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Assessing China’s Capital Requirement and Systemic Challenges

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1. How does Beijing govern capital allocation?

Thanks to rapid economic growth and relentless financial market reform in the past thirty years, China has developed a fairly sophisticated financial system. If “central government governing capital allocation” refers to allocation via various directives from the central government, as Beijing did before the 1980’s, then I believe it is a quite misleading phrase.

In today’s China, capital allocations are achieved by different forms of financial intermediations in various financial markets. These financial intermediaries range from traditional commercial banks to modern Venture Capital funds, some of which are more market-driven than others. I will come back to the detailed channels of capital allocation in Q2.

Regarding detailed asset allocations in China across different sectors, Table 1 gives two snapshots for 2010 and 2016 (RMB trillions, with percentages of total assets given in parentheses):

Sector Year	Household	Non-financial	Financial	Government
2016	177 (42%)	199 (47%)	2.9 (0.7%)	46 (10%)
2010	87 (40%)	93 (43%)	2.0 (0.9%)	35 (16%)

Table 1: Asset ownership across different sectors in China, 2010 versus 2016; Trillion RMB. Data source: Li, Yang, Xiaojing Zhang, and Xin Chang. 2015. China National Balance Sheet 2018). Beijing: China Social Science Press

This table calculates net assets (i.e., equity, which is assets minus liabilities), which naturally gives a small size for the financial sector. Households control a relatively large fraction of assets in China, thanks to the soaring value of real estate over the past two decades. The relative importance of the non-financial sector has kept rising since 2010, while the government’s ownership has been diminished. Once important caveat, of course, is that the non-financial sector includes many strategically important state-owned enterprises (SOE), and they are mandated to fulfill government duties in some circumstances.

I will explain the tools used by the central government to influence capital allocation in Q3.

2. How do China’s banks structure their loans to different actors in the Chinese economy, and what does that structuring reveal about their capital requirements?

Financing Cost and Debt Maturity

Let me focus on interest rates and maturity, and their gaps between state-owned enterprises (SOE) and non state-owned enterprises (non-SOEs).

The data on corporate bonds are publically available, with detailed interest rate and bond maturity information. My analysis of bank loans is based on financial data of listed companies in China. Since we lack a trustworthy dataset that reports actual interest rate data on bank loans, I estimate interest rate by taking the ratio between interest expense and average outstanding interest-bearing debt each year. And, some companies voluntarily disclose their loan maturity information in their annual reports, which allows me to calculate the bank loan maturity for SOE and non-SOE firms.

Figure 1 shows the result. The top two panels are for bank loans, with the left (right) panel depicting the interest rate (loan maturity) since 2009. We observe that SOE firms have lower interest rates than their non-SOE peers, with an average wedge of 43 bps (0.43%). Loan maturity—wise, the overall maturity is about 2-3 years, and there is no significant difference between these two groups of firms—except in 2011 and 2012 during which SOEs borrowed longer-term than non-SOEs. The bottom two panels in Figure 1 are for corporate bonds. Again the SOE firms are paying lower interest rates, by about 99 bps, and borrow slightly longer-term.

The interest rate wedge reflected in the sample of listed companies tends to be downward biased, simply because only exceptional private companies are eligible to be listed. To address this potential bias, I further calculate the interest rate wedge based on the annual census of enterprises collected by the Chinese National Bureau of Statistics, which covers firms with sales over 5 million RMB (about 600 thousands USD) in the manufacturing sector.¹ Most firms in this sample are non-listed, and according to my calculations, SOEs paid about 200 bps (2%) less than non-SOEs during 2005–2013. There is no loan maturity information for this sample.

Broadly, there are two major mechanisms behind the significantly positive interest rate wedge between non-SOE and SOEs. It is crucial to clarify the relative importance of these two forces in different contexts.

- i. The first force is directly related to policy guidance of certain industries and sectors. For instance, Beijing has issued various rounds of industry policies that favor certain sectors (e.g., new energy vehicles) deemed to be strategically important for domestic development as well as international competition. On the other hand, the real estate sector is often disfavored, as local governments occasionally raise the minimum down payment requirement for the second home-purchase to curb over-heated housing market. In today's China, since most of these policy supports are through explicit subsidies (reported in formal financial statements), these policies have only limited impact on the interest rate that banks charge on their loans.

Industrial policies form the backbone of China's economic growth, but will be distortive—at least in some dimensions—by their own nature. Before the 1990's, this was perhaps the only policy tool for Beijing to govern its capital allocation, and has been instrumental for China to develop its modern industrial sector. Recently, Beijing has realized the potential harm of industrial polices, and it is on the policy agenda to make them less distortive.

- ii. The second force, which is an awkward combination of the market mechanism and (the belief of) government intervention, is more relevant in China. Banks, as well as other players including naïve retail investors and sophisticated fund managers, are way more willing to lend

¹ Controlling for the industry makes the comparison across different ownership structures more informative, but the drawback of this dataset is the lower quality of financial information.

to firms who are less likely to default. This is driven by a standard profit-seeking motive, the very essence of a market mechanism. Relative to non-SOEs, SOEs are less likely to default on their debts, either because they are less sensitive to aggregate economic shocks (as they are in a more advantageous industry), or because the local/central government will step in after bad performance for social stability reasons (e.g., employment). The latter “bail-out” reflects the same spirit of “too big to fail” in the US banking industry, just with a way larger scale in China.

Going forward, policymakers in Beijing will likely continue the industry policies mentioned in i), although in my opinion the subsidy scheme could be improved with more transparency and fairness. In contrast, policymakers in Beijing have been trying relentlessly to address the issue mentioned in ii), as they understand that China’s future growth engine will likely come from private businesses. The tension reflected in ii) is deeply rooted in the intricate interaction between market and government, a topic that has recently drawn heated debate even among the western world. As a result, there is no silver bullet for China to solve this extremely challenging problem, especially given Beijing’s stand on the role of government in its economic reform. A related discussion can be found in Q3.

New LPR Reform in August 2019

So far we have focused on the wedge of financing cost between SOEs and non-SOEs. An equally important issue that sits on Beijing’s policy agenda concerns how to lower the financial cost of its real economy. And, because SOEs have been enjoying the preferential treatment due to reasons mentioned above, any reform that can successfully lower the real sector’s financial cost will predominantly benefit the non-SOE firms.

The most recent new Loan Prime Rate (LPR) reform, implemented by People’s Bank of China (PBOC, the central bank in China) is aimed to achieve this goal, with a potentially far-reaching impact on China’s banking system in the next decade. The background of this reform is the PBOC’s ambition to establish an effective monetary policy transmission mechanism, which has a profound effect on its agenda of interest rate liberalization, and ultimately, the modernization of the Chinese capital market.

Loan prime rates (LPR), widely used as an indicator of the borrowing cost of the real economy, are the interest rates that banks charge their most creditworthy customers. Before August 2019, Chinese banks set their interest rates based on the so-called “benchmark lending rate,” which plays a similar role as loan prime rates.

The benchmark lending rate aggregates the quotations of 10 largest commercial banks. The quotations are at the level of interest rate, and collected daily. Many influential academics and policymakers in China believe that these large commercial banks are colluding for better profits. As shown in Figure 2, the PBOC policy rate—medium-term lending facility (MLF), which is a funding facility that the PBOC extends to commercial lenders—was cut by 50 bps at the beginning of 2016, but the benchmark lending rate has remain constant since 2016

Beijing, which has been fighting against economic slowdown for several years, was deeply concerned about the clogged transmission of monetary policies. On August 2019, the PBOC

announced that it would replace the benchmark lending rate with the new LPR.² Under the new regime, gradually LPR will be used as a benchmark to price new loans and existing floating rate loans (both industrial and home mortgage loans). I highlight several points regarding this reform:

- i. Increasing the number of participating financial institutions that submit LPR quotations, from 10 to 18 entities. The additional 8 entities include smaller rural commercial banks, foreign commercial banks—Standard Chartered Bank (China) and Citibank (China), and nascent fintech-based lenders—WeBank (Tencent group) and MyBank (Alibaba group).
- ii. Setting the loan prime rate on the 20th of every month, instead of daily. Presumably, less frequent quotation makes the quotation quality higher.
- iii. Asking the participating banks to submit their quotations of the LPR rate in terms of its spread over the policy rate MLF, as opposed to the LPR itself.

To me, the most interesting reform is iii). As explained, the leading explanation for the sticky benchmark lending rate is collusion among participating banks. Beijing could take the non-market route to use its authority to investigate collusion, but it is difficult to identify “collusive behaviors” (n.b., the same problem exists in western financial market).

Instead, Beijing just changed the quotation from the loan rate itself to its spread over the MLF policy rate. This way, even if participating banks collude so that quoted spreads barely move, the loan rate—which is the policy rate MLF plus the average of quoted spreads—will go in tandem with the MLF policy rate. When the PBOC decides to cut the policy rate, this mechanism could help transmit its loosened monetary policy to the real sector in an effective way. The data from the past four months shown in Figure 2 seems to suggest that this reform indeed works to a large extent.

3. How does the central government’s capital allocation practices impact different actors (e.g. banks, local governments, corporates) and their respective abilities to meet their financial needs?

Aggregate Financing to the Real Economy: Financing Channels in China

Released by PBOC since 2011, the Aggregate Financing to the Real Economy, which is also referred to “Total Social Financing” in some other contexts, asks how China finances its real economic activities in a given period of time. As one of the most important economic statistics in China, the Aggregate Financing to the Real Economy offers a detailed breakdown of various financing forms, which is extremely informative about what drives economic growth in China. As a result, it has increasingly drawn attention from almost all market participants for gauging the near-term direction of domestic economic growth as well as any potential policy shifts from Beijing.

Figure 3 depicts the annual increment of the Aggregate Financing to the Real Economy starting in 2006, along with the real GDP growth in mainland China. The financing channels, in (reverse) order of “market-based rules,” are:

- i. Bank loans, an indirect finance channel, are still the dominant financing channel for China’s economy. The big-four state-owned banks have experienced a steady retreat since

² The Loan Prime Rate was initially introduced in October 2013 in China. So the August 2019 new LPR reform is also being reported as a revamp of the old LPR scheme.

restructuring in the early 2000's,³ and their total assets as a fraction of the banking sector dropped from 64% in 2002 to 35% in 2018. As I will mention later, regional and smaller (though, still state-owned) commercial banks have made a significant contribution to the recent growth of the Chinese economy.

- ii. Corporate bonds, as a new form of direct financing instruments in China, have become increasingly important in the past decade. Most of them are issued and traded on China's so-called interbank market, a market that will be discussed in more detail in Q4. Admittedly, corporate bonds are still tightly linked to the banking system, but over time more and more non-bank financial institutions have participated in this market. The recent surge of corporate defaults, which breaks the "implicit guarantee," is a path-breaking step toward establishing a well-functioning risk-based pricing mechanism in China's corporate bond market.
- iii. Shadow banking is crucial to understanding China's financial market development in the past decade.⁴ It not only helps the financing of small and medium enterprises, but also aggressively engages in various regulatory arbitrage practices that channel funds toward real estate and local government financing vehicles (to be explained later). However, shadow banking activities slowed down in a dramatic way following regulatory tightening since mid-2017, and even shrank significantly recently; in Figure 3, shadow banking (indicated by the darkest shade) has a negative increment in 2018.
- iv. Although the Chinese stock (equity) market has received widespread attention perhaps due to its notoriously high volatility, it played an almost negligible role in terms of capital allocation (about 2% of the Aggregate Financing in 2018). Facing mounting criticism for heavy reliance on debt, top policymakers in Beijing fully understood that equity financing is better for bringing about economic stability, structural balance, and even wealth equality in the long-run. However, with numerous scandals and hence a tarnished reputation, the Chinese stock market is far from a preferable savings vehicle for typical households in China.

In the past few years, Chinese stock market has undergone a series of reforms that aim to revert this trend. Among them, the creation of the STAR market (based on a market-oriented registration system) on the Shanghai Stock Exchange in June 2019 could be a milestone event, and revamp of the securities law in early 2020 will give regulators more teeth.

- v. Another important financing channel, which is rather small in terms of magnitude, is venture capital and private placement funds. Not surprisingly, since these funds invest in promising high-tech industries, they represent the perhaps the most vibrant market in China. I expect an accelerated growth of this market going forward, as the STAR market mentioned in iv) provides an organic exit channel for venture capital funds.

Detailed Funding Sources

³ The big-four state-owned banks are Agriculture Bank of China, Bank of China, China Construction Bank, and Industrial and Commercial Bank of China.

⁴ Shadow banking includes Trust loans, entrusted loans, and undiscounted banker's acceptance. Because of severe doubt-counting issues, wealth management products are never a part of the Aggregate Financing to the Real Economy (which is the correct treatment).

Today, each distinct actor can seek financing in China's multi-faceted markets by choosing one that fits—of course, subject to various regulatory restrictions and some broad policy guidance. To answer Q3 more directly,

- i. Banks, especially large ones, are mainly funded by deposits (held by households). Some smaller and regional banks, especially those small joint-stock commercial banks and city commercial banks, fund themselves by selling a kind of short-term corporate bonds in the interbank market. These short-term corporate bonds are purchased by other larger commercial banks or money market funds (see more details in Q4). In this way, large commercial banks and money market funds are funding these small regional banks.
- ii. Local governments started selling “municipal bonds” in the interbank market; banks have been the major buyers of these bonds. Before 2015, local governments financed themselves by either banks loans or corporate bonds (so-called “municipal corporate bonds” or Chengtou bonds, which are different from “municipal bonds” after 2015), but via so-called local government financing vehicles (LGFVs). Municipal corporate bonds continued to exist even after 2015, and their major buyers are wealth management products or non-financial institutions like mutual funds or insurance companies.
- iii. Corporations in China have lots of options. Listed companies can either do seasoned equity offerings in the stock market (subject to fairly strict eligibility criteria), or issue corporate bonds. Non-listed companies can issue corporate bonds.
- iv. For households, their major borrowing needs are housing mortgage loans. Beijing has been imposing strong influence on the mortgage market, given the critical role of housing assets in China's capital market. The younger generation of households also has high demand for consumption loans, which are typically met by credit cards or the rising tech-driven consumer finance industry in recent years.
- v. Let me add that Asset-Backed Securities (ABS), as a form of corporate bonds, have experienced dramatic growth in recent years thanks to the fast-growing fin-tech industry. The biggest seller in the ABS market is Ant Financial, which funds its consumer-credit loans and small-business loans by selling ABS to various institutional and retail investors.

Beijing's Policy Tools of in Influencing Capital Allocation

Equipped with a multi-faceted financial market, a variety of financial intermediaries, and a fast growing list of financial products, the central government in China has a rich set of policy tools to affect the working of China's financial market, and consequently, to influence capital allocation. These policy tools include explicit subsidies to certain industries as mentioned in Q2, and in this section I will focus on the role of the market in Beijing's policy interventions today.

Let me illustrate this point using an event study on recent policies that favor private enterprises. Deleveraging and tightened shadow-banking regulations starting in 2016/17 struck a significant blow to the Chinese economy. The negative shock was especially damaging for private enterprises, for reasons that I have mentioned in Q2. To counter this, starting in mid-2018 the central government has pushed the following reforms:

- i. The new LPR reform mentioned in Q2.

- ii. From the angle of direct financing, Beijing asked regulators in the stock market (equity) and the interbank market (corporate bonds) to lower the entry barrier for private firms. Indirect financing—wise, large state-owned banks have, anecdotally, been encouraged to lend more aggressively to private enterprises—though, it is directly against their profit maximization objective. I therefore believe the policy push will be more effective on the side of direct financing (i.e, lowering the issuance barrier).
 - iii. In 2018, the sharp drop in the Chinese stock markets drove many private firms’ stock-pledge loans underwater, and it could have been devastating if the fire-sale of pledged stocks had adversely affected the banking sector. Together with local governments, Beijing has set up a series of bail-out funds for listed private firms. Most of these bail-out funds had detailed exit plans, so to a large extent they mitigated the widely held concern that “the state advances and the private sector retreats.”
 - iv. On the corporate bond side, even if the interbank market were to lower the entry barrier for private firms, they often face difficulty in selling their bonds, especially given the surging defaults of private firms nowadays. To address this issue, the central and local governments set up some “credit-enhancing” funds only to help private firms sell their corporate bonds. Thanks to the credit-enhancing products—in the same spirit of Credit Default Swaps contracts—that are already available in the market, the “credit-enhancing” funds just sell these financial products to bond investors.⁵ For a similar policy intervention by PBOC in helping a troubled regional bank, see Q4.
 - v. Progressively, Beijing is destined to allow more private players to enter upper-stream industries, say energy, electricity, railways, telecommunications, and gas. Compared to the financial market interventions mentioned above, this seems to be a much “deeper” economic reform, potentially with profound impact on China’s long-term growth.
4. What does the recent spate of regional bank bailouts in the Chinese economy (e.g., Baoshang Bank, Bank of Jinzhou, Hengfeng Bank) reveal about the way capital is raised in China? How do the systemic risks unearthed by these bailouts impact the ability of banks to raise capital moving forward?

Since China established its two stock exchanges in the early 1990’s, the growth speed of Chinese financial market has been second to none in the world. Since 2010, the financing demand unleashed in almost all sectors propelled an accelerated—and even rampant—growth of financial innovations, at a pace with which regulators cannot keep up.

For me, the running theme of China’s financial market development in the past decade has been “underdeveloped financial markets with overdeveloped financial products.” Here, “financial markets” refer to price discovery mechanisms, prompt regulations, legal standard and enforcement, complete and transparent trading rules, and many other institutional infrastructures that integrate all different market participants together.

This fundamental tension will certainly cause unbalanced growth somewhere, which, unfortunately, will be burst sometimes. This is exactly what we are seeing with the recent turmoil in the Negotiable Certificate of Deposit (NCD) market and the three troubled regional banks in the

⁵ Of course, these “credit-enhancing” funds charge a price significantly below the hypothetical market price (oftentimes, without charging any price). But this is a standard international practice.

summer of 2019. The underlying economic mechanism is almost identical to the wholesale funding turmoil preceding Lehman's collapse in the 2007/08 global financial crisis, and Beijing has learned a great lesson from this.

The NCD Market

As a money market instrument commonly used in the US market, an NCD is a certificate of fixed-term deposit issued by depository institutions in China's interbank market. As its investors are other banks or non-bank financial institutions, the NCD plays a role of wholesale funding together with liquidity management for financial institutions in China. The left panel in Figure 4 shows that the NCD market grew rapidly since its inception in December 2013. Its outstanding balance reached 9.8 trillion RMB at the end of 2018, thanks to its high credit quality (guaranteed by issuing banks), excellent secondary market liquidity, and reasonable premium over the risk-free benchmark offered by government bonds.

Typical issuers of NCDs are small joint-stock commercial banks (Hengfeng Bank) and city commercial banks (both Baoshang Bank and Bank of Jinzhou), while buyers of NCDs are large state-owned banks (e.g., the Big-Four) or their wealth management products, as large state-owned banks enjoy cheap funding sources either from retail deposits or various central bank facilities. Rural commercial banks, money market funds, and mutual funds (broadly defined to include asset management plans funded by wealth management products) have also been investing in NCDs for favorable returns.

The Baoshang Event and Restructuring of Bank of Jinzhou and Hengfeng Bank

On May 24th, 2019, the PBOC and the CBIRC announced to take over Baoshang due to "severe credit risk." All retail depositors—and corporate deposits up to 50 million RMB—were guaranteed, thanks to the deposit insurance established in 2015. For interbank debts, which included NCD, creditors could have lost up to 30% of their principals.

The market was shocked by the radical action of the regulators. The NCD market was almost frozen for at least one week, contributing to the sharp drop of total NCD issuances in 2019 (the right panel in Figure 4). The PBOC then rolled out some other lending facilities which helped calm the NCD market, but market participants started to shun away from troubled city commercial banks, among them Bank of Jinzhou and Hengfeng Bank. (Many economists, including me, believe it is a great move for Beijing to awaken the NCD market to its risks.)

Bank of Jinzhou and Hengfeng Bank are typical regional small business lenders in China. They suffer serious corporate governance issues (i.e., controlling shareholders use their banks as ATM machines to fund unprofitable pet projects related to themselves). Without the Baoshang event, likely these two banks could have continued to operate for a while. But now investors, seeing the potential risk, refused to buy their NCD. This triggered the rollover risk, greatly amplifying the initial fundamental risk. Because the interbank market is closely connected, a potential systemic risk could have emerged. Beijing at this point decided to bail out and restructure these two banks, by introducing various new strategic investors with fresh capital (other large banks, government related entities, and even foreign holding companies).⁶ Again, I think it is the right move.

⁶ Why let Baoshang fail but bail out the other two during China's NCD market turmoil in 2019? The logic seems to be similar to the US experience of letting Lehman fail but bailing out AIG during the 2008 financial crisis. Size-wise, Baoshang is smaller (with an asset of 0.4 billion RMB in 2017) while Jinzhou and Hengfeng are bigger (0.8 billion RMB

NCD Market Going Forward

To answer this question, let me first mention one particular thing that PBOC has done during this turmoil. In helping Bank of Jinzhou to issue its NCD, the PBOC provided an explicit guarantee—by selling Credit Risk Mitigation Warrants (CRMW), which are similar to Credit Default Swaps (CDS)—on June 10th, 2019. This is the only case so far in which the central bank to step in the NCD market acting as the lender of last resort for troubled regional banks, although in January 2020 another smaller lender (Shanghai Huarui Bank) was reported to have failed in an attempt to seek help from PBOC.

Through these decisions, the PBOC told the market that it reserves full discretion on the timing as well as the place to intervene. It signaled to the market that it has the ability to stop the vicious liquidity cycle when it is necessary. Any responsible central bank faces a tough balance between maintaining market discipline and curtailing systemic risk, and the PBOC is no exception.

The turmoil in the NCD market emerged together with the recent surge of corporate bond defaults in China. This is not coincidence; financial markets merely reflect the slowdown of the Chinese economy as well as the unfavorable international environment. These default incidences naturally triggered a demand from market participants to hedge the credit risk, and going forward I expect a fast growing credit risk market (with products like CDS or CRMW) in China's corporate bond market.

The systemic risks unearthed by these bailouts are unlikely to change the funding model of China's financial institutions. Without any political regime shift, international experience tells us that market-based financial market development/reform is a one-way street. Led by the PBOC, one of the most market-driven government agencies in China, the interbank market today hosts a variety of financial institutions thanks to its sophisticated multi-layer structure. In many ways, China's interbank market resembles many modern interbank markets in developed countries, though there is still a long way to go to establish some genuine "price mechanisms" like those of its international peers.

More broadly, I believe that Beijing's recent effort to streamline and tighten regulations in the ever-complicated Chinese financial market is well justified. The recent surge in corporate bond defaults is a great opportunity for the Chinese financial market. Yes, it is painful in the short-run; but a transparent regulatory environment is paramount for building a healthy and sophisticated financial market in a modern financial system where market participants fully understand the risks and the consequences of their own decisions, including issuance, underwriting, trading, and investment.

5. In what ways does the structural imbalance in the fiscal transfer relationship between central and local governments inform local governments' capital raising needs?

1994 Tax Reform

The 1994 tax reform underlies the structural imbalance in the fiscal transfer relationship between central and local governments. In essence, the 1994 tax reform ensures the central government directly controlled half or more of those revenues, hoping stronger central oversight would help

and 1.3 billion RMB, respectively). Another relevant factor is that Baoshang's effective controlling shareholder was Tomorrow Holding Group, a conglomerate that is currently under graft investigation.

increase overall tax revenue. As an example, for the most important tax, value-added tax (VAT), the central government got 75% while the local got 25%. As importantly, the 1994 tax reform also banned local governments from borrowing (as explained later, this restriction was lifted in the 2014 tax reform).

The 1994 tax reform left local governments with significant operating deficits, as localities were assigned a minority of revenues but still a majority of expenditures. Here, expenditures include all sorts of public goods offerings (e.g., education and infrastructure). The left panel in Figure 5 shows local government revenue and expenditure as a fraction of the corresponding national level, starting in 1980. The noticeable structural break occurred in 1994; since then, local governments have always spent more than their revenues, and have run up even greater deficits in recent years. In principle, localities could balance their budgets by receiving transfers from Beijing. However, the transfer system worked poorly in practice, and localities felt immense pressure to raise extra revenues to cover the shortfalls.

Localities then turned to land. To get around the formal prohibition on local government borrowing, cities usually transferred land assets into special-purpose companies, so-called “local government financing vehicles” (LGFVs). Using the land as collateral, these local SOEs borrowed from banks and later repaid loans by selling the land, thanks to the housing reform and the skyrocketing land values that resulted during the early 2000s.

The 2009 Stimulus Plan and the 2014 Tax Reform

The fiscal imbalance between central and local governments and the unique land-based financing model were pushed to the center stage when Beijing rolled out its 2009 four-trillion RMB stimulus package in response to the 2007/08 global financial crisis. LGFVs borrowed aggressively from not only traditional banks but also shadow banking, especially after the credit tightening in mid-2010. Since then, the steadily rising local government debt has been increasingly alarming, and hence closely monitored by top policymakers in Beijing.

The tax reform in 2014 was Beijing’s major initiative to tackle the local government debt problem. I highlight four points below, with my own assessment of each reform effort.

- i. LGFVs are banned from new borrowing. (Though, this policy faced fierce resistance from localities, and as a result was never seriously implemented. In fact, LGFVs’ borrowing has continued to grow in the past five years.)
 - ii. Introducing municipal bonds, including the general bonds and special-purpose bonds. These bonds are structured to replace banks loans, which were the major financing instrument of local governments since the 1994 tax reform. (See more detailed explanation in Q6.)
 - iii. Returning some responsibility (e.g., education, healthcare, and some social welfare programs) back to the central government. (This has been implemented.)
 - iv. Improving the accountability of local governments by establishing a better and more transparent reporting system. (Mixed reform outcomes so far, and hard to evaluate.)
6. What factors are pushing local governments to increase issuance of sub-sovereign and local bonds? What are local governments doing with the capital that is raised from this bond issuance?

Recently, China has accelerated the issuance pace of municipal bonds (general municipal bonds and special-purpose municipal bonds) in response to the sluggish economy. The right panel in

Figure 5 plots the annual issuances of municipal bonds in the last two years. As a counter-cyclical fiscal policy, this is in the similar spirit as the four-trillion RMB stimulus plan in 2009 in the wake of global financial crisis in 2007/08. However, there are several key differences from the last stimulus plan, and these differences answer the questions raised above.

General Municipal Bonds and Bond Swap Program

In 2019, about 40% of issued municipal bonds were “general” bonds, which are supposed to help local governments finance broader government spending (and are formally backed by tax revenues).

As explained in Q5, LGFVs played a critical role in the 2009 stimulus program. As a major new policy stipulated in the fiscal reform of 2014, Beijing allowed local governments to sell “official” general municipal bonds to the financial market to repay the maturing MCB sold by LGFVs in years past. This explains a significant part (more than 80%) of issuance of general municipal bonds in the past two years.

Special-Purpose Municipal Bonds

The majority of municipal bonds are “special-purpose” bonds, which finance specific infrastructure-related projects. They accounted for about 60% of the municipal bonds issued by Chinese local governments in 2019.

Special-purpose bonds correspond to so-called “revenue bonds” in the United States, as the cash flows generated from the underlying projects will be used as the primary repayment sources. Special-purpose bonds have been vigorously promoted by Beijing in recent years to boost economic growth, and they have financed infrastructure-related projects, including land banks, shanty town renovation programs, medical care and nursing homes, environmental and ecological protection projects, toll road and metro construction, and even electricity/gas projects.⁷ Here, “land banks” refer to the “primary land development” infrastructure projects on undeveloped rural lands, a necessary step before these lands are ready to be sold to real estate developers. Localities can also issue special-purpose bonds to refinance their maturing debts that funded some qualified infrastructure projects in the past. Figure 6 shows categories of projects that support the special-purpose bonds issued in 2019, based on their issuance prospectus.

Special-purpose bonds work quite differently in this round of stimulus compared to how they worked in 2009. First, in the 2009 stimulus plan, local governments were encouraged to launch any “infrastructure” projects without being monitored by state-level agencies. Consequently, some local governments invested heavily in some other non-infrastructure “business” projects (e.g., establishing some high-tech zones that host private businesses). Second, in 2009, these projects were mostly funded by bank loans, which were extended by all kinds of commercial banks with their own corporate governance issues. Third, LGFVs borrowed heavily from shadow banking several years after the 2009 stimulus plan, due to mounting refinancing pressures.⁸

⁷ For instance, in a detailed project by Zhejiang Province mentioned in China Daily dated 3/28/2019 that “proceeds from the sales will be used for land banks (300 million yuan) and shantytown renovations (1.1 billion yuan).” <http://www.chinadaily.com.cn/a/201903/28/WS5c9c04cea3104842260b2f6c.html>.

⁸ Chen, Zhuo, Zhiguo He, and Chun Liu, 2020, The Financing of Local Government in China: Stimulus Loan Wanes and Bank Loan Waxes, forthcoming in *Journal of Financial Economics*.

Special-purpose bonds are proposed as a solution, as they represent a transparent way to fund grand infrastructure plans, putting an end to the off-balance sheet borrowing by China's local governments. The Ministry of Finance and the National Development and Reform Commission are the two key regulatory and supervisory agencies who are responsible for special-purpose bonds. Particularly, the regulators set a quota each year, which gives the maximum total special-purpose bonds that Chinese local governments are allowed to issue. To apply for the permission to issue special-purpose bonds, every local government needs to submit detailed descriptions of the projects—e.g., the project budget and completion years, and then wait for approval from the National Development and Reform Commission. Finally, after approval, the interbank market requires local governments to disclose these detailed project descriptions in the corresponding bond issuance prospectuses.

In recent months, Beijing has responded to the economic slowdown with various relaxation measures, a trend that I expect to keep its momentum in the coming year. First, China has brought forward 1 trillion RMB (\$142.07 billion) of the 2020 local government special-bonds quota to 2019. In the meantime, the National Development and Reform Commission expedited the application procedure for special-purpose bonds.⁹

7. In addition to exchange rate management, in what ways do foreign exchange reserves act as a backstop for China's economy? How has Beijing deployed its reserves to solve economic problems and what are the challenges to doing so?

Foreign Reserve as a Backstop for China's Economy?

Although foreign exchange reserves have played an instrumental role in shaping China's growth starting in the 1990's, today the phrase "foreign exchange reserves act as a backstop for China's economy" is misleading to a large extent.

In principal, China does not need to rely on foreign reserves for its economic growth, thanks to its vast size, increasingly balanced growth of industry sectors, moderate current account surplus, and most crucially, its tightly controlled capital account.

Let me elaborate on this point by citing a set of widely accepted IMF tests which assess the adequacy of a country's foreign exchange reserve. The tests look at four economic variables: (i) export income to reflect the potential external demand shock; (ii) broad money to capture potential residents' capital flight; (iii) short-term debt to reflect debt rollover risks; and, (iv) other liabilities to reflect other portfolio outflows.¹⁰

Because China has a fairly small amount of foreign-denominated external debt, the only test that China fails is ii), which requires a country to have foreign reserve that exceeds 20% of its money supply (say M2). For China, at the end of 2018, the ratio between its foreign reserves and its M2 is about 11%.

⁹ According to a *Financial Times* article published on Nov 25th, 2019, a local government financing entity in Jiangxi province in eastern China said that "All we need now is to fill out a few forms and within a few weeks the National Development and Reform Commission will give us the green light." <https://www.ft.com/content/543a6d40-07b2-11ea-a984-fbbacad9e7dd>

¹⁰ Guidance Note on the Assessment of Reserve Adequacy and Related Considerations, IMF staff and completed on June 2, 2016. <https://www.imf.org/external/np/pp/eng/2016/060316.pdf>.

However, the same IMF paper emphasizes that the ratio of reserves to broad money only applies to countries with open capital accounts that have significant capital flight risks. With tightly controlled capital accounts, the capital flight risk is minimal—note, China has been very effective in dealing with capital flight risk in 2017.

Why Is Foreign Reserve Still Important for China?

Although not the “backstop” for the domestic economy, foreign reserve is still vital for Beijing in implementing its economic and financial policy at the international stage.

The first usage of foreign reserve, which is also perhaps the most direct one, is to repay USD-denominated loans or bonds if Chinese borrowing firms face difficulties in refinancing their debt. Another equally plausible situation is that these borrowing firms decide to pay back maturing USD-denominated debt, perhaps due to unfavorable expected exchange rate movement, just like what happened in 2016. At the end of 2018, outstanding foreign-currency denominated bonds (loan data are unavailable) amounted to about 848 billion USD, which was about only 27% of China’s reserve (3.1 trillion USD). This is consistent with the fact that China—including both the public and private sectors—does not have heavy foreign-denominated borrowings.

Second, China’s ample foreign reserve gives Beijing a fair amount of flexibility in pushing the One-Belt-One-Road Initiative. Foreign reserves allow China to not only invest directly in infrastructure projects in other central Asia countries, but also establish various market-oriented financial institutions that pursue the One-Belt-One-Road Initiative. A non-exclusive list of these entities include the Silk Road Fund, Asian Infrastructure and Investment Bank, and New Development Bank (formerly referred to as the BRICS Development Bank). Beijing has committed some non-trivial seed capital to these entities, hoping to attract capital injection from other partner countries. According to publically available information, the total capital commitment for these three entities from China are about 40 billion USD. This seems to be minuscule relative to China’s foreign reserves, with the caveat that we lack reliable data on other One-Belt-One-Road initiative projects.

The above two roles served by China’s foreign reserves are naturally linked to Beijing’s ambition to internationalize the RMB. Internationalization of RMB requires China to open its domestic bond market, and USD-denominated Chinese corporate bonds help foreign investors get familiar with China’s economic environment. For the One-Belt-One-Road Initiative, Beijing has been trying hard to sign the investment contracts in terms of RMB. Last—but perhaps the most important—China’s ample foreign reserves help Beijing to manage a stable exchange rate of RMB against USD, which is the very backbone of the internationalization of RMB.

To sum up, I do not think that in today’s China “foreign exchange reserves act as a backstop for China’s economy.” Nevertheless, it could be viewed that foreign exchange reserves act as a backstop for RMB internationalization.

8. Conclusion: How would China’s management of its financial challenges in the wake of economic slowdown impact the United States or other world economies?

For the US and global economies, a potential severe recession in China will be quite damaging today, especially given the sluggish Euro-zone economy and heightened geo-political tension around the world. While slowdown is a sure thing to embrace, top policymakers in China have all

the determination, together with various new tools thanks to its burgeoning financial market mentioned above, to prevent the China's economy from a complete collapse.

Can Beijing do it without reversing some past positive market and financial reform efforts, especially those that are essential for its long-term growth (e.g., deleveraging, cracking down shadow banking)? And are there other issues for which global investors will be affected by China's financial market reform? Here are the list of important points for these questions.

- i. Almost all the current economic and financial challenges that Beijing is battling are about internal issues (except the US-China trade conflict, with a recent phase-one deal giving both sides a temporary relief). China's domestic economy, thanks to its vastness and sophistication, is on its own track. A free-falling economy is impossible, given the presence of a powerful central government that already puts financial systemic risk at the top of its watch-list.
- ii. Nobody, not even the top policymakers in Beijing, is expecting China to grow like how it did in the past thirty years. It is a gigantic economy already, and the slogan of "New Normal" just means slower and better growth. And, it seems that Beijing has learned to adjust its policy-making style facing the new normal economic situation, as it relies on increasingly more market-driven tools when tackling its economic challenges. As mentioned in Q3, Beijing prefers to utilize the existing market infrastructure—admittedly still underdeveloped—to implements its policy goals. Equally interesting, in setting China's 14th five-year plan, policymakers even debated whether it should include some pre-specified GDP target for the years to come.
- iii. Another relevant issue is that of China's recent commitment to opening its domestic financial market to foreign financial investors/institutions.
 - a. In my view, various connect programs that link Chinese exchanges with Hong Kong exchanges are the most exciting financial innovations in recent years. These allow both domestic and international investors to enjoy the benefit of diversification without changing the regime of closed capital accounts, a perfect example of reform gradualism of which Beijing has been quite proud.
 - b. Foreign institutions now are allowed to set up sole-owned entities or joint ventures with control (above 50%) that operate in China's domestic financial industry (e.g., card clearing and payment, asset management, and distress debt businesses mentioned in the newly-signed first phase of US-China trade agreement). From China's perspective, many key managers in domestic big financial houses had extensive working experience in internationally renowned funds, and I think it is the right time to expose domestic financial institutions to foreign competition. From the perspective of international players, China's asset management industry is undergoing a complete revamp after the tightening of shadow-banking regulation, hence offering a great opportunity that it cannot afford to miss.

Appendix.

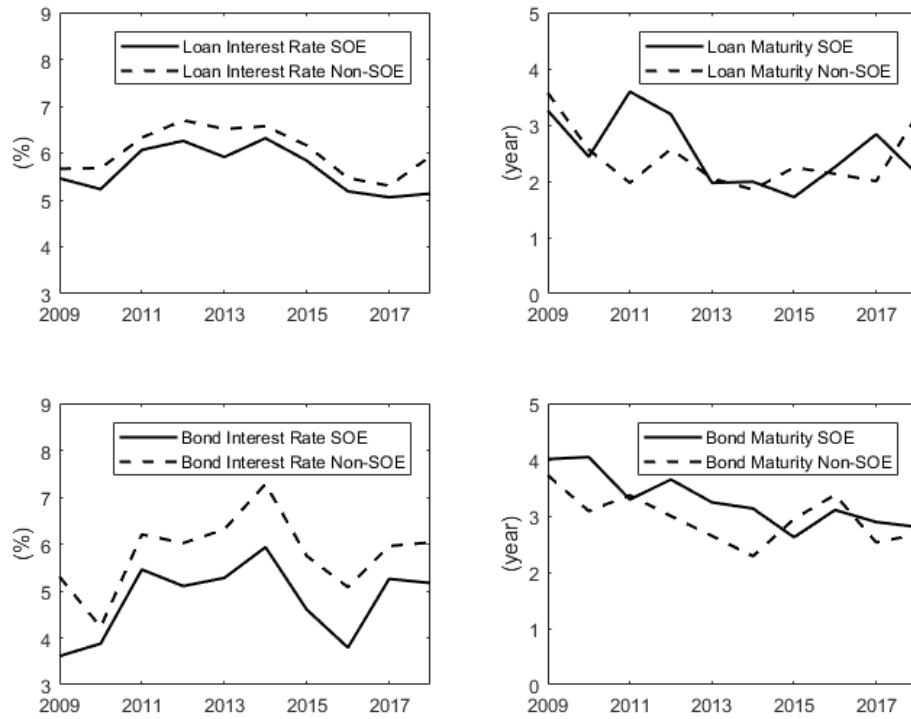


Figure 1. Interest rate and maturity for bank loans in Listed SOEs & Listed Non-SOEs (top two panels), and for corporate bonds in SOEs & Non-SOEs (bottom two panels). Data Source: CSMAR, WIND

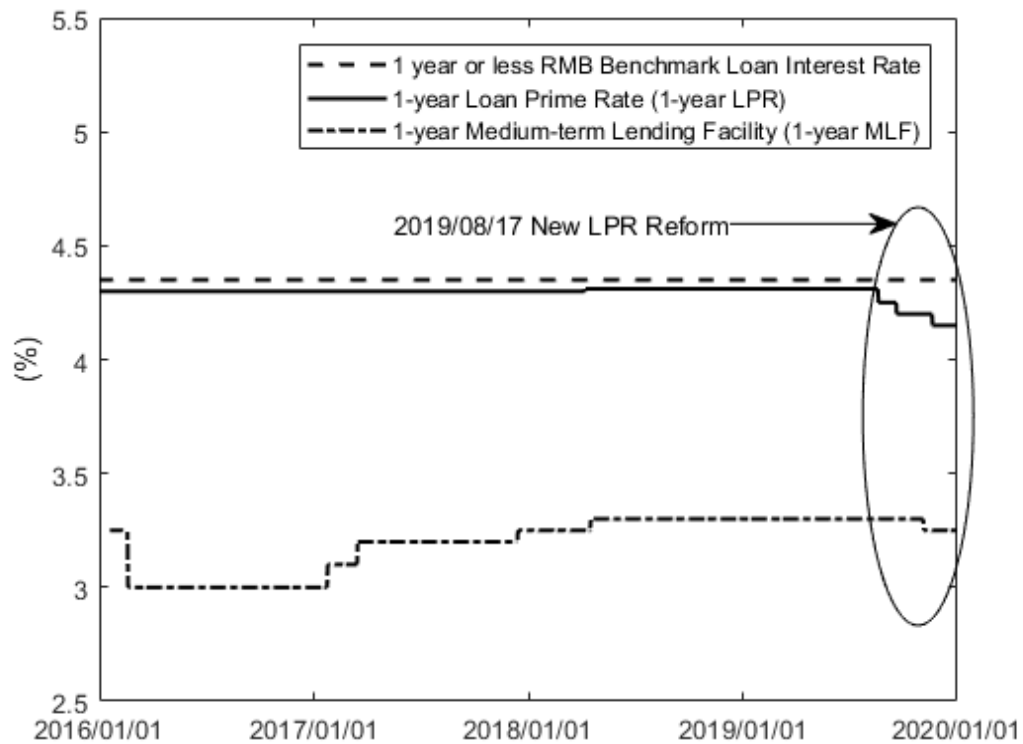


Figure 2. 1-year RMB Benchmark Loan Interest Rate, 1-year LPR and 1-year MLF in China. Data Source: WIND

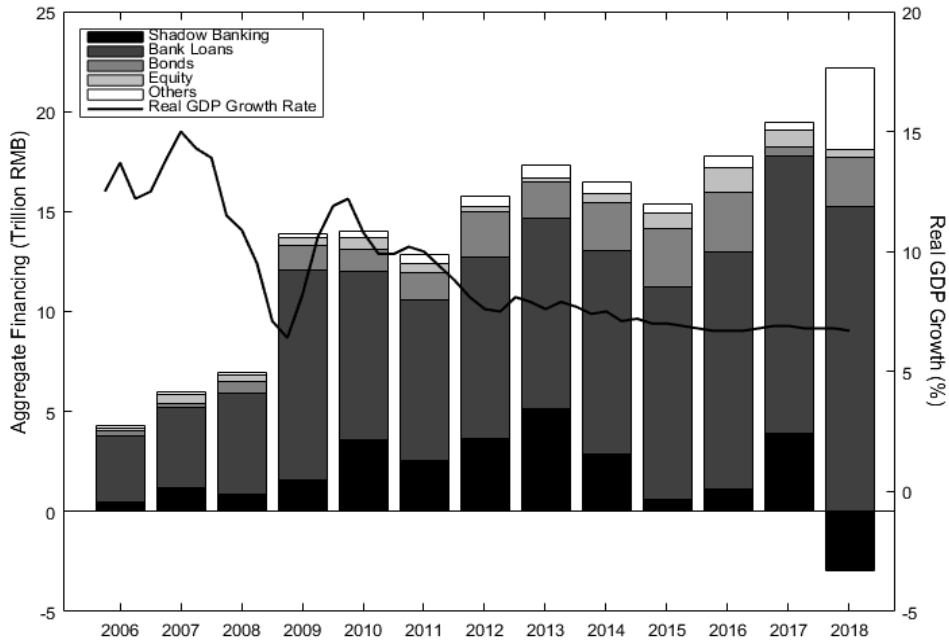


Figure 3. GDP Growth and Aggregate Financing to the Real Economy (Increment) in China. Data Source: WIND. “Others” in 2018 include financing from special-purpose municipal bonds and loan write-offs, both of which were not part of Aggregate Financing before 2018.

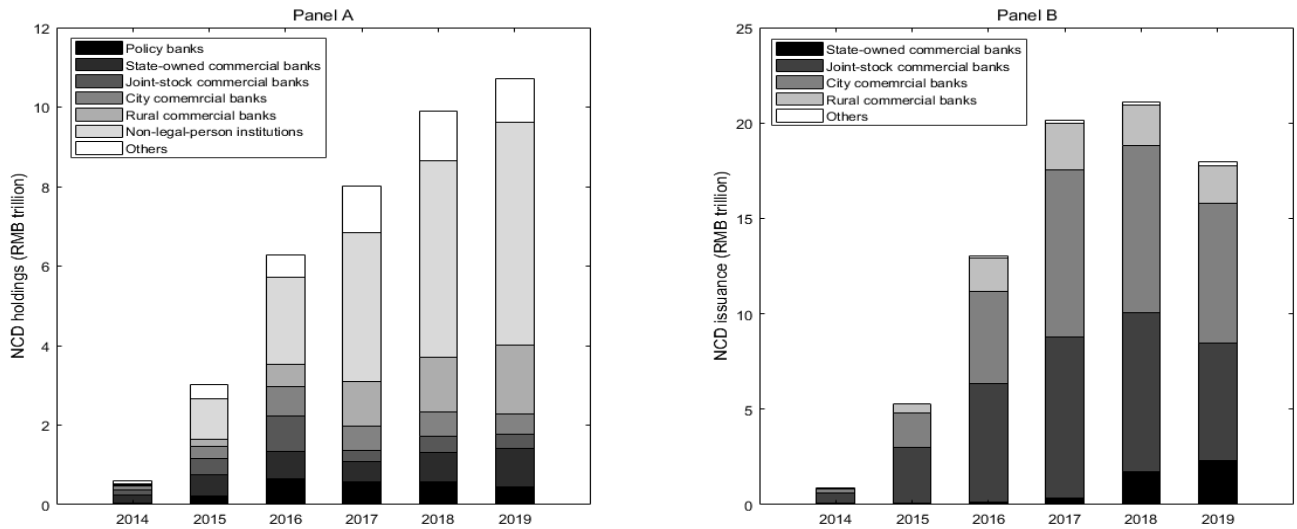


Figure 4 NCD Holdings by investor types and NCD Issuance by institution types, from 2014-2019. Data Source: WIND.

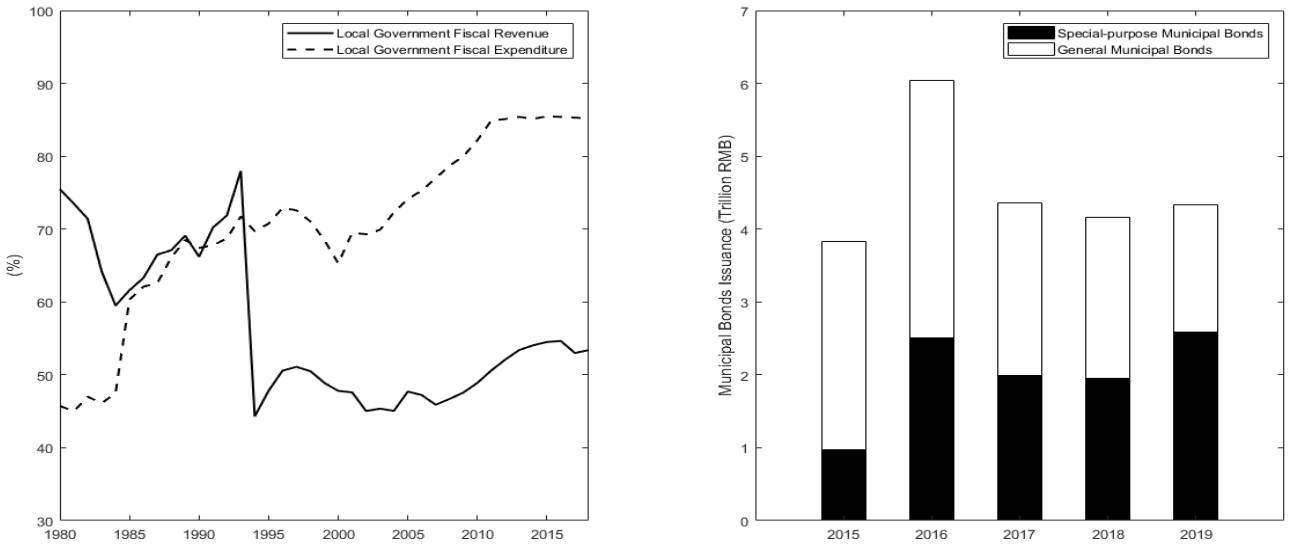


Figure 5. China’s local government share of fiscal revenue & expenditure (left panel) since 1980, and municipal bonds issuance (right panel) since 2015. Data Source: WIND, RoyalFlush.

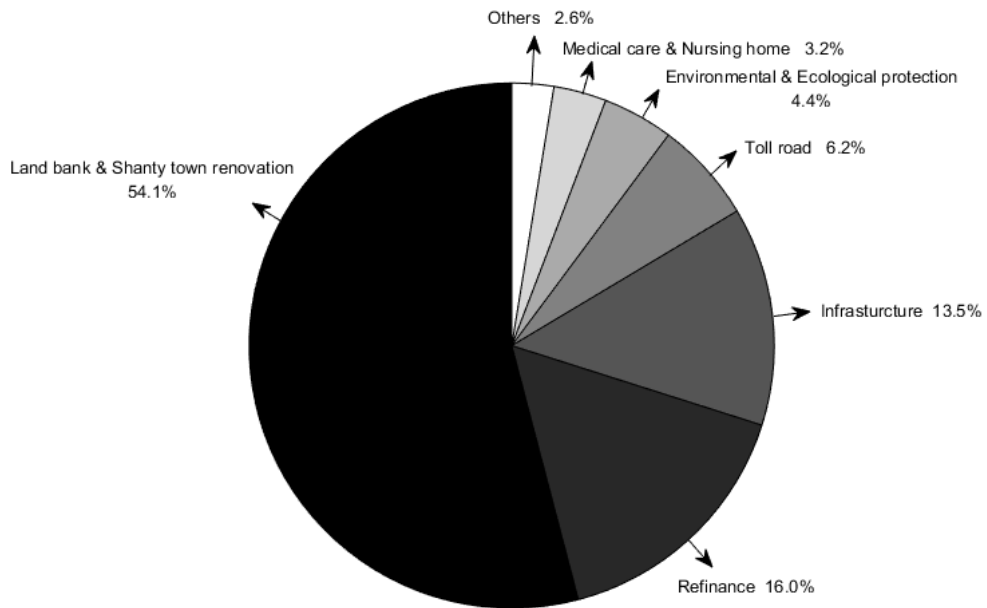


Figure 6. Categories of infrastructure projects that support special-purpose municipal bonds in 2019. Data Source: WIND and bond issuance prospectus.