), nearly half of the zombie firms' debt is related to SOEs. With implicit government guarantee and soft budget constraints, these firms can survive despite persistent losses and hence have the intention to invest excessively. They further state that the excess

[72] See: http://mirror.unhabitat.org/pmss/getElectronicVersion.aspx?nr=3288&alt=1

investments will raise corporate leverage ratio while weakening the profitability and debt service capacity within SOEs. It can be seen from **Figure 5.6** that SOEs have averagely higher leverage level but lower profitability and repayment ability than non-SOEs.

Figure 5.6: Comparison of main indicators between industrial SOEs and Non-SOEs



Source: All data from NBS (indicators of industrial enterprises) http://data.stats.gov.cn/english/easyquery.htm?cn=C01 Note: the enterprises used are enterprises in the industry sector (mining, manufacturing, utilities). Leverage ratio is calculated by liabilities/assets; the profit margin is calculated by profits/main business income; interest coverage ratio is operating profits/interest expenses. SOEs have averagely higher leverage ratio but lower profitability and interest repayment ability.

Studies find that zombie firms tend to crowd out private investment, hinder competition, and lower GDP growth in China (Tan, Huang & Woo, 2016; Guo, Jia & Li, 2017). For example, Tan et al. (2016) find that zombie firms tend to crowd out non-zombie firms' investment by 2–8%. As a result, they may drag overall GDP growth by 2.1% and employment growth rate by 0.8. Lam et al. (2017) also have similar conclusions that resolving zombie firm issues can generate significant gains of 0.7% - 1.2% additional GDP growth in the long-term.

5.3.2 Industry-wide overcapacity

The credit misallocation will influence corporate capacity utilization. Qian and Fu (2017) conduct an empirical analysis on this relationship and conclude that credit misallocation stimulates the enterprise's capacity expansion, reduces the capacity utilization rate, and increases the probability of overcapacity. Based on Xu and Jin (2017)'s study, coal, steel,

cement, aluminum, ship-building, and plate glass are overcapacity industries that recognized in the State Councils' related documents after 2008. Zhang et al. (2015) confirm that the overcapacity industries have widespread high leverage ratio, giving evidences that among overcapacity industries: ship-building (debt-to-asset ratio of 0.70), coal-chemical (0.69), and aluminum (0.68) have had the highest leverage ratio, followed by photovoltaic (0.67), steel (0.66), and cement (0.57) industries.

Qian & Fu (2017) and Zhang et al. (2015) further point out that most of the industries with overcapacity problems are dominated by SOEs. Implicit government guarantees and soft budget constraints will externalize the expansion risk in these industries, causing distortion in capacity investment. Even worse, enterprises can pledge the newly increased capacity to refinance their capacity investment, accelerating the overcapacity problem under credit stimulus (Qian & Fu, 2017).

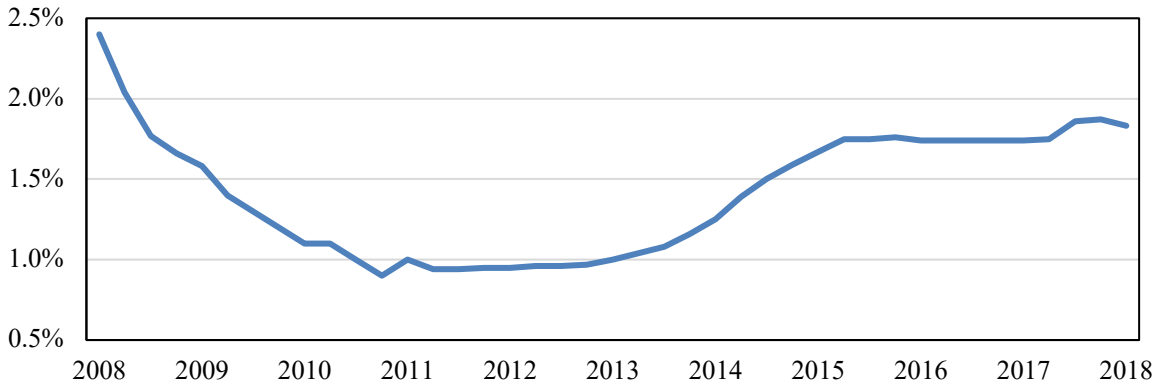
Overcapacity may hinder economic growth as it lowers the productivity of capital (Ivan and Zurawski, 2017). Besides the waste of capacity, overcapacity can have a prolonged influence on economic development. Firstly, overcapacity means the decline of the expected return of capital investment as companies cannot earn as much money as at full capacity. The unused capacity will also hinder the new investments, resulting in the decline of investment growth. Lastly, overcapacity leads to a supply surplus, which may influence the product price as well as international trade.

5.3.3 Risks to financial stability

The high debt level in the corporate sector will influence both the business performance within companies and the financial stability in the financial system. Gu, Cui & Hu (2016) and Huang & Li (2018) have studies this relationship between corporate debt and bank risk from both micro and macro perspectives:

From the micro perspective, the high leverage means repayment pressure and high funding cost. With lower economic growth rate and large-scale structural reforms in China, corporate profitability cannot avoid a decline. For companies which borrow excessively through debt financing, they will face high repayment pressure to pay interests with their earnings, and easily been trapped in the cash flow crisis. Furthermore, out of a consideration of repayment ability and default probability, banks tend to decline the loans to these highly indebted enterprises, pushing these enterprises to borrow from other financial institutions (e.g., the shadow banking sector) with a higher interest rate. The high funding cost incurred by high leverage ratio will pose additional credit and financial risk within companies.

Figure 5.7: Non-performing loans ratio in commercial banks



Source: Published by PBC, can be retrieved from CEIC https://www.ceicdata.com/en/indicator/china/non-performing-loans-ratio Note: The NPL ratio has nearly doubled between 2011 and 2018.

From the macro perspective, the decrease of enterprise repayment ability lead to the increasing non-performing debt ratio in commercial banks (see **Figure 5.7**), indicating the worsening asset quality of banks. Besides, corporate debt has contributed to nearly half of non-financial credit growth after 2008 (see **Figure 3.5**). The enormous debt size leads to the increase of interbank borrowing, and thus, the leverage ratio in the financial sector (Gu, Cui & Hu, 2016). Through these financial transmission mechanisms, the high leverage ratio in non-financial enterprises will finally influence financial stability.

5.4 Summary

China's non-financial corporate debt has expanded sharply with its current debt-to-GDP ratio (154%) ranking 6th around the world and its composition in total debt (61%) among one of the highest. The high corporate debt level in China was mainly driven by the massive policy burdens on SOEs and limited access to equity financing. After 2008, the situation worsened as stimulus package burdened on SOEs and equity market shocked by GFC.

The corporate credit allocations in China are imbalanced among firms and industries, causing problems like zombie firms and overcapacity.

- In terms of ownership type, credit resources are more skewed to SOEs due to their implicit government guarantees and soft budget constraints. Therefore, SOEs tend to invest and expand excessively, raising concerns of zombie firms and overcapacity in SOEs dominated industries.

- Among industries, the leverages in infrastructure related industries (e.g., real estate, construction, utilities, and transportation) has risen significantly, resulting from the stimulus package in 2009 and fast urbanization. Accordingly, capacities in related industries (e.g., steal, cement, coal) have overextended, leading to the industry-wide profitability decline and capital productivity reduction.

Zombie firms tend to crowd out private investments and hinder competitions within industries, while overcapacities can cause industry-wide reduction of profitability and capital productivity, which all damage the economic growth in the long run. Furthermore, the high debt level will cause repayment pressure and restricted investment within companies and worsening asset quality in banks. Therefore, policies are needed to limit corporate debt expansion and improve credit allocation efficiency.

- Policies should be made to extend the maturity profile of corporate debt. In China, the percentage of short-term debt-financing is higher than other advanced economies like the U.S and the U.K, this would raise long-term concerns of liquidity and refinancing risks as firms with more short-term debt need to access the debt markets more frequently.

- Policies should be also made to promote equity financing (equity as debt with infinite maturity) to complement debt financing, as limited access to equity financing has driven the high corporate debt level in China. The advantages of equity financing include steady financing source, enhance the repayment ability of enterprises, reduce the reliance on bank loans, and therefore improve the corporate market value (Xue, 2007).

- Developing corporate bonds is necessary. Bonds are "public creditors" and can provide public supervision to firms, hence helping firms to increase self-discipline, improve corporate governance, and enhance capital efficiency (Luo, 2011). Since China has a relatively low level of bond financing compared to other countries, increasing proportion of bond financing is a rational choice to optimize the financial structure.

- Soft budget constraints to SOEs should be limited, and defaults should be allowed. This will curb overinvestments among firms and motivate them to be more disciplined in their resource allocation.

6 Household debt

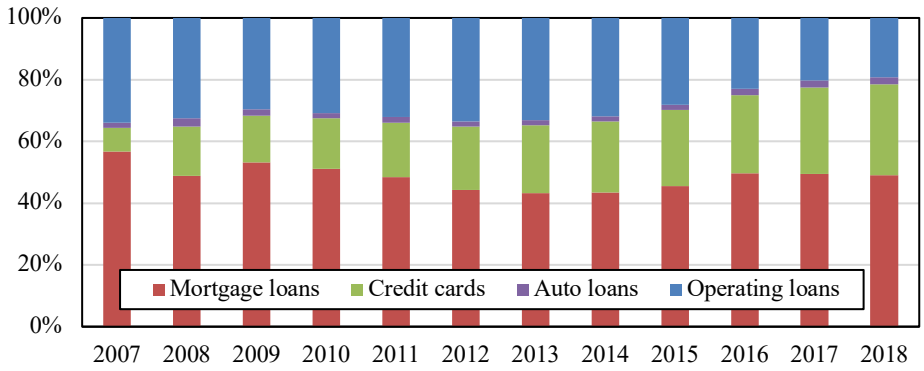
China's household debt has risen significantly, with an average growth rate around 23% over the last decade. Household debt can complement household disposable income for buying expensive products and improving living standards. However, excess household debt may also bring vulnerabilities to the household balance sheet and lead to financial and economic distress (Koo, 2011; Senner and Sornette, 2018). This sector will first give a detailed analysis of the driving forces behind household debt expansion in China, which focuses on mortgage loans and consumer credit separately. Then discussions of its effects on a consumption-driven economy will be given, and long-term concerns will be presented.

6.1 Introduction to China's Household Debt

6.1.1 Definition and characteristics of household debt

Household debt refers to the money that all adults in a household owe to financial institutions. In China, the financing sources of household debt are primarily bank loans, which can be further breakdown into consumption loans such as mortgage loans, auto loans, and credit card loans, as well as operating loans that are used for household mom-and-pop businesses.

Figure 6.1: The composition shift of bank loans to household



Source: all data is published by PBC, can be retrieved from the CEIC database (see Appendix 2). Note: mortgage loans (personal housing loans), credit cards (credit of credit card) and auto loans (automobile purchasing loans) make up the consumption loans (or consumer loans). Over the last decade, the composition of consumption loans increased by nearly 15% while operating loans decreased; among consumption loans, credit from credit card increased rapidly.

Based on **Figure 6.1**, the consumption loans comprise nearly 80% bank loans to households in 2018 and have presented an increasing trend while that of operating loans is decreasing. Among consumption loans, mortgage loans make up the most substantial part of household debt, with its percentage to total loans fluctuating around 50%. The credit card loans have increased significantly, with its composition grew from nearly 10% in 2007 to 30% in 2018.

6.1.2 Data sources

Our data come from various sources including the Chinese Academy of Social Science (CASS), the People's Bank of China, the National Bureau of Statistics (NBS), the Bank for International Settlement (BIS), as well as CEIC and WIND database. Please find details in **Appendix 2: Data sources.**

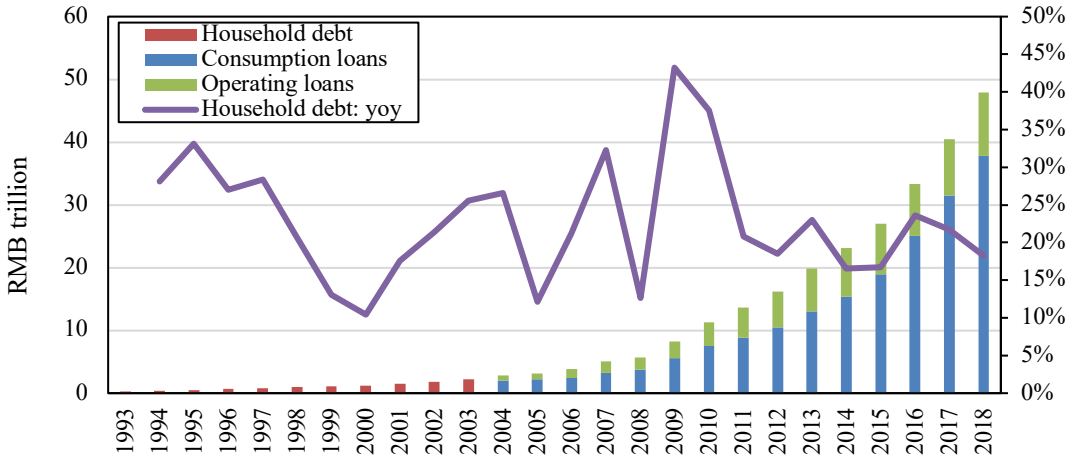
Most household-related data is directly available. BIS (2006-2018) and CASS (1993-2018) both publish the leverage ratio of total household debt in China. Bank loans to households are nearly the same size as total household debt, which is published by PBC (2004-2018) and decomposed into consumption and operating loans. The decomposed consumption loans, more specifically, mortgage loans, auto loans, and credit card loans, are also published by PBC and can be directly extracted from the Wind and CEIC database. CASS also published household balance sheet data, which contains detailed information about household assets and liabilities. Additionally, some related information such as household consumption, disposable household incomes is available through NBS.

6.2 Household debt expansion and drivers behind

6.2.1 China's household debt expansion

China's household debt has risen significantly over the past decades (see **Figure 6.2**), with an average growth rate of around 23%. In 2018, its outstanding debt size had been eight times bigger than a decade ago (from 5.7 trillion RMB in 2008 to 47.9 trillion RMB in 2018) and debt-to-GDP ratio almost tripled (from 18% to 53%). The household debt level also reached 72% of household disposable income in 2016, implying the high debt burden and repayment pressure within households[73].

Figure 6.2: Size and growth rate of household debt: China, 1993-2018



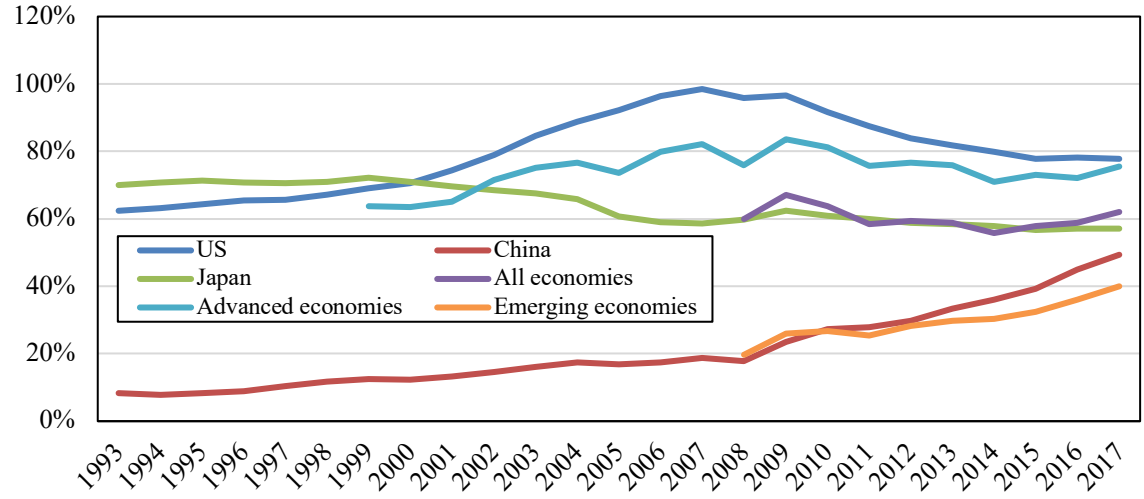
Source: household debt outstanding is published by CASS, the decomposed consumption and operating loans data are published by PBC; please find reference details in Appendix 2. Note: the left scale is used for debt and loan size, while the right scale is for household debt yoy growth rate. The household debt experienced exponential growth with an average growth rate at 23% over the last decades.

However, compared to other countries (see **Figure 6.3**), the household debt-to-GDP ratio is still relatively low. Though fast expansion, China's household debt-to-GDP ratio (53%) was 30% lower than in advanced economies (80%) by 2017. This low level is partially because Chinese residents prefer saving rather than consumption (Zhang et al., 2018). China's household saving rate has remained the highest among all countries, standing at 37% of their disposable income in 2015[74]. As most household debt is used for consumption in China, this high saving rate will hinder the consumption and limit the growth of household debt.

[73] The household disposable income data is available through NBS http://data.stats.gov.cn/english/easyquery.htm?cn=C01. By comparing what households owes (stock) with their annual disposable incomes, it is possible to measure household' ability to repay its debts. The debt-to-disposable income ratio can also be interpreted as the number of years needed to pay back debt if disposable income is dedicated entirely to debt repayment

[74] Household saving rate source: https://tradingeconomics.com/country-list/personal-savings. Net household saving is defined as the subtraction of household consumption expenditure from household disposable income, plus the change in net

Figure 6.3: Household debt-to-GDP by countries: Worldwide, 1993-2017



Source: BIS database https://stats.bis.org/ Note: China household debt-to-GDP ratio grew rapidly after 2008 while this data in advanced economies decreased.

However, it is also clear from **Figure 6.3** that China household debt-to-GDP ratio grew sharply while that in other economies averagely maintained after 2008. Two factors have driven China's household debt growth after 2008. Firstly, as discussed in 4.3.4, the land financing promotes the real-estate market development in China and pushes house price up, making it less possible for households to buy houses without borrowing and hence stimulating the rise of mortgage loans (see more discussion in 6.2.2). Secondly, as innovations on consumer credit are emerging and household consumption behaviors are changing, more people would like to borrow and consume in advance, stimulating the development of consumer credit (see discussion in 6.2.3). As mortgage loans and consumer credit (e.g., credit card) make up the most part of household debt, the expansion of household debt is self-evident.

6.2.2 Mortgage loans and linkage to the real-estate market

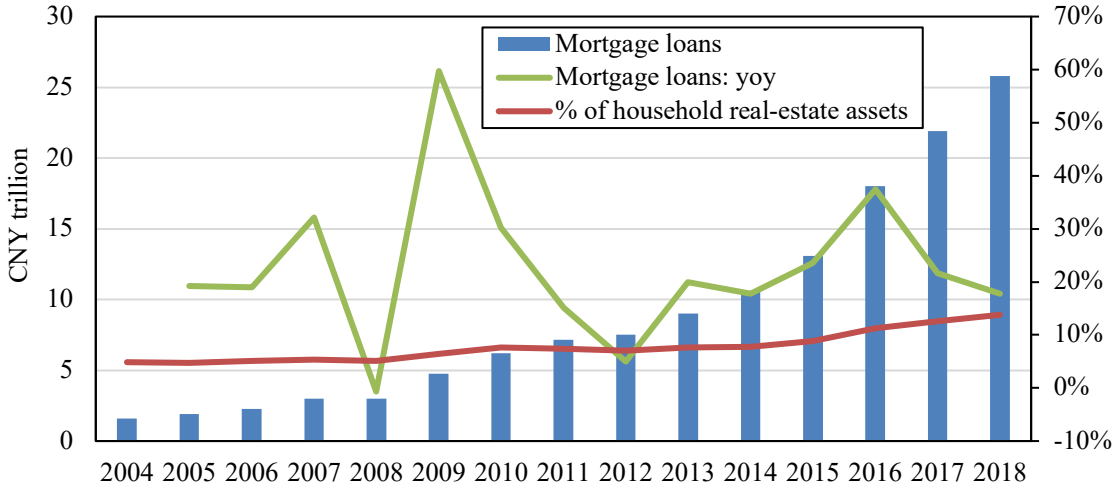
As the most substantial part of household debt, mortgage loans comprise nearly half of household debt in China, hence significantly influence the expansion of household debt.

equity of households in pension funds. Household saving rate is net household saving divided by household disposable income.

Figure 6.4 shows that mortgage loans experienced surges in 2007, 2009 and 2016, and its outstanding size expanded 900% over the last decades. Many factors such as change of mortgage policies (e.g., mortgage interest rate, down payment ratio) and increasing real-estate speculative investments have led to the accumulation of mortgage loans.

The accumulation of mortgage loans started in 1998 when "urban housing reform" was implemented with "No.23 documents"[75]. Since then, the real-estate sector became a new engine for propelling economic growth and mortgage loans begun to increase rapidly (Fang et al., 2016). To facilitate the development of the real-estate credit, the central bank (PBC) put a series of credit management measures in place during 1998-2002 and established the principles and frameworks for mortgage loans supply[76]. At the same time, PBC lowered the mortgage interest rate to encourage house purchases, which significantly stimulated the demand and supply for housing and mortgage loans.

Figure 6.4: The size and key ratios of mortgage loans: China, 2004-2018



Source: mortgage and total loans data is from PBC while residential asset data is from CASS, reference details in Appendix 2. Note: the left scale is for mortgage loans, the right scale is for its yoy growth rate and relative size to residential assets. The mortgage loans supply experienced large increase in 2007, 2009 and 2016. Its relative size to household assets increased steadily, meaning households have been borrowing more when purchasing houses.

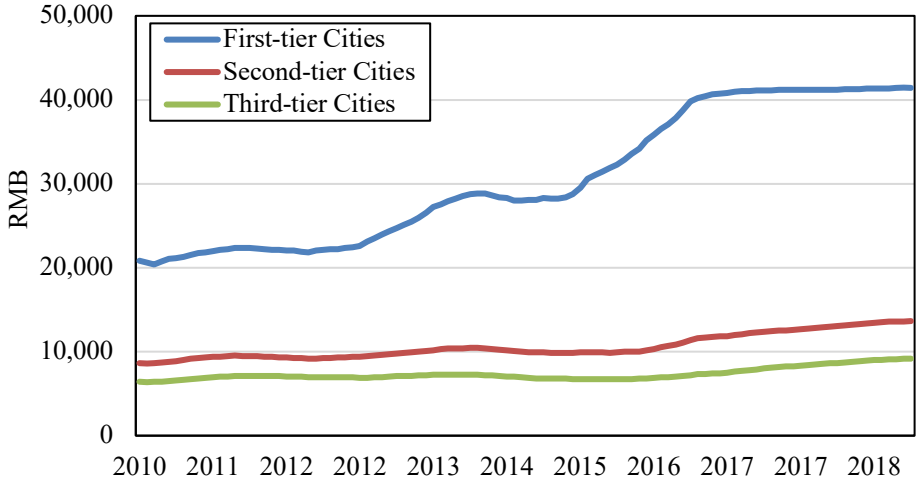
[75] "The Circular of the State Council on Further Deepening the Urban Housing System Reform and Accelerating Housing Construction" (No. 23 [1998] of the State Council). The 1988 urban housing reforms fostered the privatization of housing, which ended enterprise-supplied housing and moved to comprehensive market-based housing provision. See document translation at: http://www.lawinfochina.com/display.aspx?lib=law&id=3078&CGid=

[76] Documents such as "Management measures on individual housing loans" (1998) http://www.cca.org.cn/wqfg/detail/13587.html, "Management measures on auto loans" (1998) http://www.cbrc.gov.cn/chinese/home/docDOC_ReadView/851.html and "Opinions on consumer credit development" (1999) http://www.cmcma.org.cn/html/201010-10/20101010133.htm. All in Chinese.

In 2017, China's stock market experienced substantial growth, and then many households put their earned money into purchasing or investing houses, directly causing the rise of real-estate transactions and mortgage loans. In 2009, the stimulus package promoted investments in low-rent housing and the central bank (PBC) lowered the mortgage loan interest rate and down payment ratio at the same time[77], and mortgage loans surged accordingly. Between 2014 and 2015, to reduce the numbers of unsold homes, the mortgage loan interest rate and down payment ratio were lowered again[78], which stimulated the demand for housing purchase and needs for mortgage loans.

Furthermore, the central bank developed policies to encourage the real-estate market development from the supply side, including broadening the scope of real-estate development loans and allowing presales by developers. At the same time, the land financing among local governments stimulated the land supply and promoted the development of the real-estate market (as discussed in 4.3.4). With these political stimuli on both the supply and demand sides, China's housing market boomed, and the house price ballooned.

Figure 6.5: Residential house price index by cities: China, 2010-2018



Source: Fang.com, see reference details in Appendix 2. Note: the price index selected 100 representative cities to compose the index. First-tier cities (e.g., Beijing, Shanghai, Shenzhen) has risen substantially over the last decade, while second- and third-tier cities maintained.

[77] The down payment ratio was adjusted to 20%; the floor rate of mortgage interest rate was adjusted to 0.7 of benchmark lending rate.
[78] The mortgage interest rate was lower the benchmark lending rate after 2009 while the down payment ratio was adjusted to 20% again.

It can be seen from **Figure 6.5** that the average house price in first-tier cities has been doubled compared to the level in 2010, while the house prices in second and third-tier cities experienced little growth. The surging house prices give households an illusion that the house price will keep rising. Out of the speculative expectation to benefit from house price appreciation and worries about future house affordability, they would like to leverage up to buy houses as early as possible, which in turn accelerate the rising trends of house prices (a positive feedback loop). Based on **Figure 6.4**, the percentage of mortgage loans to households' real estate asset has increased from 5% in 2008 to 14% in 2018, indicating an increasing reliance on mortgage loans for real estate purchase.

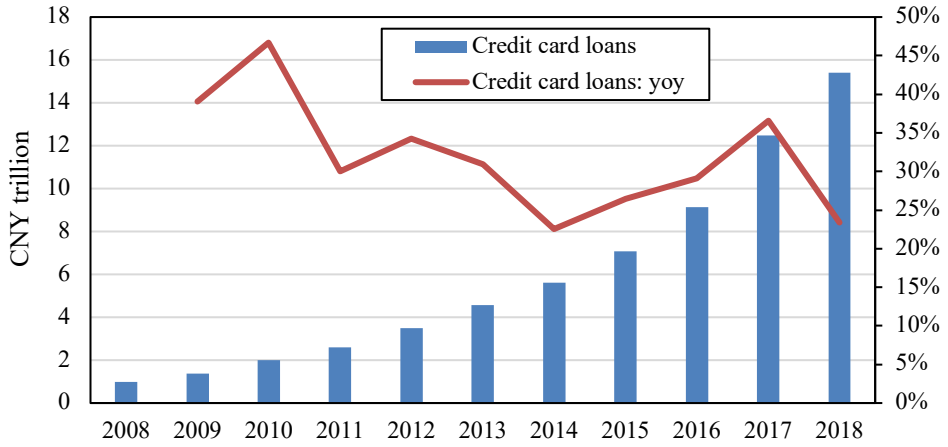
However, this positive feedback loop will increase the possibility of real estate bubbles (Senner & Sornette, 2018) endogenously. Once house prices fall, the heavily indebted households will face shrinkage in their assets and began to deleverage, hence so-called "balance sheet crisis" by Koo (2011) will happen. This balance sheet crisis can lead to debt-deflation cycle as discussed by Minsky (1975), in which people face a reduction of cash flow from assets and need to sell off their asset to repay the debts, causing a further decrease of asset prices and deflation. In the worst case, households may default on their mortgage loans, and the banking system will have systemic risks, resulting in a series of financial and economic distress.

6.2.3 Innovations on consumer credit and changing consumption behaviors

Another driving force behind household debt expansion is the development of short-term consumption loans, which refers to consumer credit for automobile, travel, education, house rental, and digital product, etc.[79] The providers of these type of consumer credit in China include banks and other consumer finance companies like JD Finances and Ant Financial[80].

[79] The typical consumer credit period is less than two years and the amount is between 2,000 yuan and 200,000 yuan, so usually mortgage loans is excluded from this category.
[80] Both are fintech companies providing services like 3rd party payment, virtual credit card, private online banking, and consumer loans. Ant Financial (Alipay): https://www.antfin.com/, JD Financial: https://jr.jd.com/.

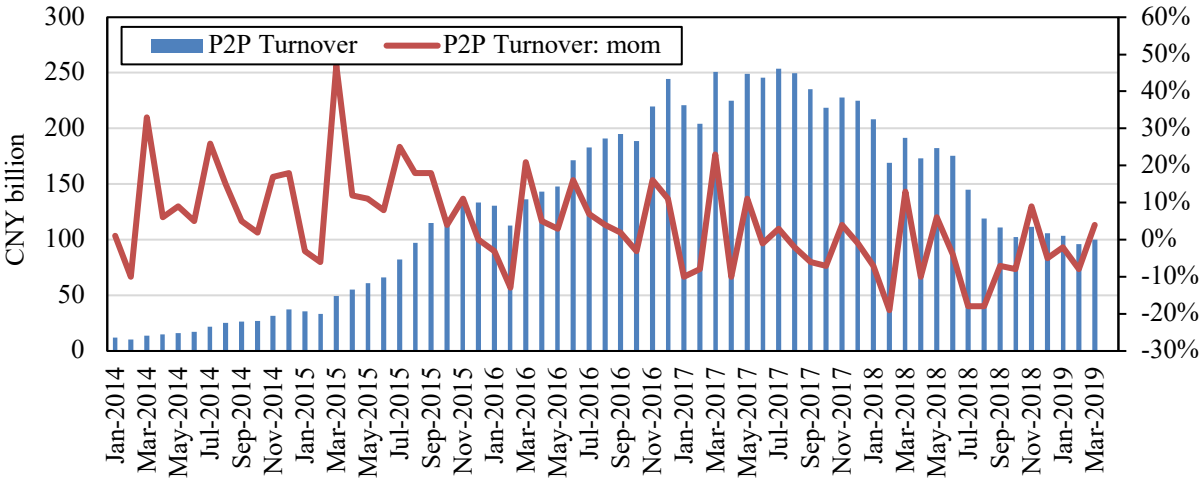
Figure 6.6: The size and growth rate of credit card loans: China, 2008-2018



Source: published by PBC, can be retrieved from CEIC and Wind. Note: the left scale is loan size, and the right scale is yoy growth rate. The credit card loans increased at a rate of around 32% over the last decade.

Credit cards are the most traditional but also the most common way to finance consumer credit in China. Over the past decade, the household debt raised by this financial channel grew rapidly to 15.4 trillion RMB in 2018 with an unusually high growth rate around 32%. At the same time, the payment habits of consumers have changed. Yin (2018) studies the consumer credit development in China and finds that pre-expenditure and instalment consumption became increasingly popular for not only buying cars or houses but also for intermediate and small-amount consumption on digital products, clothing, and travel tickets.

Figure 6.7: P2P turnover and monthly growth rate: China, 2014-2019



Source: www.wangdaizhijia.com Note: the left scale is for turnover and the right scale is its monthly growth rate. The P2P turnover surged sharply after 2014 and peaked in year 2017, after that, the size was controlled around 100 billion RMB.

Additionally, the innovation on consumer credit furthered this trend. Currently, fintech is shifting traditional transactions, payments, borrowings, and financings with internet platforms and mobile apps, and companies like Ant Financial, JD Finance, renrendai (a Chinese P2P company) are emerging to provide different types of credit services (e.g. 3rd party payment, virtual credit card, private online banking, and P2P credit). Through these channels, debt financing becomes more efficient and differential than before (Chen, G. et al., 2018).

Furthermore, peoples' consumption concepts and behaviors are changing with innovations on consumer credit and strong desires for consumption[81]. Borrowing for immediate consumption using credit cards and innovative fintech products like P2P lending becomes increasingly popular, resulting in the fast accumulation of household debt. For example, **Figure 6.7** shows that P2P credit experienced significant rise between 2014 and 2017, with its turnover surged from 10 billion RMB to 250 billion RMB. Nevertheless, this surge raised concerns of the central government, which then published several restrictions on P2P companies and controlled the level to 100 billion RMB[82].

These innovations on consumer credit indeed pose risks in the financial system as most of these fintech products are shadow banking activities out of the central bank's supervision and control. Borrowing and lending in such unregulated and the unlicensed market can be dangerous in consideration of their weak risk management, which may impair households' balance sheet and damage financial stability (Orlik & Chen, 2018).

6.3 Household debt and China's economic development

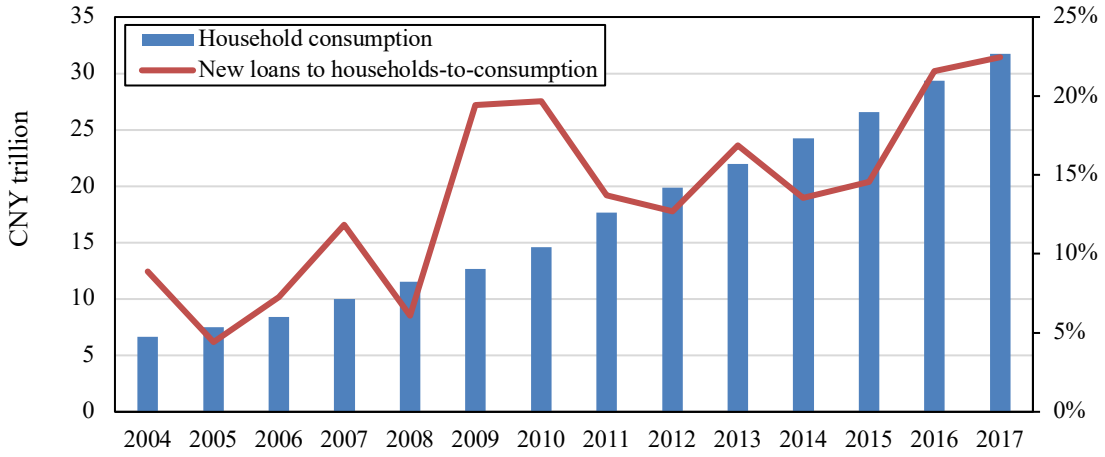
[81] The consumer confidence index in China increased sharply from 100 to 125 over the last decade, indicating a strong expectation for consumption. See https://www.ceicdata.com/en/china/consumer-survey-national-bureau-of-statistics/consumer-confidence-index

[82] "A series of announcements set the stage for China's first regulatory instrument for online lending in August 2016. Called Interim Measures on Administration of Business Activities of Online Lending Information Intermediaries. The interim measures set the business scope of the platforms to be mere information intermediaries. It also asked all platforms to set up custody accounts with commercial banks for investor and borrower funds held by the platforms in order to reduce the risks that platform owners abscond with funds. The measures require online lending platforms to register with their local financial regulatory authority." See https://techcrunch.com/2018/08/01/the-dramatic-rise-and-fall-of-online-p2p-lending-in-china/

6.3.1 The shift towards a consumption-driven economy

Household debt can have a positive effect on economic development in the short run. Many studies (Guo, Yang, and Liu, 2013; Guo & Liao, 2015; Lombardi, Mohanty & Shim, 2017) conduct empirical researches on this relationship in China and confirm the positive correlation. Based on their research, the promoting effect of household debt can be achieved through two channels. Firstly, as discussed in 6.2.2, mortgage loans can encourage the development of the real estate market. Secondly, consumer loans can complement household income and boost economic growth through stimulating consumption.

Figure 6.8: New loans to households relative to consumptions: China, 2004-2017



Source: household consumption data is published by NBS and new loans to households is published by PBC; all data can be retrieved from WIND database. Note: the left scale is for household consumption, the right is for the ratio of new loans to households relative to household consumption (calculated by new loans to households/household consumption). The relative size of new household loans to household consumption has increased rapidly from 6% to 22% over the last decades.

Over the past decade, the composition of consumption loans (i.e., mortgage loans, credit card loans, auto loans) in total bank loans to households has increased (see **Figure 6.1**). These loans were used for consumption on houses, cars, and expensive products, hence largely stimulated consumption demands. Based on **Figure 6.8**, as a component of GDP by income approach, the household consumption grew (averagely 13% between 2008-2018) much faster than GDP growth (averagely 8.1% between 2008-2018) and its size has tripled over the last

decade; at the same time, the ratio of new loans to households[83] relative to annual consumption jumped from 6% in 2008 to 22% in 2017, which implies that household consumption has been increasingly relying on consumption loans.

Furthermore, consumer credit also promotes the development of consumer-related industries (e.g., service industry, consumer goods). With consumer credit, people have stronger desires to buy products and service. For example, based on Volkswagen's report[84], auto sales are closely linked with consumer confidence, and auto financing can facilitate the purchase decision on households in car consumption. Therefore, many auto producers choose to establish auto financing corporations (e.g., Volkswagen established Volkswagen Financing) to promote auto sales through credit financing. Similar trends also happen in the travel industries, with licensed consumer finance companies with industrial background becoming leaders (Chen, Gu & Li, 2018).

As discussed in 2.1, China's economic growth has relied less on investment but more on consumption after the GFC in 2008, and rebalancing towards the consumption-driven economy[85] is highly promoted by Chinese policymakers. Many studies (Lardy, 2007; Nicholas, 2007; Zhu & Kotz, 2011; Pencea & Oehler-sincai, 2015; Zhang, 2016; Chen & Kang, 2018) also suggest a shift towards the consumption-driven economy and a focus on domestic demands. Credit to households can be a critical driving force in transforming the Chinese economy from investment-driven towards consumption-driven. Orlik & Chen (2015) suggest that Chinese policymakers can help to shift incentives for banks and financing companies toward a greater focus on consumer lending.

6.3.2 Long-term concerns about consumption loans

Shifting towards a consumption-driven economy by providing consumption loans could be a way to promote future economic growth. However, to what extent to expand consumption

[83] New loans to households refer to newly issued loans from financial institutions to households every year.
[84] China Auto Finance Consumer Behavior Report.
[85] "It entails shifting from investment to consumption on the demand side, transitioning from industry to services on the supply side, as well as reducing credit intensity and improving allocative efficiency on the input side." (Zhang, 2016)

loans is also critical. Practically, many lessons from international experience show that household debt expansion cannot always bring the desired results and can sometimes trigger financial instability (Orlik & Chen, 2015; Senner & Sornette, 2018). For example, the excess increase in mortgage loans in the U.S. had led to the global financial crisis in 2008 (Merrouche & Nier, 2010).

High debt level in households indicates balance sheets vulnerability, as households leverage against rising asset prices (Filardo, 2008; Koo, 2011; Senner and Sornette, 2018). Once the asset prices collapse, households would find themselves burdened with massive household debt and burdensome interest payments. The dropping asset prices will force households to stop borrowing and deleverage in the balance sheet. This restrained financing demand and associated balance sheet vulnerability will raise risks of personal bankruptcies (Zhu, 2008), which may further lead to financial and economic distress (Minsky, 1975).

Rising household debt will also influence future economic development as it promotes current consumption at the expense of future consumption. Alter et al. (2018) and Mian et al. (2017) give international evidence about the negative relationship between household debt and future GDP growth and say that this negative relationship is stronger when the household debt-to-GDP ratio is above 65%. They further state that easy access to finance household debt may encourage reckless consumptions, making households bear excess household debts. This will put high interest costs and repayment pressure on households, leaving their disposable incomes to reduce and consumption to downgrade in the long run. The high debt level also indicates a higher default possibility, making banks to take the risk of worsening asset quality. Therefore, high household debt level can have negative influences on household consumption and economic development in the long run.

6.4 Summary

Unlike other economies flat growth, China’s household debt has risen significantly over the past decades. However, it is still at a moderate level compared to other countries as Chinese

households prefer saving rather than consumption. The drivers behind China's household debt expansion can be concluded into two aspects:

- Institutional incentives (e.g., low mortgage interest rate and down payment ratio) on mortgage supply, rising house price as a result of urbanization land financing, and increasing speculative behaviors in the real estate market, all drive the real-estate market development as well as the mortgage loan growth from both demand and supply sides. As the most substantial part of household debt, this further promotes household debt accumulation.

- On the other hand, innovations on consumer credit instruments such as credit cards and P2P lending give households more efficient and differential access to credit, combined with changes on consumption behaviors, significantly stimulate intermediate consumptions and associated household debt expansion.

Consumption credit (i.e., mortgage loans, credit card loans, auto loans, etc.) can help China to shift towards a consumption-driven economy, with its promoting effect on household consumption and consumer-related industry development (e.g., consumer goods, service industry). However, excess household debt can also damage the household balance sheet, impair future consumption, and lead to financial and economic distress. Therefore, how to balance promoting effects and potential risks of household debt becomes a key concern for policymakers. Based on our analysis, the following moves could be beneficial to this process:

- Political and institutional incentives should be provided to promote consumer credit. The development of private banks and emerging consumer financing companies should be encouraged, in that households can have more diverse access to debt financing. At the same time, efforts should be made for expanding the coverage of consumer credit service. For example, banks can lower the requirements for using credit cards or cut down the lending rate, while consumer financing companies can expand their service to auto, travel, health care financing, etc.

- Closer supervision on consumer credit is necessary. For example, the fast development of P2P financing attracted excess investments and caused bubbles in the P2P market during 2014-2017. Then wide-spread collapse happened and posed risks in financial stability, calling for close supervision and moderate control on these emerging consumer credit financing tools.

- Stronger control of mortgage loans is needed. While mortgage loans expand too fast and house prices rise too high, limitations on mortgage loans supply (e.g., rise down payment ratio and mortgage interest rate) should be made to deflate the real-estate boom.

7 Conclusions

China has experienced a prolonged economic boom since the 1978 open-up reform, during which investment played an increasingly important role in driving economic growth. Credit is the crux in this investment-driven growth, followed by a credit-investment-income process. Whether it can promote economic growth depends on what purpose it used for – productive investment or speculative transactions, as well as how much it can promote resource allocation efficiency. With these two questions in mind, this master thesis studied China's credit expansion and distribution in the non-financial sector, and then linked it to China's economic growth from both supply and demand sides. The results show that credit has significantly stimulated China's economic growth after the year 2002 when the modern banking system was almost established, while at the same time raised various problems like increasing shadow banking activities, real-estate bubbles, overcapacity, and zombie firms. These problems will threaten financial stability and damage the long-run economic development and, implying an unstainable economic growth in the future.

7.1 Credit as a crux in China's economic growth

7.1.1 Credit expansion and distribution

China's credit has expanded rapidly after 2002 and reached a level close to that in advanced economies. Compared to other countries, the non-financial corporate sector is highly leveraged while that in government and household sectors are relatively low. Corporate debt has contributed to 57% of debt-to-GDP ratio growth after 2008, followed by the household (34%) and government (9%) sector.

From the supply side, the credit expansion is mainly driven by the prolonged loose monetary policies (e.g., low interest rate) and increasing shadow banking financing. From the demand side, the "4 trillion RMB stimulus plan" in 2009 significantly stimulated investments and associated debt-financing in following years. This mostly influences local governments as

most of the stimulus packages are burdened on them. Corporate debt has also ballooned because of their limited access to equity financing and high investment demands. The household debt accumulation is driven by increasing mortgage loan supply and innovations on consumer credit instruments, which in turn stimulate household consumption on houses, consumer products, and services.

7.1.2 Credit and economic growth in China

In China, empirical studies show that credit has a positive promoting effect on economic growth after 2002. However, the boosting effect of credit has been weakened in recent years, due to inefficient credit allocation towards SOEs and infrastructure-related industries, as well as increasing speculative investments in the real-estate market.

More specifically, government debt drives local economic growth through financing infrastructure investments, while at the same time, it may crowd out private investment and hence negatively influence economic development. Among firms and industries in China, credit stimulates the development of infrastructure-related and consumer-related industries.[86] Over-indebtedness and credit misallocation also exist in the corporate sector, bringing problems like industry overcapacity and zombie firms. For households, consumer credit can help China to shift towards the consumption-driven economy, while mortgage loans may harm it considering increasing speculative investments in the real-estate market.

7.2 Other influences

7.2.1 Shadow banking activities

[86] Infrastructure related industries mentioned here include real-estate, construction, transportation and utilities etc.; consumer related industries includes industries producing consumer goods such as cars, food and clothes and service industries such as catering, hoteling, travelling, retailing etc.

The credit comes from both banking and shadow banking systems, with the latter playing an increasingly important role in China. From the supply side, the growth of shadow banking activities is mainly driven by the development of WMPs and stimulus-loan-hangover effects for rolling over matured bank loans by non-banking financings. From the demand side, the limited access to bank loans of local governments and private enterprises have pushed them to the shadow banking financing (e.g., government financing through LGFVs while SMEs financing through P2P lending); the high return of shadow banking products also attracts large numbers of individual investors.

7.2.2 Real-estate market development

The real-estate market in China has developed rapidly after the GFC in 2008. On the one hand, local governments need to repay the debts through land financing, which increases the land supply; on the other hand, because of fast urbanization and 3rd baby boom between 1980 and 1990 in China, demands for housing is increasing and pushing house prices up. The rising house prices attract further speculative purchasing that facilitated by mortgage loans, which in turn pushes house prices to rise more. Accordingly, the real estate market boomed with these stimuli on both supply and demand sides.

However, this house price positive feedback loop will increase the possibility of real estate bubbles. Once house prices fall, households will face shrinkage in their assets, leading to the balance sheet crisis and further financial and economic distress.

7.3 Suggestions for future research

Though the overall debt level in China is close to that in advanced economies, the debt structure is quite different from other countries, with the corporate sector occupying two-thirds of credit resource. This is because corporate equity financing in China is limited, and some policy burdens as well as government debt, are transferred to SOEs. However, to what

extent corporate debt is exposed to the government sector is not clear; whether other influencing factors exist is also worth to explore. The future research can dig one step deeper into this topic, and a better understanding of this non-financial credit distribution can help to guide the credit supply.

This master thesis analyzes the role credit has played in China's past GDP growth from a qualitative perspective, but how much credit has promoted the productivity growth in China is under the research. Future analyses can focus on the quantitative side and investigate the credit's influence on total factor productivity (TFP) growth.

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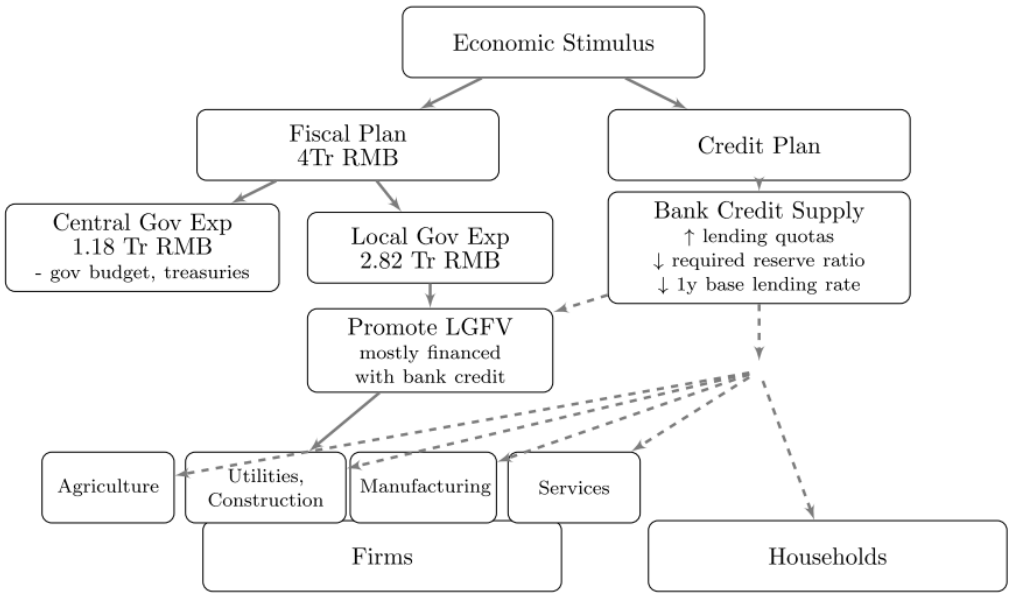
Appendix 1: 4 trillion RMB stimulus plan

In 2008, China experienced a head-on blow by the global financial crisis, which dragged the US economy into the Great Recession. In response, in November 2008, the Chinese premier Wen Jiabao announced to great fanfare a "4 trillion RMB stimulus plan" to be spent on major infrastructures by 2010, with about RMB 1.5 trillion (38%) to be spent on railway, road, airport, water conservancy, and urban power grids; 1 trillion (25%) on post-disaster reconstruction (Wenchuan earthquake occurred in May 2008); 1.14 trillion (28%) on indemnification and comfortable housing, rural livelihood, and infrastructure; and 0.36 trillion (9%) on environmental protection and education (Chen, He & Liu, 2017). These massive investments generated significantly low returns to meet the requirement of sovereign debt repayments (Li, 2013), which decreased the ability of the Chinese government to repay debts and contributed to the increase in the debt burden of the Chinese government.

Figure 0.1: Structure of China Economic Stimulus Plan[87]

[87] The picture is from: Cong, L. W., Gao, H., Ponticelli, J., & Yang, X. (2018). *Credit Allocation Under Economic Stimulus: Evidence from China.* Buffett Institute Global Poverty Research Lab Working Paper No. 17-108. p.33. Available at SSRN: https://ssrn.com/abstract=3126489 or http://dx.doi.org/10.2139/ssrn.3126489


Economic Stimulus
Fiscal Plan
4Tr RMB
Credit Plan
Central Gov Exp
1.18 Tr RMB
- gov budget, treasuries
Local Gov Exp
2.82 Tr RMB
Bank Credit Supply
↑ lending quotas
↓ required reserve ratio
↓ 1y base lending rate
Promote LGFV
mostly financed
with bank credit
Agriculture
Utilities,
Construction
Manufacturing
Services
Firms
Households

Appendix 2: Data sources

M: monthly Q: quarterly A: annual

* These data can also be retrieved from Wind database

Section	Data	Data Sources	Description
Introduction	**Figure 2.1** GDP by country	The World Bank: https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?end=2017&start=1960&view=chart	A: 1960-2017 GDP data in reporting economies
	Figure 2.2 **Table 2.1** GDP, composition, contribution	National Bureau of Statistics (NBS)*: http://data.stats.gov.cn/english/easyquery.htm?cn=C01	A: 1952-2018 Includes the composition of investment, consumption and net export to GDP, and their contribution to GDP growth rate
Bank Debt	**Figure 3.1** External debt	Tradingeconomics:https://tradingeconomics.com/china/external-debt Published by State Administration of Foreign Exchange (SAFE)*	M: 1985-2018 External debt data includes debt outstanding and debt position by sector, creditor.
	Figure 3.1 Financial assets FX reserve assets	Tradingeconomics:https://tradingeconomics.com/china/foreign-exchange-reserves Published by The People's Bank of China (PBC)*	M:1950-2018 Reserve assets and its composition
	Figure 3.2, **Figure 3.3**, **Figure 3.5** Total Social Financing	CEIC database: https://www.ceicdata.com/en/china/aggregate-financing/aggregate-financing Published by PBC*: http://www.pbc.gov.cn/diaochatongjisi/116219/116319/index.html	M 2002 -2018 TSF refers to the total amount of money received by the real economy from financial systems.
	Figure 3.2, **Figure 3.3**, **Figure 3.5** Treasury bonds	CEIC database: https://www.ceicdata.com/en/china/government-debt/central-government-debt-outstanding Published by CASS* (2007-2014), MOF* (2014-2018)	M: 2007-2018 Treasury bonds are nearly the same size as central government debt as it is the primary source of financing for central government.
	Figure 3.2, **Figure 3.3**, **Figure 3.5**, **Figure 3.8** Wealth management products	CEIC database: https://www.ceicdata.com/en/china/banks-wealth-management-product-balance-of-fund Published by Chinaweatlh.com	M: 2007-2018 Wealth management products fund balance data
	Figure 3.2, **Figure 3.3**, **Figure 3.5**, **Figure 3.8** Shadow Banking	Moody's Quarterly China Shadow Banking Monitor:https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_1071420	Q: 2011-2018 Detailed reports about China's shadow banking activities
	Figure 3.4, **Figure 3.7** Non-financial sector credit by country	BIS https://stats.bis.org/	Q: 1996-2018 Credit data can be decomposed into government, private non-financial corporate, and household.
	Figure 3.5	Published by CASS*: http://114.115.232.154:8080/	A: 1993-2018

	Non-financial sector credit by sector		Debt-to-GDP ratio, growth rate and debt outstanding can be calculated out accordingly.
	Figure 3.7 National balance sheet	Published by CASS* http://www.nifd.cn/writings/details/1080	A: 2000- 2014 Includes asset and liabilities of government, non-financial corporations, households.
	Figure 3.9 Mortgage loans Real-estate loans New and Total loans.	CEIC database: https://www.ceicdata.com/en/china/loan/loan-new-increased-real-estate Published by PBC*	Q:2010-2019 The use of new loans and total loans
Government Debt	**Figure 4.1** Local government debt structure	NAO*Announcement No. 35 (2011) http://www.audit.gov.cn/n5/n25/c63566/content.html; Announcement No. 32 (2013) http://www.audit.gov.cn/n5/n25/c63642/part/27403.pdf ; both in Chinese.	The reports documented government debt size in 2010, 2012 and 2013H1, the discrete debt growth rate between 1997-2010, and local government debt composition in 2010 and 2013.
	Figure 4.2, **Figure 4.3** Central and local government debt	Published by CASS*: http://114.115.232.154:8080/	A: 1993-2018 Debt-to-GDP ratio, growth rate and debt outstanding can be calculated out accordingly.
	Figure 4.4 General government debt	BIS https://stats.bis.org/ IMF https://www.imf.org/en/Data	Q: 1996-2018
	Figure 4.5, **Figure 4.6** Government fiscal revenue and expenditure	Published by NBS*: http://data.stats.gov.cn/english/easyquery.htm?cn=C01	A: 1950-2018 Can be decomposed into central and local fiscal revenue and expenditure
	Figure 4.8, **Figure 4.9** Government balance sheet	Published by CASS* http://www.nifd.cn/writings/details/1080	A: 2000-2013 Central and local government assets and liabilities.
Corporate Debt	**Figure 5.2** Listing firm debt composition	Provided in from JP Morgen report https://www.jpmorgan.com/cm/BlobServer/A_Primer_on_the_Financial_Policies_of_Chinese_Firms.pdf?blobkey=id&blobwhere=1320725865930&blobheader=application/pdf&blobheadername1=Cache-Control&blobheadervalue1=private&blobcol=urldata&blobtable=MungoBlobs	Year 2015 Population includes all non-financial companies in each index (e.g. China SSE, US S&P 500, UK FTSE, Germany DAX)
	Figure 5.2 Non-financial sector credit by country	BIS https://stats.bis.org/ IMF https://www.imf.org/en/Data	Q: 1996-2018 Credit data can be decomposed into government, private non-financial corporate, and household.
	Figure 5.1 Corporate debt	Published by CASS*: http://114.115.232.154:8080/	A: 1993-2018 Debt-to-GDP ratio, growth rate and debt outstanding can be calculated out accordingly.

	Figure 5.3 Non-financial corporate balance sheet	Published by CASS* http://www.nifd.cn/writings/details/1080	A: 2000-2015
	Figure 5.3, **Figure 5.4** SOEs balance sheet data	Published by SASA* http://www.sasac.gov.cn/n2588035/n2588330/n2588370/index.html	A: 2003-2014 Includes balance sheet data by industry and composition
	Figure 5.4 GDP and contribution share	National Bureau of Statistics*: http://data.stats.gov.cn/english/easyquery.htm?cn=C01	Q: 1978-2018 GDP and component contribution to GDP growth by industry under income approach.
	Figure 5.5 Industrial leverage ratio of listing companies	Ivan & Zurawski (2017) using CSMAR and Wind database	A: 2002-2016 The leverage ratio is debt-to-asset ratio.
	Figure 5.6 Indicators of industrial enterprises	National Bureau of Statistics*: http://data.stats.gov.cn/english/easyquery.htm?cn=C01	M: 1996-2018 Indicators includes income and expense, assets and liabilities.
	Figure 5.7 Non-performing loans	CEIC database: https://www.ceicdata.com/en/indicator/china/non-performing-loans-ratio Published by PBC*	Q: 2005-2018 Non-performing loans ratio in commercial banks.
Household Debt	**Figure 6.1**, **Figure 6.4** Personal housing loans	CEIC database: https://www.ceicdata.com/en/china/loan-consumer-loan/cn-consumer-loan-residential-housing-mortgage-loan Published by PBC*	Q: 2004-2018
	Figure 6.1, **Figure 6.6** Credit of credit cards	CEIC database: https://www.ceicdata.com/en/china/bank-card-statistics?page=2 Published by PBC*	A: 2008-2018
	Figure 6.1 Automobile purchasing loans	CEIC database: https://www.ceicdata.com/en/china/loan-consumer-loan/cn-consumer-loan-automobile-purchasing-loan Published by PBC*	A: 1996-2018
	Figure 6.1, **Figure 6.2** Loans to households	Published by PBC* http://www.pbc.gov.cn/diaochatongjisi/116219/116319/index.html	A: 2004-2018 Can be decomposed into short and mid-to-long term, consumption and operating loans
	Figure 6.2 Household leverage ratio	Published by CASS*: http://114.115.232.154:8080/	A: 1993-2018 Debt-to-GDP ratio, growth rate and debt outstanding can be calculated out accordingly.
	Household disposable income	Published by NBS*: http://data.stats.gov.cn/english/easyquery.htm?cn=C01	A: 1992-2016 Income distribution to households by income approach
	Figure 6.3 Household debt by countries	BIS https://stats.bis.org/	Q: 1952-2018 Includes size and debt-to-GDP ratio.

	Figure 6.4 Household balance sheet	Published by CASS* http://www.nifd.cn/writings/details/1080	A: 2000-2015 Includes detailed assets and liabilities data.
	Figure 6.5 Household price	Published by press Fang.com https://fdc.fang.com/index/BaiChengIndex.aspx	100-cities residential house price
	Figure 6.7 P2P turnover	Published by press www.wangdaizhijia.com	M: 2014-2019 P2P monthly turnover and growth rate
	Figure 6.8 Household consumption	Published by NBS*: http://data.stats.gov.cn/english/easyquery.htm?cn=C01	A: 1952-2018 Household consumption expenditure by income approach
	Figure 6.8 FIs new loans	Published by PBC*: http://www.pbc.gov.cn/diaochatongjisi/116219/116319/index.html	M: 2004-2015 Financial institutions' newly issued loans to households

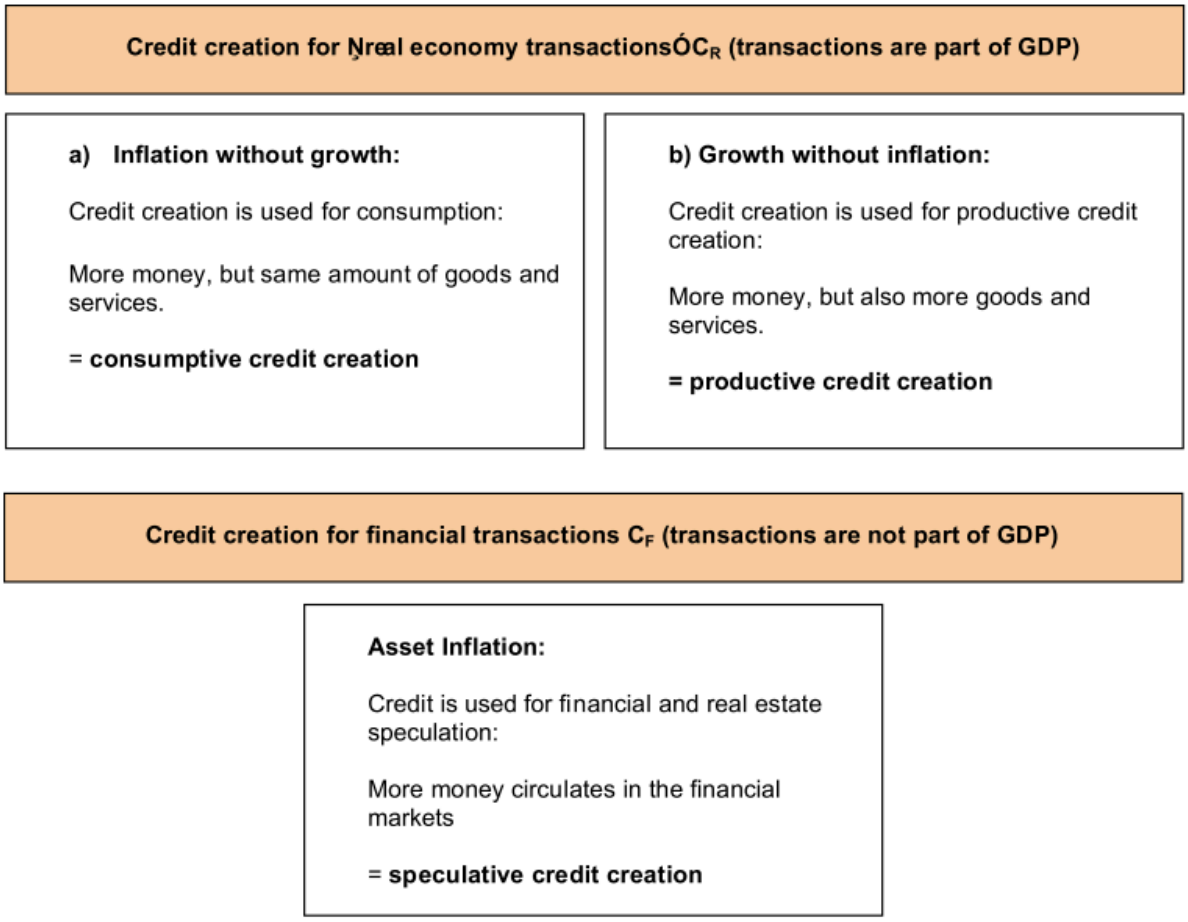
Note: data are retrieved from CEIC, BIS and Wind database in April and May in 2019.

Appendix 3: Purposes of credit creation

Werner (2005, 2009, 2010) and (Stoop, 2010) distinguishes credit created for real purposes and for speculative transactions.

- Credit for real purposes includes loans to the real economy like small and medium manufacturing companies (productive), and credit for the purchase of consumer goods such as cars or electronic equipment (non-productive).
- Speculative transactions encompass credit for real estate speculation (mortgages, real estate investment funds), loans to SIVs (Special Investment Vehicles), hedge funds, margin loans or loans to non-bank financial institutions

Figure 0.2: Purpose of credit creation[88]



[88] The figure is from: Stoop, M. (2010) Credit Creation and its Contribution to Financial Crises.

Appendix 4: Breakdown of financial credit and non-financial sector debt data

RMB trillion	2002	2004	2006	2008	2010	2012	2014	2016	2018	Source
GDP (current price)	12.2	16.2	21.9	31.9	41.2	53.9	64.1	74.0	90.0	NBS
Total credit	16.4	22.9	29.6	43.1	73.6	105.4	148.9	198.7	250.4	-
(as % of GDP)	135%	142%	135%	135%	179%	196%	232%	269%	278%	-
Banking credit	15.6	21.4	27.4	38.0	60.1	81.7	107.1	138.7	184.6	-
(as % of GDP)	128%	132%	125%	119%	146%	152%	167%	187%	205%	-
RMB loans	12.8	17.3	22.2	29.9	47.3	63.3	82.4	106.3	140.4	PBC
FX loans	0.5	0.8	0.9	1.2	2.2	3.1	3.5	2.6	2.2	PBC
Corporate bonds	0.1	0.1	0.6	1.4	3.8	7.5	11.7	17.9	27.1	PBC
Treasury bonds*	2.2	3.1	3.7	5.5	6.8	7.8	9.5	11.9	14.9	CASS
Shadow banking credit	0.8	1.6	2.2	5.0	13.5	23.8	41.8	60.0	65.8	-
(as % of GDP)	7%	10%	10%	16%	33%	44%	65%	81%	73%	-
Entrusted loans	0.5	0.8	1.1	1.9	3.6	5.2	9.3	13.2	12.4	PBC
Trust loans	0.2	0.2	0.2	0.7	1.5	3.0	5.3	6.3	7.9	PBC
Undiscounted bankers' acceptances	0.2	0.3	0.5	1.3	4.1	6.2	6.9	3.9	3.8	PBC
WMPs	-	-	-	0.6	2.8	7.1	15.0	29.1	32.1	Chinawealth
Others**	-	0.2	0.4	0.6	1.4	2.3	5.2	7.5	9.6	Moody's

% of GDP	2002	2004	2006	2008	2010	2012	2014	2016	2018	Source
Non-financial sector debt	137%	151%	143%	141%	180%	190%	217%	240%	244%	-
Household	15%	17%	17%	18%	27%	30%	36%	45%	53%	CASS
Corporate	98%	106%	99%	95%	120%	128%	142%	158%	154%	CASS
Government***	25%	28%	27%	28%	33%	32%	39%	37%	37%	CASS

Note: Source URL please find in Appendix 2.

Treasury bonds is issued by CASS for central government financing, hence it is also banking credit.*

*Others** includes informal lending, financial leasing, microcredit, pawn shop loans, online "peer-to-peer" lending, asset-backed securities and consumer credit companies.*

*Government***: by 2018, some financing platform debt was included, and the overlap with non-financial corporate debt was removed from the non-financial corporate sector.*