

Market-Based Interest Rate Reform in China

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Research Group

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PREFACE

Market-based interest rate reform, one of the key areas of China's financial reforms, has consistently been the focus of academic research and policy studies. The reform has sparked numerous debates and analyses over the last few decades.

Discussions and studies on China's interest rate reform have gone through several stages. In the early stage of the reform and opening-up, research on interest rate reform focused on its necessity, prerequisite and path selection. After the country joined the WTO, researchers analyzed the reform on the basis of the possible impact of WTO accession and the poor performance of the nation's banking system. Some studies also looked into the risks of interest rate reform. During the global financial crisis, when China's economic imbalance was becoming a noticeable problem, many argued that the structural imbalance was caused by interest rate controls and the low interest rate policy, and several studies called for the liberalization of interest rates. In recent years, with the financial reform making progress, China is moving into a critical stage of liberalizing its deposit and lending interest rates. Heated discussions have taken place on furthering interest rate reform, the relationship between interest rate liberalization and financial openness, as well as the influence of liberalized deposit and lending rates on the banking system, the financial sector, economic development and SME financing. Meanwhile, the interest rate adjustment mechanism is becoming an important subject.

Current research has reached a broad consensus on the necessity, prerequisite, path selection, risk and influence of the market-based interest rate reform, and many of the findings are mutually verifiable and complementary. However, evaluations of the reform

process vary greatly. One school of thought holds that China's interest rate reform lags behind economic development. Nicholas Lardy (2013) argues that the long time control on interest rates has led to low real deposit rates. Particularly after 2004, the low rate policy has severely hampered the increase of income and consumption and led to an imbalance in economic growth; low interest rates, Lardy says, have also led to excess demand for bank credit, forcing the People's Bank of China (PBOC) to take quantity control measures. However, such arguments are challenged by others, as evidence shows that China's consumption rate has been underestimated, and that low interest rate policies have benefited the banking sector and the consumers (Yi, 2013). Some argue that it is unreasonable to claim that China's financial system is a failure when the country's economic reform and development is a widely acknowledged success (Xia, 2011). Basically, the past reforms of the financial system have not impeded China's economic growth (Perkins and Rawski, 2007).

Opinions also differ on the next step of interest rate reform, and disagreements mainly center on how to further loosen up interest rate controls and expand the areas for market-set prices. Opinions can be categorized into three camps: First is the indirect approach, which suggests pushing forward the interest rate reform by improving external conditions, such as developing direct financing to encourage competition in the financial market; developing the money market as the core market of the financial system to form short-term benchmark rates; developing shadow banking to create market-based interest rates through various financing channels (Wang, 2014).

The second is the direct approach, which recommends that the PBOC gradually remove

the upper limit of deposit rates and the lower limit of loan rates. This method believes that forcing interest rate reform by fostering external conditions when bank interest rates are regulated will push up risks in the banking sector. The crisis in the U.S. banking system in the 1980s is an example. The direct approach proposes that the reform should be gradual and be coordinated with comprehensive measures to balance inflation expectation and assisted by credit regulations (Lu, 2010). Former IMF resident representative in China Tarhan Feyzioğlu with others (2009) argue that China should remove the upper limit of deposit rates and suggest that long-term, large deposit rates should be liberalized before short-term small deposit rates. Jun Ma (2010) argues that deposit rates could be targeted in the short run, gradually removing the upper limit of rates on long-term deposits and then on short-term deposits. For example, the central bank can first allow the two-year or longer-term deposit rates to rise 20% above the benchmark, the three-month to one-year rates to increase 10% above the benchmark while leaving the rates of current deposit unchanged. Current deposit account for 50% of total deposit, and a change in its rates is likely to bring unpredictable changes. In the medium to long run, further actions will depend on the feedback of banks and enterprises.

The third method is the integrated approach. Ruoyu Li (2013) suggests that future interest rate reform should include the following: 1. Prudently pushing forward the reform of deposit rates and completely liberalizing deposit rates in five years; 2. Improving the benchmark rate system; 3. Establishing targeted policy rates and the basic framework for interest rate adjustment, and 4. Improving the complementary policies.

Further research is needed to evaluate and push forward China's interest rate reform. An

accurate evaluation of past reforms is crucial as it will influence the direction of future reforms.

It should be noted that China's interest rate reform took place against the backdrop of the country's economic reforms and the thriving domestic economy and financial sector. Interest rate reform not only constitutes a key step in constructing the socialist market economy, but also reflects the achievement of China's economic reform and development. In the past 30 years, the nation has been exploring a path of reform and development with Chinese characteristics. The interest rate reform also bears these characteristics. Different from the reforms in developed countries that have a relatively mature financial system, China's interest rate reform is being carried out in a constantly evolving economic and financial environment that has just transformed from a planned economy.

Different from the shock therapy adopted by former Soviet Union and Eastern European countries, China is taking the approach of gradual reform. It starts from the easy parts and moves to the hard bones, from separate sectors to the whole system and from the surface to the root. Interest rate reform as an important part of comprehensive reforms should be considered and pushed forward along with reforms in other areas. Moreover, the various aspects of the reform should be gradual and coordinated. Therefore China's interest rate reform should be viewed as part of the country's overall reforms and the dynamic economic development. This research aims to analyze the background and evolution of China's interest rate reform from a historical perspective in order to facilitate a better understanding of the process.

If we take into account other nations' experience and theories on interest rate reform as

well as China's economic and financial condition, the country's reform emphasizes steady progress. It aims to first liberalize the interest rates in the money market and bond market and then move to reform the deposit and loan rates. Liberalization of deposit/loan rates will be carried out in a gradual manner - from foreign currency to domestic currency; from loans to deposits; from long-term, large loan/deposit to short-term, small loan/deposit. The PBOC has gradually loosened the control on interest rates to push forward the liberalization process. At the same time, it is also set on improving the market interest rate system and establishing an adjustment mechanism.

With the development of diversified financial institutions and the increase in commercial banks' autonomy, the interbank financial market has developed substantially. From 1996 to 1999, the interbank rates had been mostly liberalized. In the new century, reforms of state-owned commercial banks and state-owned enterprises (SOEs) focusing on improving corporate governance has laid a solid foundation for the liberalization of deposit/loan rates on the micro level. And China's entry into the WTO and the ensuing economic growth created a good environment for interest rate reform on the macro level. In October 2004, China achieved the goal of reserving only a lower limit on loan rates and an upper limit on deposit rates. After that, the PBOC focused on developing the pricing ability of financial institutions by strengthening their pricing mechanisms. With the development of the interbank bond market since 2005, the PBOC set up the Shanghai Interbank Offered Rate (Shibor) in 2007 to build a better environment for interest rate reform.

In recent years, with the rapid development of financial innovation and financial

disintermediation as well as the transformation of the economic structure, China's economy and financial markets have undergone fundamental changes. Determination of interest rates by market forces has become not only a goal of policy makers, but also a demand and a reality. In response to market trends, the lower limit of loan rates was loosened up and eventually removed, and the upper limit of deposit rates has been eased as well.

To meet the demand of China's economic and financial transformation, the 3rd Plenum of the 18th CPCCC reached a decision to comprehensively deepen reforms. The principle for interest rate reform has changed from steady progress to speeding up the market-oriented reform. On October 24th 2015, the PBOC removed the upper limit of deposit rates imposed on commercial banks and rural cooperative financial institutions, which signaled the removal of control on interest rates. However, interest rate reform is a complicated and systemic project, and does not end with the liberalization of deposit rates. Besides, apart from liberalizing interest rates, the reform also aims to develop the benchmark rate system, establish market-based interest rate adjustment and transmission mechanisms, improve the deposit insurance system and develop tools to manage interest rate risks. As a result, in the 12th Five-Year Plan for the Development and Reform of the Finance Industry, interest rate reform was given priority, and the principle for the reform was set as "loosening rate controls, establishing market-based interest rates and building an effective adjustment mechanism", which also set the tone for current and future reform measures.

Based on this principle, this study offers a systemic review of the achievements and

weakness of China's interest rate reform, analyzes the challenges and proposes some policy advice. The key to accelerating the interest rate reform is to apply concentrated efforts in tackling the obstacles and limitations in the liberalization process. Whether China can successfully achieve its goals is highly dependent on the condition of the market and the economic and financial environment. As stated above, the interest rate reform has been carried out against the backdrop of the progressive reforms and development of China's economy and the financial sector. When evaluating past reforms and planning for the future, we need to take into consideration this background. Based on this, this research conducts a systemic review of the characteristics and the progress of the interest rate reform, discusses the problems and challenges faced by the process, and offers a set of comprehensive policy suggestions.

The book is divided into six chapters. In response to loosening the control, chapter 1 looks back at the history of deregulating interest rates, and analyzes the rationale, path and characteristics of China's interest rate reform by referring to international practices. In terms of establishing the market-based interest rate system, chapter 2 focuses on how China strengthens the market-based interest rate formation mechanism by elaborating on the characteristics and performance of the dual-track system and analyzing the transmission of interest rates. In terms of developing the adjustment mechanism, chapter 3 reviews the adjustment of interest rates and analyzes the necessity, environment and conditions of strengthening the central bank's adjustment mechanism, and summarizes the experience with interest rate adjustment of major countries. Based on that, the chapter further proposes policy suggestions on how to improve the PBOC's adjustment mechanism. Chapter 4 goes on to analyze the impact that different economic and

financial development stages have on the interest rate reform. Chapter 5 analyzes the relationships between the interest rate reform and a number of crucial issues, including budget constraint on microeconomic entities, degree of competition in the banking sector, the bankruptcy system, financial regulation, exchange rate formation mechanism and capital account liberalization. Chapter 6 reviews past reforms and looks ahead at the future process.

It should be noted that this study was completed in October 2015 when the cap on deposit rates had not been lifted. The liberalization of deposit rates marks a milestone in China's interest rate reform. This book can be seen as a summary and an analysis of the reforms prior to this. Lifting the cap on deposit rates is not the end, but a beginning. The interest rate reform needs to be further pushed forward. We hope that this study can provide some insight for the research and implementation of future reforms.

Chapter 1 Interest Rate Deregulation: China's Path

Relaxing interest rate controls is a key part and an important goal of interest rate liberalization in both the Chinese and global context. Different countries have different approaches to interest rate liberalization; some liberalize the interest rate quickly while others do it gradually after taking certain steps. China has adopted a measured approach. After removing controls on its money market rates, bond market rates, and foreign currency deposit and loan rates, it relaxed control of lending rates in July 2013 and lifted the cap on deposit rates in October 2015. Therefore, China has basically removed regulation on interest rates, marking an important milestone in the process of market-based interest rate reform. This chapter provides a comprehensive and systematic review of China's practice in relaxing interest rate controls to provide an understanding of the principles, approach, sequence, and pace of the reform measures.

I. Path Selection of Interest Rate Deregulation: Theoretical Basis and International Experiences

A. Theoretical analysis: Regulation and liberalization of interest rates

Judging from a historical perspective, most countries have undergone “free-controlled-free” stages in their interest rate systems. This process is a reflection of the development of economic theory. Before the 1930s, the “laissez-faire” theory was

playing a dominant role and most nations did not regulate interest rates. For instance, the U.S. embraced a free banking system before the establishment of the Federal Reserve System in 1913. And from then until the Great Depression, the U.S. government and the Federal Reserve did not intervene strongly in the financial market, and interest rates were decided by supply and demand. The Great Depression from 1929 to 1933 weakened the dominance of the free market theory and Keynesianism became the mainstream. Many countries began to emphasize the importance of the government's role in economic activities, and the interest rate regulation became a crucial part of government intervention. The U.S. passed Regulation Q in 1933, which prohibited banks from paying interest on demand deposits and imposed maximum interest rates on savings and fixed deposit. Germany started to regulate interest rates in 1932 and continued to do so long after the Second World War; France imposed regulations on deposit and lending rates during the war and strengthened credit regulation afterward to boost economic growth, with the State Credit Commission setting the maximum interest rates of bank deposit and loans and keeping the rates at a low level; Japan in 1947 imposed regulation on deposit rates, short-term lending rates, long-term loan preferential interest rates and bond issuance interest rates. However, many western countries experienced stagflation in the 1970s and Keynesianism began to be challenged. Liberal thinking represented by neoclassical economics became popular, and some major nations started to relax control on the economy with liberalizing interest rates as the main focus.

From the perspective of financial theory, the term financial deepening coined by Ronald McKinnon and Edward Shaw laid the foundation for interest rate liberalization. McKinnon and Shaw felt that interest rate and credit regulation were restraining financial

development in developing countries. The low interest rate was leading to low savings and the government was forced to conduct credit allocation due to strong investment demand. This reduced accumulation of capital led to misallocation of financial resources, and affected the channeling of savings to investment, hindered economic growth, and eventually resulted in a vicious cycle of financial repression and economic distress. In developing countries, money and physical capital are to a large extent complementary rather than substitutional as suggested by traditional theory, and the real interest rate is to a degree in positive correlation with savings and investment. Therefore, developing countries should reduce intervention in the financial system and remove regulation of the interest rate to let it reflect the real supply and demand of capital in the market, increase the interest rate to an equilibrium level, and allow the financial system to be the intermediary, thus achieving a virtuous cycle between the financial system and economic development. The theory of financial deepening caught widespread attention in academic and policy circles; empirical research on developing countries had confirmed its conclusions. The policy recommendation was adopted by most developing nations.

However, financial liberalization with interest rate reform as the prime focus has caused some countries severe economic and financial problems. The theory of financial restraint brought forward by Thomas Hellmann, Kevin Murdock and Joseph Stiglitz (1997) argues about issues such as moral hazard and adverse selection in the context of information asymmetry. According to them, laissez-faire financial policies often lead to market failure or economic crisis if there's not enough prudential regulation. Therefore, for developing countries with weak market infrastructure, financial repression, a monopolistic financial institutional arrangement set by the government works better than financial liberalization

and a competitive institutional arrangement in terms of financial deepening and economic growth. By implementing financial repression policies, the government can, on the one hand, maintain a positive but lower than equilibrium deposit rate, and reduce the financing cost for banks; on the other hand, the government can put a cap on the lending rate to minimize default risks for borrowers and financing costs for companies, and help boost economic growth.

Though Hellmann, Murdock and Stiglitz (1997) believe that financial restraint is good for developing countries, they do not reject the possibility of liberalization. They further point out that financial restraint is not a static financial instrument. Rather, it should be adjusted as the economy matures. So, the policy options provided by this theory are not a static comparison between laissez-faire and financial restraint, but a dynamic process following financial market development. “The arguments set forth in this paper are not designed to claim that there exists a single optimal level of financial restraint that should be implemented by all governments identically, regardless of the state of financial development. Rather, financial restraint should be a dynamic policy regime, adjusting as the economy develops, and moving in the general direction of freer and more competitive financial markets. The policy trade-off is not a static one between laissez-faire and government intervention; the relevant question is over the proper order of financial market development.”

The comparison of the two theories shows that financial deepening theory points out the necessity of financial liberalization, but fails to take into account the conditions of developing countries and the risks involved in the process, whereas financial restraint

provides a thorough analysis of the conditions and approaches for liberalization and is more in line with the reality of developing nations. In fact, Ronald McKinnon (1991) also proposed the sequence of financial liberalization for developing countries in his book *The Order of Economic Liberalization: Financial Control in the Transition to a Market Economy*.

For reasons such as financial information asymmetry and the particularity of financial conduct, it's debatable if complete financial liberalization is even good for developed countries. Some economists have reflected on the direction of interest rate reform after the recent financial crisis; Professor Amar Bhide, among others, pointed out that it's necessary to put a cap on demand deposit interest rate to reduce excess competition among financial institutions and ensure financial stability. And Stiglitz argued that a well-functioning market economy is in itself neither stable nor effective. He further said that the only time in modern capitalism that did not see reoccurring financial crises was the short period when strong financial regulation was exercised after the Great Depression, and it was also a period when the fruit of economic growth was widely shared. Of course, there are those who argue against Stiglitz.

In short, the various theories on interest rate liberalization reflect different views on the role of market and government in financial resource allocation. The relation between the government and the market is an abiding theme in economic and financial research. With the development of the economy and financial sector, people's understanding is also evolving and deepening, and the views of experts vary. But one thing is certain: The allocation of resources should not be completely handed over to the market, nor be

completely dependent on the government, and the boundary between the market and the government often relies on a lot of factors. Relaxing interest rate controls is inevitable, but there's no absolute truth as to how to do it and how much liberalization should be allowed.

B. International experience: Radical or incremental

Countries all over the world usually choose one of two paths for interest rate liberalization: complete liberalization carried out over a short period or incremental reform.

a. Deregulate interest rates entirely over a short time

Of all the developing countries, Latin American nations are the best examples of this model of liberalization. Argentina in 1975 totally deregulated all interest rates except for the upper limit for the deposit rate, and lifted the cap on the deposit rate in June 1977. Chile started to liberalize interest rates in May 1974 and lifted restrictions on deposit rates by November the same year, and all regulations by April the next year. However, since these nations had less developed financial systems, poor corporate governance and insufficient supervision, this led to moral hazard in the banking sector. The nominal interest rate and inflation rose, real interest rate began experiencing volatility and bad loans increased. The governments were forced to intervene. Argentina set the upper limit back for deposit rate and Chile halted liberalization by releasing guiding rates.

The former Soviet Union and Eastern European countries adopted the same model under the shock therapy prescribed by the west. Russia initiated reform on interest rates in 1993

and finished it in 1995. The process improved the interest rate transmission mechanism, but it was so radical that the other aspects of the system couldn't keep up. The stability of the financial system was adversely affected.

Developed countries such as the U.K., Germany and other European nations also deregulated their interest rates over a short time. The Federal Republic of Germany removed restrictions on interest rates of fixed deposit longer than two and a half years in March 1965, and restrictions on interest rates of large deposit of more than one million Deutsche Marks and longer than three and a half months in July 1966. The government rolled out a liberalization plan in February 1967 and completely let go of control of interest rates in April the same year. But the government kept its guidance on the deposit and lending rates of financial institutions until October 1973.

The Bank of England abolished the regulation on interbank deposit and lending rates in one go in September 1971, allowing financial institutions to decide their own interest rates. But due to the pressure of high inflation, economic recession and a weak currency, the central bank forbade banks to pay an interest rate above 9.5% on deposits of less than 10,000 pounds in September 1973, which lasted until February 1975. To control short-term interest rates, it announced the lowest loans rate every week. The U.K. did not achieve full liberalization of interest rates until August 1981.

b. Incremental liberalization

Among developed economies, the U.S., Japan, France and Australia adopted the model of incremental liberalization. The U.S. liberalized interest rates on long-term, large-amount

loans and deposits, and then moved to liberalize rates for short-term, small-amount loans and deposits. Since 1970, the U.S. gradually relaxed regulation on large-denomination negotiable certificates of deposit and fixed deposits. The Depository Institutions Liberalization and Monetary Control Act in 1980 marked the official beginning of interest rate liberalization, and by 1986 the U.S. had basically achieved full liberalization.

Japan's reform followed the sequence of "Treasury bonds first and other categories later, interbank business first and bank customers later, long-term large deposits first and short-term small deposits later". Japan liberalized the issuing rate and trading rate of government bonds from 1975 to 1978. The central bank allowed some flexibility to interbank offered rate in April 1978 and liberalized interbank note rate that June. Meanwhile, it lowered the threshold for fixed deposit interest control and increased the variety and term structure of liberalized fixed deposit. And by April 1991, Japan had basically liberalized fixed deposit rates and by October 1994 demand deposit rates. The liberalization of lending rates went hand in hand with deposit rates.

France lifted the cap on the rates of fixed deposit longer than six years in April 1965 and deregulated rates on deposits over 250,000 francs and with a two-year term in July 1976. The French central bank revised its regulation on deposit rates three times in 1969, 1976, and 1979, and by then all deposit rates had been deregulated except for fixed deposits of less than six months and of less than one year but not over 500,000 francs. According to the 1984 Banking Act, demand deposits were not interest-bearing, and banks were allowed to issue certificates of deposit with independent pricing.

Australia was more cautious about the liberalization of interest rates, but the reformers

took an upper hand after a heated debate. It launched the process in the 1970s and removed regulation on large deposits in 1973. But the authority didn't cede control completely. The Campbell Committee was established in 1979 to study the efficiency of financial regulation and offer policy advice. Ever since 1981, the liberalization of interest rates has been implemented in a measured way against the background of all-rounded financial reforms. From 1981 to 1985, Australia removed the limits on deposit and lending rates, deposit terms, and borrowing amounts one after another, and implemented a public bidding system for short-term treasury issuances in 1979 first and later for long-term treasury issuances in 1982.

Most developing countries adopted the model of incremental liberalization based on their specific conditions. South Korea started to liberalize interest rates in 1981 by first deregulating deposit and lending rates and then interbank rates. Liberalization was basically in place by 1988, but the country's economy was facing downside pressure at that time with rising inflation and interest rates, and the central bank had to provide window guidance on interest rates in 1989. When South Korea restarted the reform in 1991, it followed the order of lending rates first and deposit rates later, long-term large deposits first and short-term small deposits later. And by 1997, it had liberalized most interest rates except for demand deposit rates.

Thailand also followed the sequence of deposit rates first and lending rates later from 1989 to 1992. However, the strong bargaining power of major borrowers pushed the lending rates to fall quickly. To avoid a large gap between the lending rates for major borrowers and other bank customers, the Thai authority required its commercial banks to

announce minimum retail rates in October 1993, and therefore strengthened regulation on lending rates.

As early as 1985, India allowed banks to set interest rates freely with an 8% ceiling for deposits of 15 days to one year, but this rule only lasted for a month. The country restarted liberalization in 1992 and removed restriction for loans above 200,000 rupees in 1994. It's not until July 2010 that India fully liberalized lending rates by removing regulation on small loans less than 200,000 rupees and export credit loans in rupees. In terms of deposit rates, India allowed the rates of deposit above 46 days to fluctuate below a 13% ceiling in 1992, and removed restriction for deposit of more than two years in 1995, deposit of one to two years in 1996, and deposit below one year in 1997. The deposit rate was not fully liberalized until October 25th, 2011.

Taiwan's central bank maintained regulation on commercial banks' deposit and lending rates before 1975 and started to allow a wide floating band for lending rates since then. The authority issued the Essentials of Interest Rate Adjustment to officially start interest rate liberalization. The interest rates of money market instruments would be freely set by market forces; the banks could independently set deposit rates as long as they were below the upper limit set by the monetary authority; the upper and lower limits of lending rates would be reviewed by Interest Rate Review Committee established by major banks and approved by the central bank. From 1984 to 1986, the authority further increased the degree of pricing by the market by expanding the floating band of interest rates and streamlining the categories of deposits and achieved liberalization of interest rates in 1989.

C. The key to path selection of interest rate liberalization: Market-driven or government-dominated

Although decisions regarding interest rate liberalization are made by the government, the decision-making process varies: It could be based on practical conditions or out of some economic ideology. There's great distinction among different countries.

- a. The interest rate liberalization process in developed countries is mostly driven by the market

Though the process of interest rate liberalization in developed countries is to some degree influenced by neoliberalism, it's mainly a product of economic and financial evolution, a choice made by the market with or without the intervention of the government.

In the case of the U.S., with inflation rising in the late 1960s, the rigid Regulation Q often led to negative real interest rates. Regulation Q and the limitation of separation of business lines had put banks at a disadvantage, with development of the securities market, internationalization of financing and investment diversification causing capital flow to non-banking institutions. The development of the euro dollar market also led to the large-scale outflow of dollar deposits. Deposit-taking financial institutions created a large number of financial products to prevent outflows, such as negotiable order of withdrawal (NOW) accounts, automatic transfer service (ATS), TTS and Credit Union Share Draft Account (CUSDA). These new types of products combined deposits and investment, thus breaking the upper limit of interest rates set by Regulation Q. Financial institutions were trying all possible ways to bypass the regulation and were calling for liberalization,

making interest rate liberalization inevitable.

Japan was pushed by domestic and foreign conditions to start interest rate liberalization. In the 1970s, to deal with stagnation and the need to finance fiscal deficits, Japan was forced to remove controls of the rates of Treasury bonds to increase their volume and liquidity. But because of very low real interest rates, other financing channels took away funds from banks. Given this disintermediation process, banks involuntarily decided to support interest rate liberalization. On the other hand, the U.S. and some European countries were actively deregulating their interest rates, leading to higher rates than in Japan which led to capital outflows and large purchase of dollar bonds. With limited foreign investment, Japan's capital account saw huge deficits, and the Japanese yen weakened. An overvalued dollar and undervalued yen created a large trade surplus with the U.S. Pressured by the domestic situation and urged by other countries, Japan finally set out to liberalize its financial sector and open up the market.

Though the U.K. and Germany liberalized the interest rates over a short time, these two countries were also pushed by market forces to reform. For Germany, there were domestic and international factors. The country resumed free convertibility of the Deutsche Mark in 1958 and achieved the liberalization of capital account the next year. The free flow of capital enhanced the influence of other countries' interest rates on the domestic market. The private sector shifted its deposits to the European money market for higher yields, causing large-scale capital outflows. Domestic banks then tried to avoid capital outflows caused by the regulation. With the advantage of their universal banking business model, they were able to offer depositors with other preferential terms, creating

de facto high real interest rates. For instance, banks which also engaged in securities business would sell securities to clients at a low price and then buy them back at a higher price, thus offering higher yields to the clients. Under domestic and external pressure, interest rate liberalization became a foregone conclusion for Germany.

The U.K., one of the oldest capitalist countries, boasts a very developed financial market. Even at times of regulation, its interest rates were considered highly liberalized with rate arrangements among banks as the means for regulation. In the 1960s and 1970s, real interest rates were negative due to rising inflation, making it difficult for monetary policies to reach their goals with the interest rate tool, therefore the authority switched to money supply as the intermediate target. But at the same time, control of the interest rate also weakened the competitive edge of banks, leading to the outflow of bank deposits. At the end of the 1960s, the U.K. loosened the requirements for entering the City of London, foreign banks quickly went in and intensified competition. With increasing international capital flows and an expanding euro dollar market, capital outflows were largely increased and the pound plunged in November 1967. Under such circumstances, the Bank of England brought forward a financial reform plan, and one key component was to let the banks set their own interest rates.

In general, the interest rate liberalization in developed countries was the natural result of financial innovation, development of the securities market, and financial opening-up. The reform was mostly driven by financial innovation of banks for the purpose of bypassing interest rate regulation. When reaching a certain stage, the innovation was legalized by the government, which further pushed forward the process of interest rate liberalization.

b. Radical interest rate liberalization in developing countries mainly led by the government

Before interest rate liberalization, developing countries usually experienced financial repression, such as low deposit and lending rates, credit rationing and repressed development of direct financing. When most developing countries set out to liberalize their interest rates, their financial markets were far less mature than those in the developed economies and monetization was at a very preliminary stage. Though many developing countries, to a degree, were forced to liberalize interest rates due to worsening economic and financial situations, the ideology of financial liberalization and the moves taken by developed nations were the more important driving forces.

In the 1970s, countries ruled by military governments such as Chile, Argentina and Uruguay adopted liberal policies to tackle economic crisis. Chile's military government supported a market economy, free enterprises and private ownership. Argentina's economic reform aimed to decrease and eventually remove state control on prices, the exchange rate, interest rates, rents, and wages. The goal of financial reforms was particularly eye-catching in its grand plan to stabilize and liberalize the economy, including removing restrictions on interest rates and capital flows, removing credit guidance, privatizing state-owned banks and reducing registry barriers for domestic and foreign banks.

Though economic liberalization in Latin American countries was not ideal, neoliberalism, the so-called Washington Consensus, which advocates privatization and liberalization to prevent government failure and raise economic efficiency, was the dominant ideology for

a considerable time in developing nations. It's under the influence of the Washington Consensus and some specific guidelines proposed by western experts that the former Soviet Union and Eastern European countries adopted a radical model of reform, the so-called shock therapy, hoping to see the core system of developed countries take effect overnight.

Take Russia as an example. Around the time of dissolution of the Soviet Union, the drawbacks of the planned economy began to unravel and the situation took a turn for the worse with stagnant economic growth and inflation going out of control. At the beginning of 1992, the Yeltsin government initiated shock therapy: deregulating prices in one go, privatizing state-owned enterprises, and letting go of commercial bank rates all at once. It shows that radical interest rate liberalization was mainly led by the government.

D. The core of path selection: A trade-off between benefit and risk

Theoretically, the liberalization of interest rates has both pros and cons. The reward of interest rate liberalization includes the effective mobilization of savings, relieving financing restraints on enterprises and households, increased capital allocation efficiency and more reasonable income distribution. The cons include greater volatility of interest rates, bigger risks for financial institutions, higher financing cost for enterprises and threats to financial stability. How each country selects its path of interest rate liberalization depends on its assessment of the pros and cons. For example, some countries emphasize how interest rate liberalization can improve efficiency while others worry about the potential risks. This influenced the path selection of different countries.

The experiences of many countries show that interest rate liberalization, particularly the reform of deposit and lending rates, is a double-edged sword. It could help enhance efficiency of financial resource allocation, but also cause great financial risks, and many countries have experienced substantial bank losses and bankruptcies during and after the reform. A World Bank survey found that of the 44 countries that went through interest rate liberalization, almost half underwent a financial crisis during the process.

In the U.S., 14 banks went bankrupt in 1975, and the number rose to 42 in 1982 and 184 in 1987. From 1987 to 1991, on average 200 banks went under. In Argentina, about 15% of financial institutions went through bankruptcy and liquidation during interest rate reform from 1980 to 1983. Chile's banking system was hit hard, with eight financial institutions suffering bankruptcy and liquidation in 1981, accounting for 35% of the total assets of the financial system. From 1987 to 1988, among the 12 private commercial banks in Bolivia, two were liquidated and seven suffered huge losses; in 1988, the value of accounts receivable took up 92% of the banks' net value. Columbia's banking system collapsed in 1985 with losses exceeding 140% of banks' capital and reserves. The central bank of Columbia intervened in six banks whose assets accounted for 24% of total financial assets from 1982 to 1987; five of the six banks had losses over 202% of their capital and reserves in 1985.

Table 1-1 Interest rate liberalization and bank crisis

Country	Interest rate liberalization	Bank crisis
U.S.	1970-1986	1980-1992
Japan	1977-1994	1992-1994
Germany	1962-1976	1974-1976

Argentina	1975-1977	1980-1982
Chile	1974-1975	1981-1987
Mexico	1988-1989	1994-1997
South Korea	1981-1997	1985-1988
Thailand	1985-1992	1983-1987, 1997-2002

Source: Endowment and Path: International experiences for interest rate liberalization, Hongyuan Securities, September 2013

In addition, some countries also saw interest rate fluctuation, exchange rate appreciation, and expansion of credit and money supply and asset bubbles, putting downside pressure on the economy or making it more volatile. Therefore it's important to consider how to avoid the negative impact of interest rate liberalization on the macro-economy.

Table 1-2 The impact of interest rate liberalization on macro-economy and finance in major countries and regions

Country and time period for interest rate liberalization	GDP	CPI	Market rate	Interest rate spread of deposit and lending	Impact on financial institutions	Credit supply	Asset price	Exchange rate
U.S. 1970-1986	Fluctuation in GDP	Rising inflation from 1973 to 1975 and from 1979 to 1983	Deposit and lending rates rose at the early stage of liberalization; peaked at 15.91% in 1981; fell and stabilized thereafter (affected by oil crisis).	The average spread of deposit and lending rates from 1986 to 1990 was 54 basis points lower than that from 1980 to 1985	Savings and loan crisis in the 1980s, large amount of long-term loans could not cover cost of deposits	The average growth rate of credit and money supply from 1980 to 1986 rose 1.05 and 1.89 percentage point, respectively, from that between 1980 and 1990.	NYSE composite rose from over 800 in 1980 to over 1900 in 1990.	
Japan 1977-1994	Recovery in 1975 from the economic recession after the oil crisis	High inflation from 1973 to 1977 and steady decline	Relatively stable with slight fluctuations	The average spread of deposit and lending rates in 1994 dropped 82 basis points	Many banks went under from 1992 to 1994	The average growth rate of M2 from 1984 to 1990 was 3.4 percentage points higher	Nikkei 225 Index hit the record high in 1989; housing market boomed.	The yen appreciated 87.3% against the dollar from 1984 to 1990

		thereafter		from that in 1984		than that from 1984 to 1994		
South Korea 1981-1997	Poor profit for enterprises, economic slowdown and rising social conflict from the end of the 1980s to the 1990s	Slight fluctuation and relatively stable price	Deposit and lending rates rose after reform; rates on corporate bonds increased from 4.4% to 16.3% from 1988 to June 1989; non-bank interest rates rose from 11.6% to 17.5%.	The average spread of deposit and lending rates dropped from around 4% in early 1980s to less than 3% in late 1980s.		The average growth rate of M2 from 1990 to 1996 was 2.7% higher than that from 1990 to 2000	KOSPI rose from 700 in 1990 to over 1000 in 1994, followed by gradual drop.	The won appreciated 21.7% against the dollar during the first interest rate reform and depreciated during the second round of reform.
Latin American countries 1970-1980	5.9% growth rate for the whole region from 1960 to 1973, and 4.5% from 1973 to 1981		Market rate rose first then fell to 3.7% in 1990.	Interest rate spread increased slightly at the early stage of reform and lowered later on.	Bank crisis hit the region. About 15% of Argentinean financial institutions went through bankruptcy and liquidation.		Price level grew at double-digit rate in the 1970s and 1980s	Monetary crisis at the end of 1970s and the beginning of 1980: Currency depreciation, capital outflow, and even economic crisis

In conclusion, though interest rate liberalization can improve the efficiency of resource allocation, it also carries great risks. At the early stage of interest rate reform, the overshooting and wild swings of interest rates will overburden enterprises and threaten the economy; on the other hand, interest rate liberalization can reduce financing restraints on enterprises and households, but the private sector is prone to depend more on debt and banks are more likely to indulge in risky behaviors. For commercial banks that were once under protection but are now completely exposed to market risks, the lack of a coping mechanism could possibly lead to crisis. Therefore, it's important to weigh the benefits and risks when implementing interest rate reform. Domestic situations, such as the depth of economic and financial development and the level of financial regulation, should also be taken into account. With a comprehensive study of the effects of interest rate liberalization, we can choose the right approach that minimizes the risks.

II. China's Road to Interest Rate Liberalization

China's market-based interest rate reform is commonly believed to have started in 1996, when the interbank offered rates were liberalized. However, the process can be further traced back to the initial stage of the reform and opening-up in 1978, when the development of the commodity economy and the use of more technical measures in managing the economy put the market in an increasingly important position for resource allocation. The liberalization of interest rate controls in China in general has gone through the following stages:

A. The initial step

Since 1978, China has been raising the deposit and loan rates after they remained low for a considerable period of time. More types of deposit accounts and rates were created and more variety was added to interest-bearing deposits, which reignited interests for corporate deposits, and membership fees for trade union and the Party. The standards for interest rates were unified and the management of interest rates was enhanced. In 1981, the People's Bank of China (PBOC) released the *Report on Adjusting the Deposit and Loan Interest Rates of Banks* approved by the State Council. The report stated that the interest rates should strictly come under the control of the PBOC, and non-financial institutions shall not set the interest rates independently; specialized banks and other financial institutions must adopt the unified interest rates approved by the State Council and may not set the interest rates themselves unless authorized by the State Council or the PBOC; the PBOC can set different interest rates within the range approved by the State Council. The report laid the foundation for interest rate management and the introduction of market forces in interest rate determination.

a. Loan rates

In the document *Provisions for Implementing the Report on Adjusting the Loan and Deposit Interest Rates of Banks* released by the PBOC in February 1982, it was stated that the interest rates for trust companies' business, such as absorbing trust funds and offering loans and investments, can fluctuate around rates set by the banks but within the range of 20%. Entrusted loan rates can be negotiated between the trustee bank and the entrusting entity but within the range set by the authority.

In 1983, the State Council approved and released a report on transferring the liquidity management of state-owned enterprises (SOEs) to the PBOC. The report allowed the

loan rates of the PBOC to float by up to 20% above or below the benchmark loan rates, which marked the beginning of loosening regulation on loan rates. In January 1987, the PBOC announced that it would delegate the power of determining lending rates to specialized banks. It stated in the announcement that, in order to facilitate the reform of the economic system and to utilize the interest rates to leverage the economy, specialized banks could have the right to adjust loan rates within a 20% range. Specialized banks could raise rates on liquidity loans according to national economic policies by up to 20% above the benchmark rates. The specialized banks could also adjust preferential interest rates except for those for loans to the food system and welfare factories set up by the Ministry of Civil Affairs.

In 1988, the PBOC further empowered financial institutions to adjust the loan rates. The upper fluctuation limit for loan rates was increased from 20% to 30%, and its application was expanded from liquidity loans to almost all types of loans, including fixed assets loans.

However, chaos and confusion were inevitable in the early stage of the reform, causing the authorities to swing between tightening and loosening regulation on interest rates. In 1990, the PBOC revoked the power of its branches to decide on the degree of floating allowed to lending rates of specialized banks and other financial institutions. It also required that the commercial banks, urban credit cooperatives and other non-banking financial institutions strictly abide by the deposit and loan rates set by the PBOC.

b. Deposit rates

In order to boost rural finance and enhance the efficiency of financing as stated in the

No.1 Document of the Central Committee of the Communist Party of China (CCCPC) in 1985, the PBOC published the *Announcement on Strengthening the Regulation on Savings Deposit Rates*, which stated that the credit cooperatives in rural areas (not including the credit cooperatives in cities, towns, counties and major industrial and mining areas) can adopt floating interest rates after being approved by the provincial branches of the PBOC. In the PBOC's *Announcement of Regulation on Savings Deposit Rates* released in April 1987, the deposit rates of rural credit cooperatives in rural areas can float between the lower limit of benchmark rates and upper limit of market interest rates. Those within a floating range of 20% must be approved by the local branches of the Agricultural Bank of China; those above 20% must be approved by the provincial branches of the PBOC.

c. Interbank offered rates

In 1981, the document *Responsibility for Credit Balance* first proposed the development of interbank offered rates. But the interbank lending market did not take off until 1984, when China established a financial system comprising the PBOC, the specialized banks, and other financial institutions. The interbank lending was first limited to specialized banks, and then gradually expanded to other financial institutions. In 1986, the PBOC clarified the term, scope and operation of interbank lending and stated that the interbank offered rates and terms should be negotiated by the lender and the borrower.

In its early stage, the interbank lending market was marked by misconduct. In response, the *Interim Regulation on Interbank Lending* was introduced in 1990, which specified rules on the management of interbank market and the terms of interbank lending: PBOC shall determine and adjust the maturity and interest rate cap for

interbank borrowing according to capital supply and demand; the interbank offered rates should not exceed the PBOC's overnight rates set on specialized banks by 30%; the lenders and the borrowers can negotiate the specific terms and rates within a prescribed limit. The term for interbank lending usually is one month; with the term usually one month; and for loans from financial institutions to specialized banks, the term usually does not exceed four months; no kick-back was allowed in the transactions except for the interest and service fee.

In 1993, faced with an overheated economy, the government rolled out policies to improve the interbank lending market and to enhance regulation on the terms and rates in the interbank lending market. It was stipulated that overnight lending should be the major form of interbank lending, and the term should be no more than one month unless in special cases where the term can be extended to up to seven days. It was also stated that interest spreads and service fees should not be charged at the same time. The interest spreads cannot exceed 0.3% of the interbank bid rates, and the service fees should not exceed the interest spreads for the same period.

B. The take-off stage

The progress of gradual reform has deepened the Chinese authority's understanding of reform. In 1993, the 3rd Plenum of the 14th CPC Central Committee announced the *Decisions on Issues Concerning the Establishment of a Socialist Market Economy*, which brought forward the basic concept of market-based interest rate reform. With the progress of various reforms, the market-based interest rate reform was also advancing gradually.

a. The liberalization of interbank offered rates accomplished

In June 1993, the PBOC released the *Announcement on Further Regulating the Interbank Lending Market*, which called for the establishment of a unified interbank lending market. After several years of experimenting, the national interbank lending market was set up in 1996, and the control on the upper limit of interbank rates was removed.

In 1996, the Ministry of Finance achieved the market-oriented issuance of treasury bonds through securities exchange. In 1997, the interbank repo rates and spot trading rates were deregulated. And in 1998 and 1999, the issuance rates for policy bank financial bonds and treasury bonds in the interbank market were liberalized, respectively.

b. The rapid development of interest rate liberalization for foreign currencies

In September 2000, the deposit rates for large foreign currency deposits (no less than U.S. \$3 million) and the loan rates for foreign currency were liberalized. In July 2003, the deposit rates of small foreign currency deposits within China were liberalized for British Pound, Swiss Franc and Canadian Dollar. In November 2003, the lower limit of the deposit rates for small foreign currency deposits was lifted.

c. The experiment with RMB loan and deposit rate liberalization

In 1994, commercial banks and other financial institutions were again given some autonomy in setting interest rates, but only rates for liquidity loans were allowed to float with a band of 10% below and 20% above the benchmark rates. The commercial banks were required to manage interest rate fluctuations according to the industry policies, the credit ratings of enterprises, and the principle of limiting the low-quality

loans. The commercial banks were required to submit proposals for managing the interest rates to the PBOC for approval. In May 1996, in order to reduce interest payment for enterprises, the upper limit of loan rates was reduced from 20% to 10%.

On October 31, 1998, to address the difficulties for small and medium-sized enterprises (SMEs) to access loans and encourage banks to provide SMEs loans, the rates for loans from financial institutions to SMEs were allowed to fluctuate 20% maximum above the benchmark as opposed to 10% before, and the rates for loans from rural credit cooperatives were permitted to fluctuate 50% maximum above the benchmark as opposed to 40% before. The cap on loan rates for large and medium enterprises remained at 10% above the benchmark. In 1999, the rates for loans from financial institutions in counties and villages to SMEs were permitted to float above the benchmark rate by up to 30%, while the floating cap of loan rates for big enterprises remained the same. In August 2003, the loan rates for rural credit cooperatives in pilot regions were allowed to float up to 100% above the benchmark.

C. The consolidation stage

a. Steady progress of deposit and loan rate liberalization

In 2002, the report of the 16th National Congress of the CPC pointed out that the market-based interest rate reform must be pushed forward to improve the efficiency of financial resource allocation. In 2003, the 3rd Plenum of the 16th CCCPC issued the document *Decisions on Improving the Socialist Market Economic System* which set the framework and goals of interest rate liberalization, marking a breakthrough in the market-based interest rate reform.

In January 2004, the cap of loan rates for commercial banks and urban credit cooperatives was raised to 1.7 times the benchmark rate, while that for rural credit cooperatives increased to 2 times the benchmark rate. On October 29th 2004, the PBOC decided to remove the cap on loan rates for financial institutions (except for credit cooperatives). The cap on loan rates for credit cooperatives remained 2.3 times the benchmark rate, while the floor of loan rates for all financial institutions stayed at 0.9 times the benchmark rate. However, the deposit rates were permitted to fluctuate below the benchmark but not above. By then, the cap on loan rates and the lower limit for deposit rates were basically lifted.

b. Interest rates for foreign currency loans and deposits were basically liberalized.

In November 2004, while adjusting the rates for small domestic deposits in foreign currencies, the PBOC decided to liberalize the rates for such deposits with terms longer than one year.

c. Enhancing the price-setting mechanism of financial institutions

The goal of interest rate liberalization is to have the market replace the monetary authorities and play the decisive role in determining interest rates with the banks setting deposit and loan rates. Before the reform, China's interest rates had been under government control. The loan and deposit rates were determined by the PBOC instead of commercial banks, and the interest spreads between deposits and loans were fixed. The commercial banks were unable and did not need to set the price. As a result, they lacked the ability for price-setting. After the interest rates were liberalized, the price-setting ability of commercial banks became the key to the progression and success of the interest rate reform.

Throughout the process of interest rate liberalization, China has always emphasized the improvement of the price-setting ability of financial institutions. In 1998, the PBOC researched the banks' practice of managing floating interest rates and selected a few national and regional banks as role models for other banks. The PBOC asked banks to develop price-setting models and software and to establish the price-setting authorization system. When the banks were granted more autonomy in managing floating loan rates in 2003, the PBOC once again urged the commercial banks and credit cooperatives to build up pricing system on loan rates, and provided the rural credit cooperatives with four templates for setting the floating range of loan rates. Under the guidance of the PBOC, the four major commercial banks (Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, and China Construction Bank) and other large commercial banks established a standardized interest rate management system and pricing policies. The joint-equity commercial banks set up a pricing management mechanism comprised of the asset and liability management committee and the financial planning department. They also established unified pricing policies and a graded pricing authorization system.

d. Improving the benchmark rate system

Benchmark rates play a fundamental role in the interest rate system and act as a reference for the pricing of other financial products. As the pricing basis for fixed-income instruments and other financial products, and as a reference for monetary policies, benchmark rates are essential to many areas of reforms, such as interest rate liberalization, the monetary policy transmission mechanism, the pricing mechanism, innovation in the financial market, internal funds transfer pricing for financial institutions, exchange rate reform, and RMB internationalization. They are

also important for the healthy, stable and orderly development of the financial system (Yi, 2008). From 1996, when China deregulated the interbank offered rates, to 1999, when the treasury bonds began to be issued by tender, the interbank interest rates had been market-determined, and the methods, variety and scale of transactions had greatly improved. However, China had not formed a comprehensive benchmark rate system in the money market. As interest rate liberalization moved forward, the establishment of an effective benchmark rate system became increasingly important. In October 2006, the benchmark rate for money market – Shanghai Inter Bank Offered Rate, or Shibor – was put on a test run and officially launched on January 4th, 2007. In recent years, the benchmark rate system has been developing fast and the status of Shibor has been rising. A benchmark rate system based on Shibor and government bond yield curves has started to take shape.

D. The crucial stage

With the regulatory framework which controlled the lower limit of loan rates and the upper limit of deposit rates, the pricing ability of financial institutions has increased greatly. The commercial banks have preliminarily established a market-based incentive and restraint mechanism. In addition, the financial markets, including the money market, capital market, foreign exchange market, gold market and insurance market, have further developed. All this provided favorable conditions on both the macro- and micro-levels for further interest rate reform. At the same time, financial innovation (e.g. bank's wealth-management products, trusts and Internet finance) and financial disintermediation have developed rapidly, and China's economic growth model and economic structure have been going through transition, which in turn has made interest rate liberalization the intrinsic demand of market entities. With demand

and policy support coming together, the reform of loan and deposit rates was further promoted in 2012. The 3rd plenum of the 18th CCCPC made the decision to comprehensively deepen the reform, changing the wording from steadily push forward interest rate liberalization to accelerate interest-rate liberalization. This marked a milestone for the liberalization of deposit and loan rates.

a. Complete liberalization of loan rates

On June 7th, 2012, the PBOC announced that the lower limit for loan rates for financial institutions had been adjusted from 90% of the benchmark rates to 80%, and the floor was further adjusted to 70% on July 5th.

On July 19th, 2013, the PBOC released the document On Pushing Forward the Market-based Interest Rate Reform, which removed the lower limit for loan rates (except for individual commercial housing loans) and the regulation on discount rates. Meanwhile, the upper limit for loan rates of rural credit cooperatives was lifted. In this regard, the regulation on loan rates was basically removed.

b. Establishment of a self-discipline pricing mechanism for market interest rates

On September 24th, 2013, a conference was held on the establishment of a self-discipline pricing mechanism for market interest rates. The mechanism aimed to maintain fair competition and healthy development in the financial market by managing interest rates on money and credit markets.

In order to further improve the interest rate pricing mechanism, China drew from international experience and established a centralized mechanism for quoting and publishing loan prime rates (LPR), and this mechanism was officially launched on

October 25th, 2013, after a month of pilot run. The LPR is what commercial banks offer to their best customers. It is also the basis for other loan rates. Under the LPR centralized quoting and publishing mechanism, the weighted average of LPR quoted by each commercial bank was published. The mechanism is an extension of the Shibor system in the credit market. It can help enhance the benchmark rate system in the financial market and smooth the transition from a government-controlled interest rate system to a market-based system. It can also raise the efficiency and transparency of credit product pricing and reduce irrational pricing. In addition, the mechanism serves to improve the regulation of the PBOC and lay the foundation for future interest rate liberalization.

c. Adjustment of the cap on the deposit rates

On June 7th, 2012, the PBOC announced its decision to adjust the upper limit of deposit rates to 1.1 times of the benchmark rates, the first time it had allowed the deposit rates to float above the benchmark rates. The adjustment of the rate cap received positive reactions. After the announcement, many banks adjusted their deposit rates accordingly. A diversification in deposit pricing started to emerge, with state-owned banks, joint-equity banks and urban commercial banks setting up their own rates.

d. Steady progress of the issuance and trading of interbank certificate of deposits

Interim Measures on Managing Interbank Certificate of Deposits was published on December 8th, 2013, by the PBOC and was put into operation on December 9th, 2013. On December 12th and 13th, 10 financial institutions, including Bank of China, China Construction Bank and China Development Bank, issued their first batch of such

products and later traded on the secondary market, establishing a bilateral quoting system with interbank certificate of deposits. The interbank certificate of deposits is priced by the market and is electronic, standardized, liquid and transparent. It can provide mid-and-long-term Shibor with more transparent and marketized pricing reference, which will solidify the benchmark status of Shibor rates, enlarge the financing channels for deposit-taking financial institutions, and standardize the interbank transactions. Meanwhile, it can help accumulate experiences in issuing large certificates of deposits to enterprises and individuals, and can bring valuable insights for the advancement of interest rate liberalization.

e. Removal of the cap on deposit rates

After allowing the deposit rates to float above the benchmark rates, the PBOC further raised the cap. In November 2014, March 2015 and May 2015, the caps for deposit rates of financial institutions were adjusted to 1.2, 1.3 and 1.5 times of the benchmark rates, respectively. On October 23rd, 2015, the PBOC published Announcement on Lowering the RMB Benchmark Rates for Deposits and Loans and Advancing the Market-based Interest Rate Reform, which stated that from October 24th, 2015, the cap for deposit rates of commercial banks and rural credit cooperatives would be removed. By then, the deposit rates were liberalized.

III. Characteristics of Interest Rate Deregulation in China

A. China's interest rate liberalization is incremental

The deregulation of interest rates in China was incremental. One characteristic is the long duration, as this process has been going on for more than 30 years since the

reform was first started, or more than 20 years since 1993 when China clearly formulated the blueprint for market-based interest rate reform, or 19 years since 1996 when China liberalized the interbank offered rates. Compared with other countries that adopted an incremental approach, the process in China is taking a long time.

Table 1-3 Timeframe of interest rate liberalization in major countries

Countries	Duration
U.S.	1970-1986
France	1965-1985
Japan	1977-1994
Australia	1973-1985
South Korea	1981-1997
India	1992-2011

The second characteristic is that incremental liberalization of interest rates follows a certain sequence though the sequence may vary among countries. The U.S. first liberalized rates for large deposit, then rates for small deposits, and rates between non-banking institutions before interbank rates. Japan started with liberalization of rates on Treasury bonds before expanding to other products, from the rates in the interbank market to the retail market, from long-term interest rates to short-term rates, and from large transactions to small ones. South Korea began from non-bank financial institutions and then moved to banks and from lending rates to deposit rates. China liberalized money market rates and bond market rates first, then gradually pushed forward the liberalization of deposit and lending rates, which followed the order from foreign currency to domestic currency, from loans to deposit, and from long-term and large-amount deposits/loans to short-term and small-amount ones.

B. The process of interest rate liberalization reflects the characteristics of China's reforms

a. The reform is incremental and complementary

China had no holistic blueprint or clear target at the beginning of the economic reform. Deng Xiaoping coined the saying “crossing the river by groping for stones” to describe China’s reform process. It shows that China was doing it step and step and learning by experimenting.

This model of incremental reform means the process was easier at the early stage and became harder along the way. The economic system comprises many sectors with different priorities and conditions. And the costs and benefits of reforms for different sectors also vary. Therefore, the process often starts from sectors with the easiest breakthroughs and lowest costs.

Another important characteristic of incremental reform is maintaining the interest rate structure and allocation mechanism for the existing financial sector and adopting a market mechanism for newly developed businesses. As the reform and development take hold, the proportion of market economy increases and eventually dominates.

However, the different sectors of the economic system are closely related, and a slight move in one part would affect the entire system. Therefore, incremental reform should follow a certain order. The reform of one sector should be complemented by reform of other sectors, and the reforms of the various sectors should be mutually beneficial.

Incremental reform is an ever-improving process. Constrained by institutional conditions, the reform of one or a few sectors might not progress as expected; even

when the process has reached an ideal state, it might regress. For example, China implemented household contract responsibility system in the rural area and rolled out reform of state-owned enterprises in the cities. However, even today the property and the associated management rights of farmers remain a problem, and reform of state-owned enterprises remains a key issue. Therefore, reform is a dynamic and ever-evolving process.

Interest rate reform as a subset of systemic reform is connected with reform of other sectors. As interest rate reform involves a lot of stakeholders and risks, it should be carried out after reforms less risky and less difficult, and when the reforms of other sectors have set the right conditions. As interest rate reform itself is a huge undertaking, its implementation should start from the easy part before moving onto the difficult part and from the newly developed market to the existing market. For example, interest rates that have less impact, such as the money market rates, bond market rates and foreign currency market rates, should be liberalized first, followed by RMB deposit and loan rates; and the infrastructure of the financial market should be solidified first before liberalization of interest rates. Acceleration of reforms of other sectors that could serve as the basis for interest rate reform can also speed up the latter, while the stagnation of the former could delay the latter. The decision-making process on whether to push forward the reform can also influence the process.

b. Interest rate liberalization goes hand in hand with financial development

Compared with developed economies or some emerging economies that deregulated their interest rates in a relatively mature financial system, China's interest rate liberalization went hand in hand with the development of its financial system. Different from former Soviet Union and Eastern European countries that liberalized

their interest rates before development of the financial sector, China gradually deregulated interest rates based on specific needs and circumstances while developing the financial sector.

i. The liberalization of deposit and lending rates undertaken alongside the development of the banking sector

The PBOC was the one and only financial institution in China during the planned economy period. The economic reform triggered development of the financial sector. In February 1979, the government tasked the Agricultural Bank of China (ABC) to support economic development in the rural area, and rural banking business was handed over from the PBOC to the ABC. And in March 1979, Bank of China was spun off from the PBOC to specialize in foreign exchange business to cater to the demand of opening-up and international economic exchange. China Construction Bank was separated from the Ministry of Finance in 1979, and in 1982 it was established as a national financial institution to operate general banking business in addition to allocation of funds. The Industrial and Commercial Bank of China was set up in January 1984, taking over all industrial and commercial credit business and savings business from the PBOC. Since then the PBOC has been functioning solely as the central bank. The Bank of Communications was re-established in 1986, followed by the establishment of more than 10 joint-equity commercial banks. In the meantime, many non-bank financial institutions were set up, including credit cooperatives, insurance companies, trust and investment corporations, securities companies, finance companies for enterprise groups, financial leasing companies and investment funds, while many foreign financial institutions were introduced. As these specialized banks were performing the dual role of commercial banks and national policy tasks, three

policy banks -- China Development Bank, the Export-Import Bank of China and Agricultural Development Bank of China -- were established in 1994 to streamline their responsibilities. A financial system comprising commercial banks, policy banks and non-bank financial institutions was established with the central bank at the center.

During this development process, China had simplified the business operation of the banking sector and was looking to grant more rights to banks on interest rate pricing. With the reform and development of commercial banks, the liberalization of deposit and lending rates are also moving forward, as they are closely connected: Only when there are commercial banks, can there be interest rate liberalization; and only when commercial banks are developing well, can the liberalization of interest rate progress rapidly. And when commercial banks are not doing well, the liberalization of interest rates would also face difficulties.

ii. Interest rate liberalization makes breakthrough alongside the development of the financial market

Ever since 1984, with the economic reform in full swing, all kinds of market financing activities have been emerging and developing. First, the expansion and standardization of commercial credit helped create the market for bankers' acceptance. From February 1984, the PBOC started to carry out discounting business of bankers' acceptance nationwide.

Second, the government adopted a new credit management system in 1985, and since then specialized banks could borrow funds from each other. The quota for interbank borrowing was increased in 1986 with the development of financial institutions. By the end of 1987, major cities and regions in China had opened up interbank markets,

and in March 1990, the PBOC announced tentative management measures for interbank borrowing, which stipulated the rules and requirements for this business.

Third, the foreign exchange market also expanded with the deepening of institutional reform and opening-up. Shenzhen established China's first foreign exchange swap center in December 1985, and by 1988, all provinces, autonomous regions, municipalities directly under the central government and special economic zones had set up such centers, further opening-up the foreign exchange market to more market participants while allowing the price of foreign exchange to fluctuate according to market demand and supply. In September 1988, Shanghai launched open transactions of foreign exchange and gradually set up several the foreign exchange open markets in the following years.

Fourth, the government first issued treasury bills in 1981, and by 1984, the treasury bills were widely held with the demand for trading. Trans-regional and standardized trading of treasury bonds started to take off in 1991, and the Ministry of Finance and the PBOC started a tryout of repo business the same year.

Fifth, with the development of reform on enterprise ownership system, the capital market and new types of financial intermediary were introduced. A new wave of direct financing emerged in 1984, with many companies issuing stocks and bonds. The Shanghai Stock Exchange was launched on December 19th, 1990, and Shenzhen Stock Exchange on July 30th, 1991. The establishment of the two stock exchanges marked the standardization of China's stock market. Important financial intermediaries such as securities firms and securities investment funds were also founded.

With the banks as the backbone of the financial sector, interest rate liberalization in the financial market will not have a fundamental effect on the stability of the financial system, nor on the financing cost for enterprises. It's for this reason that China first carried out interest rate liberalization in the financial market. Moreover, China had always put institutional improvement in the first place, which created positive institutional settings conducive to the liberalization of interest rates.

iii. Interest rate liberalization goes hand in hand with monetization and the proliferation of financial products

As the modern financial framework came into being, the allocation of social capital went through fundamental changes. The share of fiscal spending declined rapidly while that of financial capital took the dominant place. Economic monetization also sped up with broad money increasing 19 times from 1978 to 1992 and GDP growing seven times during the same period. "The ratio of broad money to real GNP rose steadily from 0.32 to above 1.0, which reflected the monetization effect of institutional reform" (Yi, 2008). There came the problem of how to better control and regulate the flow of financial resources after the financial sector had become essential to the economy, and it's in this context that the liberalization of interest rate was put on the agenda.

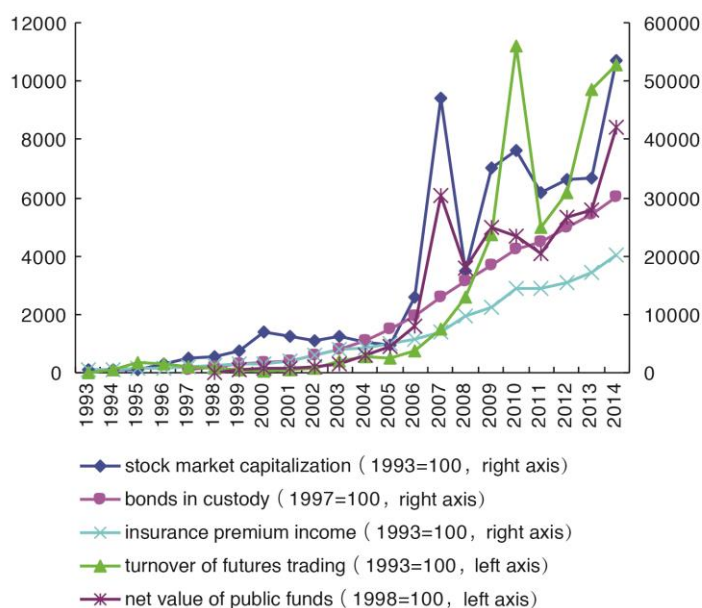
Along with the monetization process in China, the variety of financial products also increased. In addition to cash and bank deposit, financial instruments such as bonds, stocks, funds, futures and insurance products were emerging. The number of bonds in custody increased from 43 in 1997 to 4,857 in 2014 (112 times rise), and the value of the bond market rose from 478.08 billion RMB to 28.73 trillion RMB (59.1 times jump) during the same time. The stock market capitalization grew from 347.43 billion

RMB in 1993 to 37.3 trillion RMB in 2014 (106.2 times increase), and the trading volume of stock exchange jumped from 22.621 billion shares to 7375.461 billion (325 times surge), and the turnover from 369.795 billion RMB to 74.4 trillion RMB (200.2 times increase). The net value of publicly offered funds rose from 10.76 billion RMB in 1998 to 4,535.36 billion RMB in 2014, a 420.5 times rise. Trading of futures rose from 8.907 million lots in 1993 to 2.51 billion in 2014 (280.3 times increase), and the turnover from 552.20 billion RMB to 292 trillion RMB (527.8 surge). Insurance premium income rose from 49.96 billion RMB in 1993 to 2,023.48 billion RMB in 2014, rising 39.5 times. The balance of banks' wealth-management products rose from 530.00 billion RMB at the end of 2007 to 12.65 trillion RMB at the end of June 2014, a 22.9 times jump.

With the increase of financial products, a rigid regulatory system on interest rates can hardly provide reasonable pricing for financial products; instead it could cause price distortion. In this regard, interest rate liberalization was an inevitable choice for China.

Figure 1-1 Rapid development of financial products

Figure 2-6 Structural impulse response functions of regulated and market inte
 Figure 1-1 Rapid development of financial products



c. Market forces and government guidance both play their vital roles

Each step of interest rate liberalization was achieved with the concerted effort of the market and the government. At the initial stage when the reform of property rights for enterprises and financial institutions was advancing and the financial market was starting to take shape, it became inevitable to introduce market mechanisms into the allocation of capital. The CPC and the State Council took lessons from the past and set the agenda for reform. In 1993, Decision on Some Issues Concerning the Establishment of Socialist Market Economy and the State Council Decision on Reform of the Financial System were passed during the 3rd Plenum of the 14th CPC Central Committee, which brought forward the ideas for interest rate liberalization. Under these two sets of guidelines, China's market-based interest rate reform was officially launched.

Ever since the 2000s, China's socialist market economy has been improving gradually. China's entry into the WTO further opened up the financial market to the outside world. Securities, funds and insurance business have been developing fast, with new financial instruments emerging and foreign banks entering the domestic market. Under such circumstances, the report of the 16th Party Congress restated the need to steadily push forward market-based interest rate reform and optimize the allocation of financial resources. In 2003, *Decision on Some Issues Concerning the Improvement of Socialist Market Economic System* was announced at the 3rd Plenum of the 16th CPC Central Committee, which pointed out that interest rate liberalization should be pushed forward steadily and an interest rate formation mechanism based on market supply and demand should be established and promoted, and the central bank should provide guidance to interest rates through monetary policy instruments. A series of crucial decisions made by the CPC Central Committee and the State Council defined the direction and set the blueprint for the market-based interest rate reform. The reform took an important step in 2004 and achieved the goal of controlling the lower limit of lending rates and the upper limit of deposit rates.

In recent years, with the rapid development of wealth management products, trust products and Internet finance, China's economic growth and structural changes have undergone a transformation and the landscape of the economy and financial market has changed fundamentally. It's an intrinsic demand of market players who started to take action to promote interest rate liberalization. To comply with market demand, the liberalization of deposit and lending rates were speeded up after 2012, with the complete liberalization of lending rates and the gradual relaxation of the upper limit on deposit rates. The 3rd Plenum of 18th CPC Central Committee made the decision to comprehensively deepen the reform, changing the wording from "steadily push

forward interest rate liberalization” to “accelerate interest-rate liberalization”. China’s reform of interest rates since then has entered a new stage. The upper limit on deposit rates was relaxed a few times from 2014 to 2015 and completely removed in October 2015. Since then China has basically lifted all controls on interest rates.

d. The relations between reform, development and stability

As international experience has shown, interest rate reform is a double-edged sword, which can enhance the efficiency of resource allocation and also create financial volatility, and therefore the tradeoff between benefit and risk should be weighted carefully. As a transitional economy, China’s institutional environment and market conditions are changing rapidly, which pose more risks than countries with a mature market economy. For China, reducing risks and maintaining stability during the process of interest rate reform is a priority. The relationship between reform, economic development and financial stability must be handled well to make sure interest rate reform can progress smoothly. For China, reform, development and stability are supportive of each other. The goal of reform is to achieve sustainable development and lasting stability; without steady development, people will lose faith in reform; and without stability, there will be no solid foundation for reform. However, it could be difficult to balance all three elements. When risks or development are priority, reform measures would be delayed, but unsuccessful reform measures could also lead to chaos. For instance, when the regulation on interest rates was slightly loosened in the 1980s, the commercial banks in some regions started a war on interest rates. However, trial and error, and correction mechanisms and a coordinated reform approach helped manage the relations between development, reform and stability. Most importantly, China emphasizes the effective coordination between reform and

regulation. Whether it's the reform of lending and deposit rates in 2004 or the further promotion of this reform since 2012, the government has integrated reform into regulation and combined the need of monetary policy adjustment with market risks, achieving a good balance among reform, development and stability.

Chapter 2 Characteristics of China's Interest Rate System

The essence of market-based interest rate reform is to transfer the capital pricing power from the government to the market, and its core lies in deregulating interest rates to expand market players' pricing power and optimizing the allocation of resources. If the developing and transitional economies want to successfully achieve the goals of reform, they need not only allow market players the pricing power, but also foster many conditions for liberalization and establish a sound market-oriented interest rate formation mechanism. This will enable market players to form reasonable price equilibrium through competition.

In this regard, deregulating interest rates is an important step does not all of the reform. Instead, whether reasonable equilibrium interest rates can be established under better market conditions is the core of the market-oriented reform. The *12th Five-year Plan of China's Financial Development and Reform* summed up the principles for China's interest rate liberalization as loosening rate controls, establishing market-based interest rates and building an effective adjustment mechanism. On the one hand, the level, risk structure and term structure of interest rates should be determined by capital supply and demand; on the other hand, it refers

to an interest rate system with smooth rate transmission at different levels, in which the benchmark interest rate plays a dominant role. Therefore, China's market-based interest rate reform is not only a process of removing controls on interest rates, but also a process of establishing a market-based interest rate formation mechanism. This chapter will study how market-based interest rates are formed and transmitted during the liberalization process.

I. The Dual-Track Feature of Interest Rates in the Process of Gradual Reform

A. Gradual reform and the dual-track price system

China's economic reform is a gradual transition from the planned economy to a socialist market economy. The price mechanism is the core of the market economy, and the liberalization of the price mechanism is the key in the transition to a market economy. The crucial aspect in the establishment and improvement of China's socialist market economy is to gradually remove price controls, ultimately set up a market price mechanism in which the supply and demand play a decisive role, and realize the optimized allocation of social resources through price signals to microeconomic entities. China aims to introduce a market mechanism to the allocation of financial resources, improve capital allocation efficiency through the price leverage, and change its regulation on financial resources from direct intervention to indirect market-oriented regulation. This is the key of the financial market reform and the purpose of interest rate liberalization.

In view of the complexity of price reform and its impact on the economy, China

adopted a dual-track approach in the 1980s. This method had two pricing mechanisms: Price control was maintained in the planned system while outside of the system the price was determined by supply and demand. Under normal circumstances, the planned prices were usually low. But when faced with competition from market prices, the manufacturing in the planned sector gradually contracted and the market sector expanded, and finally the market price system replaced the planned price system completely. Lau, Qian and Roland (1997, 2000) demonstrated that the dual-track price reform was identical to a redistribution mechanism of goods and was a win-win strategy in terms of welfare as it increased the benefit of certain economic entities without harming others. Shrinking of the planned sector forced the economy to move toward resource allocation not based on plans, and therefore the dual-track price reform can be considered a Pareto improvement.

The effective implementation of the dual-track price system must fulfill one essential condition — the government must be able to control the planned sector's behavior and distinguish the planned sector from the market sector. Murphy, Shleifer and Vishny (1992) studied the failure of former Soviet Union and Eastern European countries, and their analysis shows that those countries only implemented a partial price liberalization reform without strict control over the planning sector, which resulted in the massive transfer of resources and reduced the efficiency of resource allocation and ultimately caused a net loss to social welfare. The practice of the dual-track price system in China also faced similar problems, and the price reform failure in 1988 fully exposed the disadvantages of the dual-track system. However, the interaction between the market price and the planned price greatly raised the efficiency of the planned sector. Even though the market prices were inevitably affected by the planned price, the movement of market prices pushed the government

department in charge of planned prices to recognize the supply and demand relationship implied by market prices and therefore move planned prices closer to market prices. Although the price system went through a period of chaos in late 1980s, the reform gradually moved forward. The supply and demand of goods and the institutional environment of the market economy improved greatly and by mid-1990s China had basically achieved price liberalization for general commodities and services. The successful experience of the dual-track pricing system provided a feasible path to the financial liberalization, and the dual-track system of interest rates with interest rate liberalization as its goal has become an important part of China's financial reform (Yi, 2009).

B. Characteristics of dual-track interest rate system: The narrowing of interest rate regulation and expansion of market interest rates

Given that financial markets at various levels exert varying degrees of influence on the allocation of financial resources, the liberalization of prices started from markets that have less effect on the economy. For example, since the exchange rate has a small effect on the allocation of domestic financial resources, China merged the dual track exchange rates and reformed the exchange rate formation mechanism as early as 1994. In terms of interest rate liberalization, “while maintaining interest rate regulation, the introduction of interest rate liberalization at the margin made the reform likely to be a Pareto improvement, which means it could improve the allocation efficiency of financial resources in the banking sector without harming the real economy” (Yi, 2009). Therefore, along the process of liberalization, China's interest rate system shows dual-track features, i.e. the co-existence of controlled interest rates in the banking system and market-based interest rates outside the banking system.

“With the dominance of indirect financing, the liberalization of interest rates in the wholesale capital market would not affect corporate financing costs, but could help improve the efficiency of capital allocation” (Yi, 2009). China’s interest rate liberalization therefore first achieved a breakthrough in the wholesale capital market. In 1996, China removed control on interbank offered rates and by 1999 had completed the liberalization of interest rates in the bond issuance and secondary markets. Meanwhile, by developing the interbank market, giving access to more market participants and enriching the variety of products and payments, the interbank bond market had become China’s main fixed income market, providing favorable conditions for the yield curve improvement and indirect control of the monetary policy. The interest rates in the capital market consisting of the money market and the bond market were completely decided by the supply and demand. “The liberalization of interbank interest rates successfully established a capital allocation system beyond the controlled interest rate regime. The formation and improvement of interbank interest rates provided a benchmark yield curve for independent pricing by commercial banks, and paved the way for the liberalization of the controlled interest rates and banks’ internal pricing mechanism” (Yi, 2009).

After the early exploration, the deposit and lending rates were gradually liberalized. Similarly, following the principle of risk minimization, China liberalized the interest rates of foreign currency first and then gradually expanded the floating range of RMB lending rates, and then achieved the goal of controlling only the upper limit of deposit rates and the lower limit of lending rates. Afterwards, China step by step expanded the floating range of lending rates for financial institutions and finally removed the lower limit of lending rates. China extended the reform from large fixed deposit rates to other deposit rates, allowed the deposit rates to go up, established the self-discipline

mechanism in banks for interest rate pricing, carried out interbank certificate of deposit business, improved the capabilities of financial institutions in liabilities interest rate pricing and risk management, and ultimately lifted the ceiling on deposit interest rates.

The aim of RMB deposit and lending interest rates reform is Pareto improvement. China has been steadily promoting the reform by way of product innovation and expanding the scope of market pricing. Take deposit as an example. Since 1999, China had allowed commercial banks to employ market-based interest rates for long-term large deposits from institutions such as insurance companies, individual pension account and the National Social Security Fund in the form of negotiated deposits. The interbank certificate of deposits business was first established to accumulate experience for large deposits business targeted at individuals and corporations. Meanwhile, the volumes of financial products substituting deposits whose prices are determined by the market, e.g. the wealth-management products (the WMPs) are gradually expanding. In recent years, the rapid development of financial innovation and financial disintermediation greatly enriched the variety of financial products and influenced the regulation on deposit rates. The source of bank funds showed clear features of the dual-track interest rates.

With the growth of general deposits slowing down, the weighted average yields of closed-end NAV and non-NAV wealth-management products and open-end non-NAV wealth-management products reached 5.07%, 5.06% and 3.89% respectively in 2014. The balance of wealth-management products issued by banks rose from 10.2 trillion RMB at the end of 2013 to 15.02 trillion RMB in 2014, an increase of 46.68%; the average daily balance of wealth-management products issued by banks was 13.75

trillion RMB, increasing by 43.38% year on year¹, while the balance of RMB deposits at the end of 2014 only rose by 9.1% compared to 2013, and the ratio between wealth-management products balance and RMB deposits balance surged from 9.8% at the end of 2013 to 13.2% at the end of 2014. Internet finance led by products such as Yu'E Bao was developing fast and the volume of money market funds had exceeded 2 trillion RMB. The liberalization of interest rates was not only a goal set by policy-makers but also an intrinsic demand of market players. In particular, the rapid development of Internet finance fully illustrated the power of the market, and market participants' pursuit of high yields and the spontaneous adjustment of market supply had in fact broken the barriers for interest rate liberalization of large and small funds, disrupting the reform sequence of large capital first and small capital later and establishing a dual-track deposit interest rate landscape consisting of shadow banking rates and controlled deposit rates, which created favorable conditions for the ultimate deregulation of deposit rates.

C. China's dual-track interest rate system and the progress of interest rate liberalization

a. Interest rate liberalization from the perspective of social financing structure

Social financing mainly consists of RMB loans (housing loans and non-housing loans), foreign currency loans, entrusted loans, trust loans, non-discounted bank acceptance bills, corporate bond financing and domestic equity financing by non-financial enterprises. As of June 7th, 2012, only the lower limit of RMB lending rates was controlled. For instance, the lower limit of housing loans rates was 70% of

¹Annual Report on Banks' Wealth-Management Products in China (2014), China Central Depository & Clearing Co., Ltd. (CCDC), "Information Registry System for Banks' Wealth-Management Products", May 2015.

the benchmark interest rate, and the lower limit of non-housing loans rates was 90% of the benchmark interest rate, while the pricing of other types of financing had largely been liberalized.

Regarding the share of financing, before 2011 when the lower limit of lending rates was adjusted, about 34.8% of total financing had been liberalized and about 58.2% of total financing (RMB loans) was still regulated with regard to the lower limit. The interest rates of 51.7% of the non-housing loans could float downward by 10% and rates of 6.5% of the housing loans could float downward by 30%.

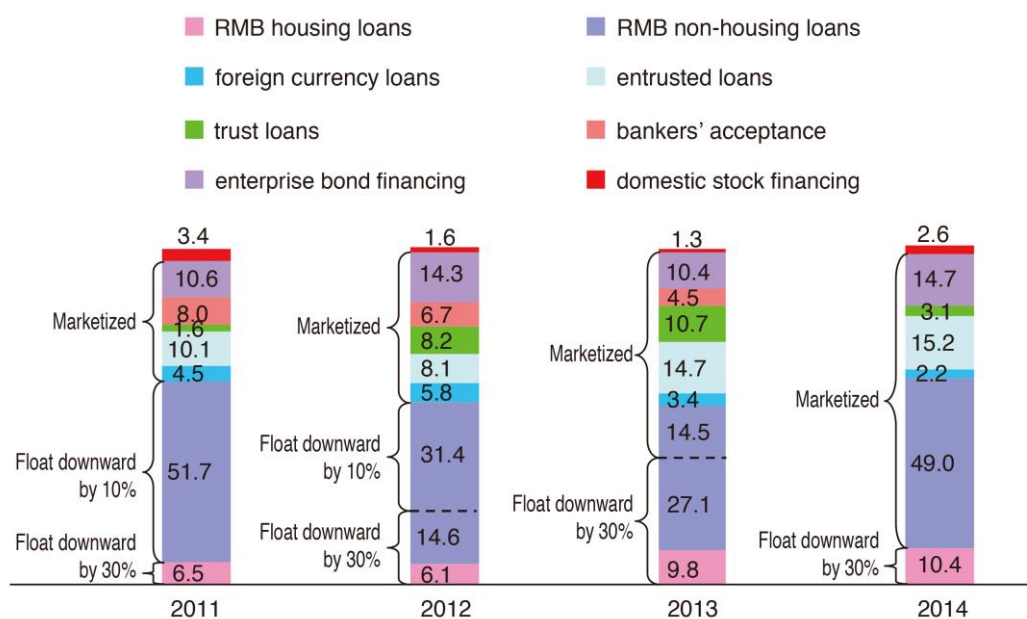
On June 8th and July 6th, 2012, the lower limit on lending rates was adjusted to 80% of benchmark interest rates and then to 70%, respectively, but the lower limit on housing loan rates stayed the same. In the same year, around 43.1% of total social financing achieved interest rate liberalization, while 52.1% of RMB loans were still under regulation, of which 31.4% were allowed to float up and down by 10% of the benchmark rates and 20.7% were allowed to float by 30% (about 14.6% were due to adjustment of the lower limit and 6.1% were housing loans whose rates could fall by 30% originally).

On July 20th, 2013, the lower limit on lending interest rates was removed except for housing loans whose interest rates remained 70% of benchmark rates. In that year about 58.2% of total social financing achieved interest rate liberalization (about 14.5% was due to the deregulation of the lower limit of lending rates, and about 43.7% was liberalized before 2013), and about 36.9% of social financing could float by 30% of benchmark interest rates.

In the year 2014, about 84.2% of social financing achieved interest rate liberalization,

leaving only RMB housing loans with a lower limit of 70% of benchmark rates. The interest rate liberalization of social financing was basically accomplished by July 20th, 2013.

Figure 2-1 The progress of interest rate liberalization based on social financing structure



b. Interest rate liberalization from the perspective of banks' assets and liabilities

Banks have assets in four categories: loans (housing loans and non-housing loans); marketable securities and equity investment; reserve deposits; and interbank transactions. As of June 7th, 2012, the interest rates of non-housing loans could float by 10% of benchmark interest rates and that of housing loans could float downward by 30%. Marketable securities, equity investment and interbank business had achieved market-oriented pricing. The interest rates on required reserves as policy interest rates were not targeted in the liberalization process.

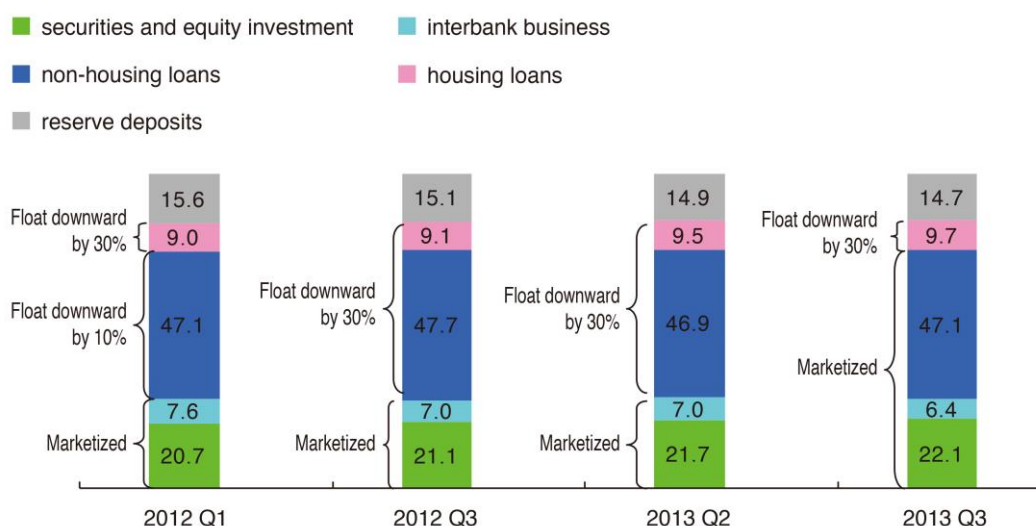
The lower floating limit of RMB lending rates were adjusted from 10% below the

benchmark to 20% on June 8th, 2012, and then later to 30% on July 6th, 2012, while the lower limit of housing loan interest rates remained the same at 70% of benchmark rates. At the end of Q1 2012, loans accounted for 56.1% of banks' assets and the interest rates were regulated by a lower limit. For instance, the interest rates of non-housing loans (47.1% of assets) could float downward by 10% maximum and the interest rates of housing loans (9.0% of assets) could float downward by 30% maximum. Marketable securities and equity investment accounted for 20.5% of banks' assets, and interbank transactions accounted for 7.6%, and both had achieved market-oriented pricing. At the end of Q3 2012, loans accounted for 56.8% of banks' assets with a lower limit of 0.7 times benchmark interest rates, of which non-housing loans (47.1% of assets) could float downward by 30% maximum due to the adjustment in July 2012 and that of housing loans (9.1% of assets) could float downward by 30% even before 2012. Marketable securities and equity investment (21.1% of assets) and interbank business (7.0% of assets) had achieved market-oriented pricing.

On July 20th, 2013, the lower limit of RMB lending rates was removed, but the lower limit of housing loan rates, which was 70% of benchmark interest rates, was retained. At the end of Q2 2013 just before this adjustment, loans accounted for 56.4% of banks' assets (non-housing loans 46.9% and housing loans 9.5%), and loan rates were allowed to float downward to 70% of benchmark rates. Securities and equity investment accounted for 21.7% of banks' assets and interbank business accounted for 7.0%, and both had achieved market-oriented pricing. At the end of Q3 2013 after the adjustment, non-housing loans, securities and equity investment, and interbank business accounted for 47.1%, 21.1% and 6.4% of banks' assets respectively, and 74.6% in total. These three types of assets had achieved interest rate liberalization, of which

non-housing loans (47.1%) were deregulated in this round of adjustment, while housing loans (9.7%) still retained the lower limit of 70% of the benchmark interest rate.

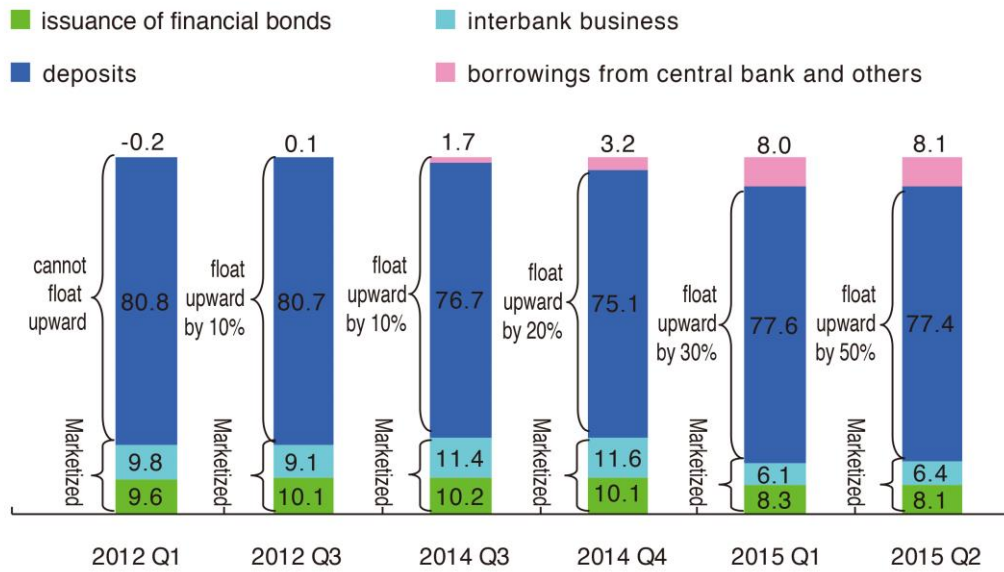
Figure 2-2 The progress of interest rate liberalization based on banks' assets



On the assets side at the end of Q3 2013, except for the less than 10% housing loans that still faced an interest rate lower limit of 70% of benchmark rates, the pricing of other types of assets had been completely liberalized. The liberalization of the interest rates on the assets side of banks' balance sheets was basically accomplished by July 20th, 2013.

On the liabilities side, there were four major categories, i.e. deposits, issuance of financial bonds, borrowing from the central bank and interbank business. As of June 7th, 2012, the lower limit of deposit rates was removed and the cap was the benchmark interest rate. The issuance of financial bonds and interbank business had already achieved market-oriented pricing. Borrowing from the central bank and others were not included in the scope of reform.

Figure 2-3 The progress of interest rate liberalization based on banks' liabilities



On June 8th, 2012, the ceiling of RMB deposit rates was raised to 1.1 times the benchmark interest rates. Before this adjustment, at the end of Q1 2012, the deposits accounted for 80.8% of banks' liabilities and a ceiling was imposed on deposit rates which were the benchmark rates. The issuance of bonds accounted for 9.6%, and the interbank business accounted for 9.8%, and both types had accomplished marker-oriented pricing. After the adjustment, at the end of Q3 2012, the deposits accounted for 80.7% of banks' liabilities with a cap of 1.1 times benchmark rates. The issuance of bonds (10.1%) and the interbank business (9.1%) had accomplished interest rate liberalization.

On Nov 22nd, 2014, the ceiling of RMB deposit rates was raised to 1.2 times the benchmark rates. At the end of Q3 2014 before this adjustment, the deposits accounted for 76.7% of banks' liabilities with an interest rate ceiling of 1.1 times the benchmark rates. The issuance of bonds accounted for 10.2% and the interbank

business accounted for 11.4%, and both types had achieved market-oriented pricing. At the end of Q4 2014 after this adjustment, the deposits accounted for 75.1% of banks' liabilities, with an interest rate upper limit of 1.2 times benchmark interest rates. The issuance of bonds (10.1%) and the interbank business (11.6%) had both accomplished interest rate liberalization.

On Mar 1st, 2015, the ceiling of RMB deposit rates was raised to 1.3 times the benchmark interest rates. At the end of Q1 2015, the deposits accounted for 77.6% of banks' liabilities, with an interest rate upper limit of 1.3 times the benchmark rates. The issuance of bonds (8.3%) and the interbank business (6.1%) had both accomplished interest rate liberalization.

On May 11th, 2015, the ceiling of RMB deposit rates was raised to 1.5 times the benchmark rates. At the end of Q2 2015, the deposits accounted for 77.4% of banks' liabilities, with an interest rate upper limit of 1.5 times the benchmark interest rates. The issuance of bonds (8.1%) and the interbank business (6.4%) had both accomplished interest rate liberalization.

On Oct 24th, 2015, the ceiling of RMB deposit rates was removed, and the liberalization of interest rates on banks' liabilities was successfully accomplished.

II. Status Quo of China's Interest Rate System

China's interest rate regime has three levels: central bank interest rates, financial market interest rates, and commercial banks' deposit and lending rates. Central bank interest rates refer to the interest rates of the central bank's monetary policy tools, such as the interest rates of open market operations, interest rates of required reserves

and excess reserves, refinancing rates, rediscount rates, benchmark rates of financial institutions' deposits and loans, and interest rates of innovative liquidity management tools (e.g. SLF, MLF and PSL). The interest rates in the financial market refer to the interest rates of various products in the financial market, including money market rates and medium- and long-term interest rates. Money market rates include interbank offered rates, interbank bond repo rates, short-term bill rates and short-term commercial paper rates. The medium and long-term interest rates include bond yields and rates on medium-term notes. The interest rates of commercial banks' deposits and loans refer to the interest rates of savings from or loans to institutions or individuals.

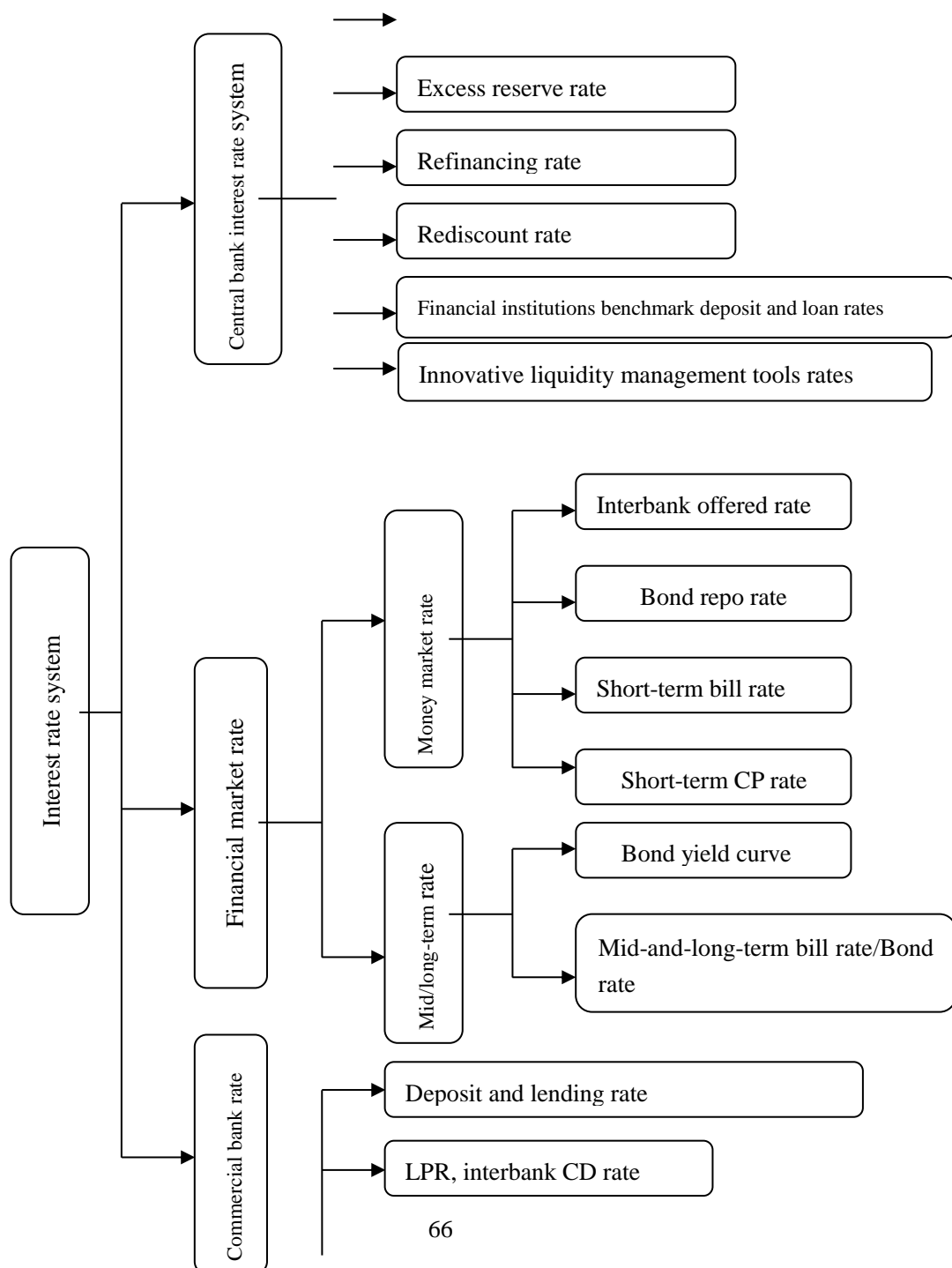
A. Central bank interest rate system

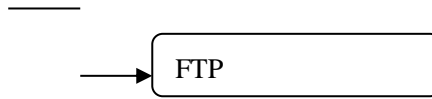
The open market operation is a crucial monetary policy tool of the PBOC. China's open market bond operations include repos, spot trade and issuance of central bank bills. Currently, the interest rate of the open market operations and that of the money market move in the same direction, and the lower limit is the central bank's excess reserve rate, while the upper limit is the rediscount rate.

The reserve rate refers to the interest rate that the central bank pays to the financial institutions for their reserve deposits. Required reserves and excess reserves had the same interest rate before 1996, but in August that year, the PBOC started to implement different interest rates for required reserves and excess reserves, and lowered the rates from 8.82% to 8.28% and 7.92%, respectively, and then to 7.56% and 7.02% respectively, in 1997. Before 1998, the deposits from commercial banks were categorized as general deposits and provisions, and the two accounts were merged into one reserve account in March 1998, and the interest rates of the two accounts were lowered from 7.56% and 7.02%, respectively (7.35% at weighted

average level), to 5.22%. After four rounds of adjustment, the interest rate of the required reserves declined to 1.89% in February 2002. In December 2003, the PBOC again reformed the system, adopting an approach of one account and two interest rates for required reserves and excess reserves of financial institutions. Excess reserve rates actually served as the lower limit of money market interest rates.

Figure 2-4 An illustration of China's interest rate system





Refinancing refers to credit that is provided by the central bank to commercial banks. The central bank could signal changes in its monetary policy stance to the public and commercial banks by adjusting the refinancing rates and in this way affect public expectations. To improve the central bank's interest rate formation mechanism, enhance its ability to guide market rates, streamline the relations between the central bank and borrowers, and establish a scientific, effective and transparent refinancing management system, the PBOC started to implement a floating refinancing rate system in March 2004. Based on the benchmark refinancing (rediscount) interest rates, the central bank could timely set and declare the floating points, which enhanced the central bank's ability to adjust refinancing (rediscount) rates in line with the economic and financial situation. The interest rates of special-purpose refinancing loans beyond the central bank's approved limit and rates of refinancing loans for financial stability were 0.5 percentage points more than the weighted average rates of seven-year treasury bonds in the year before the issuance. The interest rates of refinancing loans for financial institutions' position adjustment and short-term liquidity support were 0.63 percentage points more than the weighted average rates, and the rediscount interest rates were 0.27 percentage points more than the weighted average rates. The central bank also aimed to further improve macro regulation, standardize refinancing, and play a greater role in liquidity management and credit structure optimization. And for these purposes, the PBOC adjusted its categorization of refinancing loans, dividing the original liquidity refinancing into liquidity refinancing and credit policy support refinancing while keeping the classifications of financial stability refinancing and special-purpose policy refinancing in 2014. Liquidity refinancing and SLF

established in 2013 were meant to provide liquidity support to financial institutions that could meet macro-prudential requirements; credit policy support refinancing included the agricultural refinancing and small and medium institutions refinancing (refinancing for small and medium financial institutions).

Rediscount rates refer to the rates when commercial banks apply to the central bank for another discount of their holdings of discounted bills. In the infancy stage of the central bank's rediscount business, rediscount rates could float downward by 5% to 10% of banks' lending rates at corresponding categories over the same period. Since May 1996, the rediscount rate was allowed to float downward by 5% to 10% of the refinancing rates at corresponding categories over the same period. Since March 1998, the PBOC reformed the formation mechanism of rediscount rates and discount rates, and stipulated that rediscount rates be decided by the central bank and discount rates be based on rediscount rates. On Mar 25th, 2004, upon approval by the State Council, the PBOC started to implement a floating rediscount rate system.

To improve the effect of the monetary policy, prevent liquidity risk in the banking system and enhance the effectiveness of controls over money market interest rates, the PBOC initiated open market Short-term Liquidity Operations (SLO) and Standing Lending Facility (SLF) at the beginning of 2013. As a necessary complement to regular open market operations, the SLO was mainly based on short-term repurchase operations within seven days and market-oriented interest rate bidding. The SLF aimed to meet the large long-term liquidity needs of financial institutions. The longest duration of SLF is three months and its interest rate is determined in accordance with monetary policy and the method of issuance. To maintain stable and moderate liquidity in the banking system and support the appropriate growth of credit, in

September 2014 the PBOC created Medium-term Lending Facility (MLF) as a monetary policy tool to provide medium-term base money. In September and October 2014, the PBOC provided 500 billion RMB and 269.5 billion RMB to state-owned commercial banks, listed commercial banks, large urban commercial banks and rural commercial banks through the MLF, with a three-month duration and 3.5% interest rate. This provided liquidity and a medium-term policy interest rate, guided commercial banks to reduce lending rates and social financing cost, and support the growth of the real economy. In June 2014, the PBOC created Pledged Supplementary Lending (PSL), to guide medium-term interest rates based on the rates commercial banks received from the central bank with their pledged assets. To reduce high corporate financing cost, the PBOC modestly reduced the PSL interest rates in September 2014.

B. Money market and bond market interest rates

China's money market mainly consists of the interbank lending market, interbank bond market and commercial bill market. The interbank lending market and bond market constitutes the main body of money market transactions, of which pledged repo are the major part and the interbank lending rates and interbank pledged repo rates are the main money market rates.

Since 1986 when China allowed specialized banks to lend to each other, the interbank lending market based on financing centers established by local banks has been developing rapidly. In January 1996, the PBOC required that all interbank lending business must be processed via a national interbank network, thus officially establishing the interbank lending market and the interbank offered rates (Chibor). Financial institutions conducted short-term credit-based lending business through this

market with four months as the longest maturity, which in 2007 was extended to one year.

On January 4th, 2007, the National Interbank Funding Center officially launched a new money market benchmark interest rate – Shanghai Inter-bank Offered Rate (Shibor). Currently, the Shibor has eight maturities: overnight, one week, two weeks, one month, three months, six months, nine months, and one year. In the beginning, Shibor was calculated from rates quoted by 16 banks, excluding the two lowest and the two highest. In December 2012, two more banks joined the quotation, and Shibor was calculated excluding the four lowest and the four highest.

Table 2-1 China's money market

In trillions

	2007	2008	2009	2010	2011	2012	2013	2014
Interbank Lending	10.70	15.00	19.40	27.90	33.40	46.70	35.50	37.70
Interbank Bond Repo	44.8	58.1	70.3	87.6	99.5	141.7	158.2	224.4
o/w Pledged	44.07	56.38	67.70	84.65	96.66	136.62	151.98	212.41
Interbank Bond Spot	15.60	37.10	36.51	64.00	63.60	75.20	41.60	40.36
o/w Less than one year	n.a.	n.a.	n.a.	14.4	19.3	22.5	10.58	n.a.
Exchange Spot	0.18	0.37	0.34	0.37	0.47	0.59	1.009	1.49
Exchange Repo	1.86	2.43	3.59	6.62	20.45	36.85	63.07	90.18
Issuance of Bills of Exchange	5.87	7.1	10.3	12.2	15.1	17.9	20.3	22.1
Discounting of Bills of Exchange	10.11	13.50	23.20	26.00	25.00	31.60	45.70	60.70
Quotations in the Interbank Bill Market	20.45	53.37	66.56	11.00	10.88	15.79	20.87	18.76

o/w Rediscounting	19.75	40.59	62.07	4.93	3.78	7.80	12.16	10.61
Repo	0.69	12.77	4.49	6.07	7.10	7.99	8.71	8.09

Before 1997, China's bond market consisted mainly of the exchange market and bank counter certificate treasury bond market. Due to the lack of regulatory experience and high market risk at the initial stage², the PBOC required commercial banks to exit the exchange bond market and established the interbank bond market in June 1997. Financial institutions were largely engaged in bond transactions and repurchase business in the interbank bond market. The repo transactions were divided into pledged repo and buyout repo: Pledged repo requires a freeze of pledge during transaction; buyout repo has the features of credit transaction. The pledged repo has 11 maturities: one day, seven days, 14 days, 21 days, one month, two months, three months, four months, six months, nine months, and one year. Buyout repo was initiated in May 2004 with seven maturities: one day, seven days, 14 days, 21 days, one month, two month and three months.

Since June 1997 when the PBOC required commercial banks to exit the exchange bond market, the bond market featured a landscape with the co-existence of the interbank market, the exchange market and the bank counter market, and the combination of the floor market and OTC market. In the past 10 years, China's bond market has achieved rapid development with more market participants, more innovative products, more active transactions, more liquidity and more reasonable pricing. In particular, the introduction of short-term commercial paper in 2005 and medium-term notes in 2008 greatly promoted the development of interbank bond market. At present, the interbank bond market has become the main channel of debt

²Affected by the "327 Accident" on government bond futures, the exchange market was nearly suspended in the mid-1990s.

financing in China. The interbank market is also the main platform where the central bank carries out open market operations for indirect monetary control. According to BIS statistics, China's bond market has grown to be the third largest in the world, after the U.S. and Japan. Since 1998 the interbank bond market has taken up a share of more than 90% of the total bond market, involving various participants such as securities firms, insurance companies, funds, and trusts. In terms of bond products, treasury bonds and bonds issued by policy banks are the main products in the market, accounting for 35.1% and 34.6% respectively³. The medium- and long-term treasury bond yield curves and the Shibor formed a complete set of benchmark yield curves of the financial market.

China launched the commercial bill business officially in 1986, and this business was mainly conducted over-the-counter at specialized agencies in some major cities. In 2003, China Commercial Paper Network (chinacp.com.cn) was launched by China Foreign Exchange Trade System and National Interbank Funding Center, and in 2009 an electronic commercial paper system developed by the PBOC was put into use. The infrastructure for a national bill market achieved rapid progress. The market gradually extended to commercial banks, policy banks, urban and rural credit cooperatives and other financial institutions and enterprises. The market has played a crucial role in serving the short-term financing needs of different enterprises. The interbank commercial paper market also started to grow, which greatly helped promote commercial paper financing and the negotiation of short-term notes of financial institutions.

On December 8th, 2013, the People's Bank of China issued *Provisional Regulations*

³Based on the classification criteria of the CCDC.

on Management of Interbank Certificates of Deposit, which took effect on December 9th. Subsequently, about 10 financial institutions, including the Bank of China, issued the first batch of interbank deposit products and initiated secondary market transactions one after another, establishing a bilateral offering market-maker system in the interbank certificate of deposit business. As the interbank certificate of deposit business is characterized by automation, standardization, high liquidity and transparency, it can provide more transparent and market-oriented pricing reference to long and medium-term Shibor rates, broaden financing channels for deposit institutions in the banking sector, and effectively promote the development of interbank certificate of deposit business. The development of interbank certificate of deposit business can provide reference for the steady and orderly promotion of interest rate liberalization.

C. Lending and deposit rates of commercial banks

When interest rates were regulated, the lending and deposit rates were determined by the central bank. During the liberalization process, the lending and deposit rates could fluctuate around the lending and deposit benchmark interest rates released by the PBOC, and the floating range was decided by the central bank.

In order to enhance the independent pricing ability of commercial banks, the People's Bank of China urged financial institutions to strengthen their pricing mechanisms. The current pricing mechanisms of commercial banks include the internal funds transfer pricing system (FTP) and the risk pricing mechanism.

The FTP refers to an operation model in which commercial banks transfer funds between internal fund center and business units based on rates set by external

benchmark price and their own business performance. The purpose of this system is to adjust business cost and profitability as well as regulate the balance sheets and capital structure. Currently, some banks have put the FTP model into practice. In terms of RMB interest rate products under the dual-track system, commercial banks usually adopt FTP with controlled interest rates and FTP with market-oriented interest rates to achieve internal transfer pricing. FTP with controlled interest rates refers to benchmark interest rates of various term structures published by the central bank, and FTP with market-oriented interest rates uses Shibor, central bank bill rates and treasury rates as the benchmark. Foreign currency FTP is generally based on basic FTP rates and some adjusting factors. Basic FTP rates use market yield curves of various currencies, such as Libor and Hibor, while the adjusting factors reflect the difference between domestic and overseas markets and the management requirements of commercial banks.

Risk-based pricing is a price management model which measures both risks and returns. Under the risk-adjusted framework, the interest rate is determined by the credit risk in the asset portfolio of banks. Risk-based pricing can help enhance risk coverage, reduce overall credit risk, improve earnings, optimize the credit asset structure and prevent moral hazard in asset pricing. The risk factors involved in the risk-adjusted loan pricing model include default rate, rate of loss from default, term structure, exposure to default risk and capital requirements imposed by the regulatory authorities. At present, most commercial banks in China have taken risk-based pricing into consideration when setting loan rates; they also consider funding costs, operational cost and risk compensation when setting the loan rate. The funding cost is regulated by the FTP pricing system and the operational cost is calculated by activity-based cost analysis. The core part is to calculate risk premium – estimating

the probability of distribution and exposure of credit risk based on the internal and external ratings and calculating the probability of default and probable loss in case of default. Due to a lack of continuous historical data, Chinese banks need to improve their calculations on default probability and default loss.

In recent years, with the deepening of interest rate liberalization, domestic banks have started to improve their interest rate pricing mechanisms and management. In large banks, such as ICBC, ABC, BOC and CBC, the interest rate pricing management is led by a number of management departments such as the asset and liability department or the accounting department; in national joint-equity commercial banks, the asset and liability management committee and financial department are established to develop pricing policies, and a hierarchical authorization system is set up to allow business units and branches to carry out pricing policies within their scope of authority delegated by the head office.

After July 2013 when the PBOC removed control on lending rates, the central bank established and enhanced the market-oriented interest rate pricing self-discipline mechanism to further improve the pricing mechanism of commercial banks, and introduced LPR (loan prime rate) centralized quotation and release mechanism. The LPR is the lending rate offered by commercial banks to their best customers, and rates on other customers can be set above it. In this regard, the LPR serves as a benchmark rate for commercial banks' loan pricing.

After October 2015 when the ceiling on deposit rates was lifted, commercial banks are no longer restricted in their decisions on deposit and lending rates and can independently determine prices in accordance with market principles. However, an interest rate formation mechanism based on market supply and demand has yet to be

set up. Under the current circumstances, the central bank will continue to publish benchmark deposit and lending rates to provide references for interest rate pricing to financial institutions.

III. The Interest Rate Transmission Mechanism in China

From the beginning of the reform to the removal of cap on deposit rates, China's interest rate regime showed a dual-track feature – the co-existence of both regulated rates and market-based rates. This section will elaborate on the interest rate transmission mechanism under the dual-track system.

A. Transmission and interaction between regulated interest rates and market-oriented interest rates

a. The influence of regulated interest rates on market-oriented interest rates

i. The interaction between regulated interest rates and market-oriented interest rates

The key of the dual-track system lies in the regulation on deposit rates, which is essential to the understanding of the transmission between regulated rates and market-oriented rates. A lower cap on deposit rates enables banks to acquire capital with lower cost and therefore provide loans to businesses with rates below the equilibrium level. The purpose of deposit rate regulation is to mobilize deposits at a relatively low cost, thereby stimulating investment and economic growth. It is for this reason that the adjustment of the upper limit of deposit rates has always been slow, which directly leads to a delay in the adjustment of lending rates. Low lending rates could push up demand and trigger excess liquidity and inflation. To restrain excessive credit expansion, the central bank had to take quantitative control rather than just

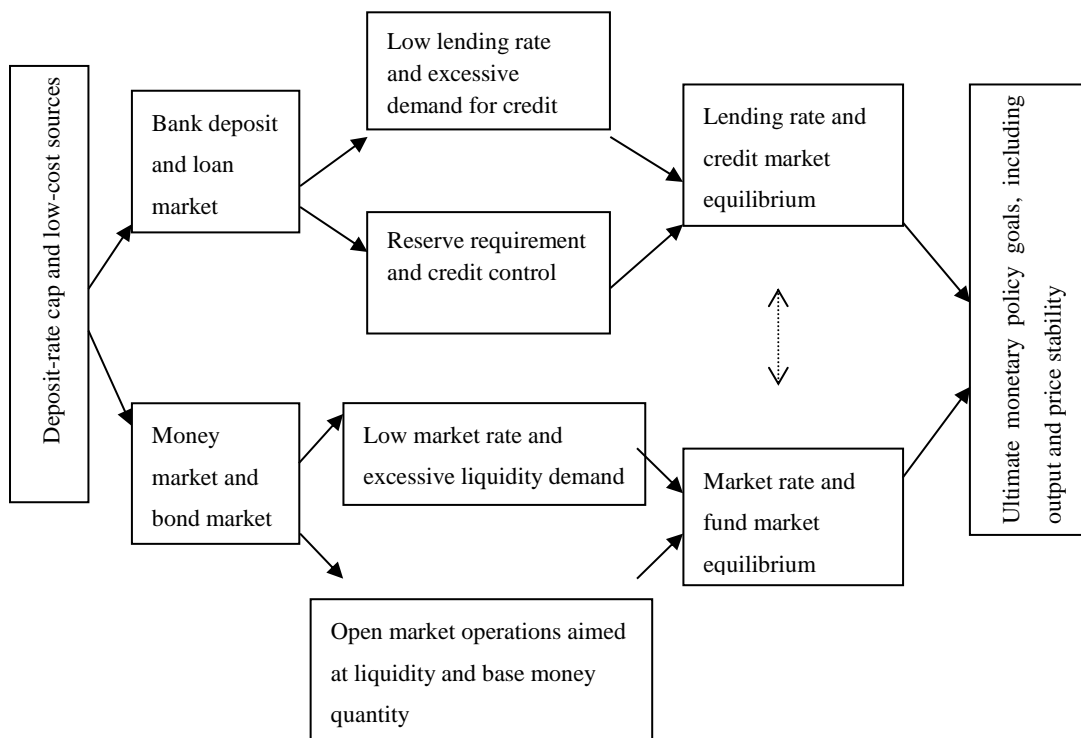
price leverage. By regulating reserve requirements and the scale of credit, the central bank was able to control the number and size of loans and therefore achieve some sort of equilibrium between supply and demand of credit at relatively low interest rates.

Due to credit controls, banks acquired more low-cost deposits than the loans they disbursed, and the excess capital was invested in the money market and bond market. The money market was the main place for liquidity management, where large banks were major creditors while small and medium financial institutions, such as urban commercial banks, were borrowers. Though interest rates in the money and bond markets had been fully liberalized, the banks were still willing to provide funds to borrowers at a lower price than outside markets. Borrowers in the bond market were mostly enterprises with high credit ratings, and they would turn to the credit market if the bonds were issued with high rates. Therefore, the funding market interest rates were generally significantly lower than loan rates. In the case of excess liquidity, low interest rates in the money and bond markets would further push up the demand for liquidity and credit expansion, and the PBOC had to issue central bank bills and carry out repos to soak up liquidity and maintain relatively stable interest rates in order to constrain demand for funds.

The ceiling on deposit interest rates helped push down interest rates in the credit, money and bond markets, whereas the central bank had to rely more on the quantitative monetary policy tools to achieve economic growth and stabilize consumer prices. Under the dual-track system, China's monetary policy transmission had been working both on the regulated track and the market track, and the two interacted with each other. When deposit and lending rates were under regulation, the adjustment of benchmark rates could directly affect the funding cost and further affect

the supply of and demand for credit, and the central bank had to use the quantitative tools such as the reserve requirement ratio and volume of credit to achieve an equilibrium level of credit. Meanwhile, the central bank aimed to regulate interest rates in the money and bond markets via open market operations so as to adjust supply and demand of capital. Studies (He and Wang, 2012, 2013) show that since the banking sector still prevailed in the dual-track system, there were arbitrage opportunities in the fund flow between the credit market and the money and bond markets. In this case, the control on deposit and lending rates and quantitative monetary policy tools had the biggest influence on the interest rates in the latter while open market operations (including the issuance of central bank bills) had a relatively small effect.

Figure 2-5 Interest rates transmission in the dual-track system



ii. Empirical analysis on the relations between benchmark deposit rates and money market

rates

Analysis of the dual-track system shows that the ceiling on deposit rates had suppressed interest rates in the money market and had generated excessive liquidity. By studying the relations between regulated deposit rates and money market rates, we aim to examine the transmission mechanism between regulated and market interest rates under the dual-track condition. Here we use Granger causality analysis based on a VAR framework.

In terms of indicators, we choose one-year deposit rate of financial institutions (Deposit 1y) as the indicator of the regulated interest rate and one-year Shanghai interbank offered rate (Shibor 1y) as that of the market interest rate. We take the monthly data of the two rates from January 2007 to December 2014 as our sample. ADF stationary test shows that both Deposit1y and Shibor1y are I (1) series and according to Sims, et al. (1990), if the variables are both integrated of order one and have a co-integration relationship, the variables could be included into the VAR system without model misspecification. Hence, we put Deposit1y and Shibor1y series into VAR and ran a Granger causality test. The SC principles confirmed that the lag intervals for endogenous is 2, that the characteristic root falls inside the unit circle, and the result is robust. The result of the Granger causality test is as follows:

Table 2-2 Granger causality test of regulated and market interest rates

VAR Granger Causality/Block Exogeneity Wald Tests

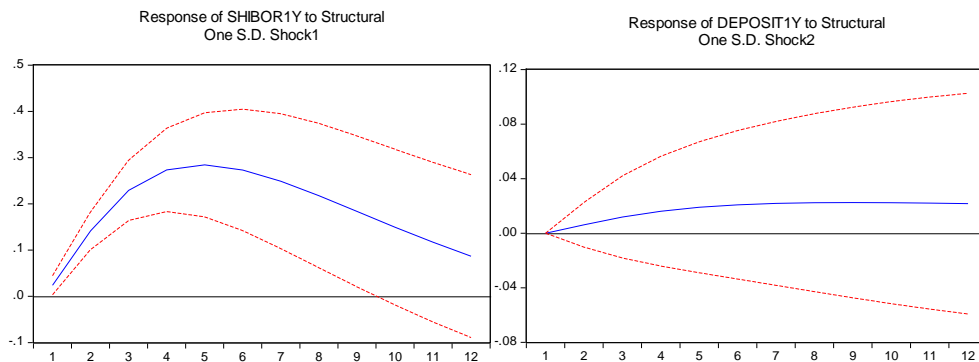
Dependent variable: Deposit1y

Dependent variable: Shibor1y

Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
Shibor1y	0.637171	2	0.7272	Deposit1y	102.9722	2	0.0000
All	0.637171	2	0.7272	All	102.9722	2	0.0000

It should be noted that the benchmark deposit rate is the Granger cause of Shibor 1y, and Shibor1y is not the Granger cause of one-year benchmark deposit rates, which indicates that the regulated deposit rate has an effect on the market rate, but not vice versa.

Figure 2-6 Structural impulse response functions of regulated and market interest rates



Based on the theoretical relations between the regulated interest rate and market interest rate, we could set up a structural VAR model and the relation between the structural residual u_t and the unconstrained residual ε_t in decomposition is shown as follows:

$$\begin{pmatrix} \varepsilon_t^{gap} \\ \varepsilon_t^{CPI} \end{pmatrix} = \begin{pmatrix} S_{11} & 0 \\ S_{21} & S_{22} \end{pmatrix} \begin{pmatrix} u_t^{gap} \\ u_t^{CPI} \end{pmatrix}$$

Based on the two variables' structural VAR models and impulse response functions, we find that the one-year Shibor rate responds positively to one unit structural shock of the deposit interest rate, and the maximum response appears after a five-month lag and gradually converges after fifteen months; on the contrary, the regulated deposit rates respond very weakly to one unit structural shock of one-year Shibor, and the response hovers around zero and gradually converges after 20 months, which further illustrates a definite causal relationship between the two rates.

b. Effect of market-oriented interest rates on regulated interest rates

As money market interest rates could be the opportunity cost of credit for some banks, it could have an impact on the loan rates in the banking system. With the expansion of the floating range of loan rates and the ensuing removal of regulation, the impact of money market rates on loan rates had been increasing. From Q4 2006 to Q2 2012, the correlation between overnight Shibor and the weighted average of general loan rates had reached 0.96 (Li, 2012). In 2013, due to high volatility in the money market and a surge of interest rates, many enterprises had to accept higher lending rates, and the proportion of loans with downward floating rates decreased significantly. At that time, the deposit rates could float upwards by 10% maximum, but due to hefty issuance of alternatives to bank deposits at market prices, there was an obvious linkage between their yields and money market rates. The expected yield of one-month WMP issued in mid and late June of 2013 increased from 4% at the beginning of June to 5.4%. Meanwhile, in terms of deposit rates alone, when deposit rates were allowed to float upwards by 10% maximum in mid-2012, only small- and medium-sized banks saw

upward floating of their deposit rates. However, when money market rates went up in mid-2013, large banks also saw the gradual floating of their deposit rates, which further demonstrated the effect of money market rates on deposit rates. As deposits are an important source of funding for commercial banks, increase of deposit rates would inevitably lead to rising lending rates, strengthening the impact of money market rates on then lending rates of commercial banks.

B. Transmission mechanism between the benchmark interest rate system and other interest rates

a. Market benchmark interest rates and interest rate liberalization

The market benchmark interest rate system plays a fundamental role in a country's interest rates system as a reference for the pricing of other rates. It mainly consists of short-term money market benchmark rates (currently dominated by the offering rates such as the U.K. Libor and China's Shibor) and medium-and long-term yield curve of market funds (mainly the treasury yield curve). In the process of interest rate liberalization, in addition to the liberalization of deposit and lending rates, China should also gradually transit to price-based monetary controls, straighten out the interest rate transmission mechanism, establish a deposit insurance system and develop interest rate risk management tools (Zhou, 2013). All these financial infrastructure developments cannot be achieved without a benchmark interest rate system. Only a well-recognized market benchmark interest rate system could replace the deposit and lending rates set by the central bank, based on which commercial banks could price their deposits and loans and perform effective risk management. Only by establishing a sound and comprehensive market benchmark interest rate system, can the central bank transmit short-term target rates to long-term interest rates

to achieve the ultimate goals of monetary policy. As the basis for the pricing of financial products, a comprehensive benchmark interest rate system can help manage interest rate risks, mitigate shocks caused by interest rate liberalization, and prevent systemic financial risks. Meanwhile, with the increasing openness of China's economy and its integration into the global capital market, the benchmark interest rate system can play an important role in making full use of the interest rate parity mechanism, dealing with the impact of short-term international capital flows, promoting domestic economic coordination and the internationalization of RMB.

It should be noted that the development of the benchmark interest rate system is important in many ways: deepening the market-oriented reform of interest rates, improving monetary policy transmission efficiency and the pricing mechanism of financial products, promoting the innovation of financial products, enhancing risk management of financial institutions, further refining the RMB exchange rate formation mechanism, pushing forward RMB internationalization, and sustaining the healthy, stable and orderly development of the financial system as a whole. China has long lacked a complete system of benchmark yield curves, especially due to the limited variety of short-term bond products, inadequate term structure and slow development of a money market benchmark interest rate system, which to some extent restricted the progress of interest rate liberalization (Zhou, 2004).

A complete benchmark yield curve consists of money market rates and medium and long-term benchmark rates, among which money market benchmark rates less than one year is more important. According to the expectation theory of interest rate term structure, there is a long-term equilibrium co-integration relationship (Campbell and Shiller, 1987) between the short-term interest rates and the long-term interest rates,

and the shape of the yield curve can reflect the market expectation on inflation and economic growth (Fama, 1990; Estrella and Hardouvelis, 1991). As the basis for pricing of fixed income products and other products and the reference for monetary policy operations, the development of a money market benchmark interest rate system is of greater significance.

b. The benchmark interest rate system in the financial market and benchmark loan rates

i. Shanghai Interbank Offered Rate (Shibor) as the money market benchmark interest rate

According to the definition of the market benchmark interest rate, it is supposed to have the following attributes: does representative of the market, benchmarking, stable, risk-free, have a complete term structure and is relevant to the real economy. Market representativeness (or liquidness) means that the benchmark rate is formed by major market players actively engaged in market transactions, and there's a high level of correlation between the benchmark rate and other major market interest rates. Benchmark means that the rate plays a key and dominant role in the interest rate system, which could effectively influence other money market rates. Stability (or controllability, immunity to interference) means that the benchmark rate is sensitive to the market but can resist short-term disruptive factors so that the central bank can effectively affect the benchmark rate via monetary policy measures. Risk-free means that theoretically the benchmark rate should have the features of a risk-free rate, as the price of financial products is actually the present discounted value of future cash flows with various uncertainties considered, namely, the risk-free rate. Complete term structure means that the benchmark rate should be a yield curve of full term so that it

can serve as the benchmark for the pricing of financial products of all terms. Correlation to the real economy means that the benchmark rate is able to affect macroeconomic variables and help achieve the goals of monetary policy.

Market representativeness and the benchmarking function are the core attributes of the money market benchmark rate. Only a rate determined and accepted by major market players could become a benchmark and used to determine financial flows arising from contractual agreements, price financial products, assess the performance of portfolios, and influence other major money market interest rates⁴. The importance of the other four attributions decreases successively in assessing money market benchmark rates, as they are the extension of the core attributions.

Drawing from international experience, China's money market benchmark rate – Shanghai Interbank Offered Rate (Shibor) - started a trial operation on October 8th, 2006, and was officially launched in January 2007. In terms of market representativeness, Shibor was the arithmetic average of interbank interest rates offered independently by a group of banks with high credit rating, transparent disclosure system and active trading. This group covers state-owned commercial banks, joint-equity commercial banks, urban commercial banks and foreign banks, and are different in their asset size, business model, and competitiveness, which ensures their offers reflect market liquidity. Data show that these banks have engaged in about 80% of money market transactions since 2007⁵, which proves Shibor's strong market representativeness.

Table 2-3 Application of Shibor in financial product pricing

⁴ The Wheatley Report of Libor: Final Report, www.hm-treasury.gov.uk, Sep 28th, 2012

⁵See “China Monetary Policy Report” and Shibor work conference documents over the years, www.pbc.gov.cn.

Unit: (100 million RMB, %)

	2007	2008	2009	2010	2011	2012	2013	2014
Floating rate bonds	990 (18)	122 (4.6)	728 (19)	552 (13)	1303 (26.5)	n.a.	1793 (59)	n.a.
Short-term financing bonds	1376 (41)	1786 (42)	1272 (28)	2414 (37)	2418 (31)	3888 (46)	4453 (53)	10341 (98)
Corporate bonds	1657 (97)	2347 (100)	4252 (100)	3621 (100)	2499 (100)	6490 (100)	4715 (100)	6892 (100)
Interest rate swap	285 (13)	899.2 (22)	1292.6 (28)	6046.4 (40.3)	12175.6 (45.5)	14513.6 (50)	9056.3 (33.2)	7343.2 (18.2)
Forward Rate Agreement	11 (100)	114 (100)	60 (100)	34 (100)	3 (100)	2 (100)	0.5 (100)	n.a.

Note: (Number) refers to the share in total transactions

Source: China Monetary Policy Implementation Report

Due to common trading practices, currently the pricing of many financial products is based on the pledged repo rate, but Shibor is also widely used in the market-based pricing of financial products. In the first official year after Shibor was launched (2007), over 82% of interbank lending and repurchase transactions referenced Shibor, and interest rate swaps, forward rate agreements and other innovative financial products based on Shibor were traded actively. Moreover, businesses such as discount of bills, transfer discount of bills and interbank certificates of deposit all established a market-based pricing mechanism with Shibor as the benchmark, and the internal funds transfer pricing of offer banks was also linked to Shibor. Since 2008, the PBOC

had signed a total of 1.67 trillion RMB currency swap agreements based on Shibor with central banks of Malaysia and South Korea. At present, pricing based on Shibor has been increasing in the financial market and the relations among various interest rates are becoming more reasonable and clear. Shibor's status as a benchmark rate in the money market is well established.

Moreover, compared with the interbank rates and the repo rates, Shibor has proven its advantages in terms of risk and term structure. The interbank lending was a kind of credit transaction rather than a risk-free transaction. In 1996 when China Interbank Offered Rate (Chibor) was launched, China wanted it to function as a money market benchmark rate, but Chibor is the weighted average of interbank offered rates based on trading records. It mainly refers to short-term interbank loans less than seven days due to inactivity of transactions of longer terms. The same problem can be found in pledged repo transactions. Though pledged repo with bonds as guarantee carries less credit risk, its many varieties cover treasury bills, financial bonds, mid-term notes and other bonds with different risk levels, and therefore pledged repo rate is not an entirely risk-free rate. Shibor is a simple interest rate and wholesale interest rate without guarantee and has eight maturities from overnight to one year, forming a complete interest rate curve with smooth features. The offer banks were usually high rating organizations with low credit risks. Though Shibor is based on offered rates and follows the practice of major benchmark rates such as Libor (for example, the banks offer prices at a fixed time of each day, and the final rate is the arithmetic average of all offers excluding the highest and lowest one), Shibor pays a lot of attention to supervision and risk prevention in terms of institutional arrangements, emphasizing the authenticity of offers and introducing third-party evaluation mechanism. Annual assessment is implemented to ensure the quality of offers, with the elimination of the

least qualified offer. China's special conditions and institutional arrangements determine that Shibor has unparalleled advantages over Libor. In this regard, Shibor's low risk level and high-quality offers can support its role as a benchmark interest rate (Zhang, 2011).

ii. The mid and long-term bond yield curve is improving

According to the definition of the yield curve, the market benchmark rate should have a full-term structure. A yield curve covering interest rates of various maturities is needed for the purpose of asset pricing and valuation of derivatives. However, in reality, not all maturities are based on transactions, as most transactions in the money market are concentrated on overnight transactions and rarely on mid and long-term (three months to one year) transactions. The launch of Libor in the 1980s was mainly to address the problem of pricing of derivatives (Zhang, 2011). Similarly, the market interest rates of mid and long-term treasury bonds above one year also faced the problem of incomplete term structure. Especially in China, the banks as major players of the money market hold around 70% of total treasury bonds, and national banks hold about 80% of all banks, and thus the bank transactions have a very big impact on the bond market. Meanwhile, insurance companies and pension funds, which are also the main investors of treasury bonds, usually hold them until maturity rather than selling in the secondary market; they do this for the purpose of long-term financial asset allocation, but it can directly affect the formation of market-based bond prices. Moreover, the European and U.S. markets have a much larger scale of OTC interest rate derivatives than underlying assets⁶, and in comparison China still has a long way

⁶According to BIS statistics, the turnover of OTC interest rate derivatives at end 2013 was U.S.\$584.4 trillion (of which, interest rate swaps account for 78.9%). Meanwhile, the global bond market was only U.S.\$ 90.9 trillion US dollars. At the end of 2013, China's bond market trading reached a historical high of 30.6 trillion RMB, while the maximum turnover of interest rate derivative was only 2.92 trillion RMB in 2012, and most of the trading was

to go. In other words, China's bond market (especially the treasury bond market) already has a certain width, but it still needs to go deeper. It is for this reason that the 3rd Plenum of the 18th CPC Central Committee marked the improvement of treasury bond yield curve as an important agenda.

The treasury bond yield curve serves as the basis for a country's market-based financial system and as the benchmark for the pricing of other kinds of financial assets; it is also an important indicator of economic and financial situation and expectations. As an infrastructure provider to the bond market, the China Central Depository and Clearing Co., Ltd. (the CCDC) is the first to compile and release RMB treasury bond yield curve, relying on its massive data and close links to the market.

Currently, almost all domestic studies on China's interest rate term structure adopt NS or NSS polynomial fitting proposed by Nelson and Siegel (1987) and Svensson (1994) to estimate yield curves (Zhu and Chen, 2003; Kang and Wang, 2010). This method works better for relatively mature bond markets in developed countries and is adopted by the central banks of many developed countries⁷. The outliers would reduce the effect of spline fitting, and unusual transactions are largely not studied in domestic research. Practically it's rather difficult to identify unusual transactions. Methods such as subjective judgment, relative position and zero-volatility spread can be inaccurate. Though China has made great progress in the institutional development of the bond market in recent years, the market-oriented reform is still at an early stage with many specific transaction arrangements based on consideration of various interests, and thus a yield curve obtained from fitting method might not be ideal.

interest rate swaps.

⁷Except for the U.S. and Japan, most central banks and treasury departments in developed countries use NS or NSS to compile yield curve, see BIS(2005).

To ensure the accuracy of the yield curve, the CCDC decided to eliminate abnormal prices exercising subjective judgment. To identify abnormal prices, the CCDC compares the daily clearing prices of each type of bond to the yield curve of the last working day. Clearing prices that deviated from the yield curve and that couldn't be explained by policies of that day or by related financial factors might be deemed abnormal prices. The CCDC also eliminates abnormal prices caused by buy-out repo or block trade. For possible defensive offer that might occur in bilateral quoting with higher credibility, the CCDC makes decision on a case by case basis taking into consideration factors such as whether the bilateral quoting is continuous and whether the bid-ask spread and yield spread is too large. The CCDC has an advantage in acquiring information and monitoring possible abnormal transactions. In terms of curve construction methods, the CCDC developed in 2006 a new model for constructing the bond yield curve based on Hermite interpolation.

Hermite interpolation is characterized by smoothness, flexibility and stability. It can reflect all kinds of curves, and a change at certain point will not affect the whole yield curve. Therefore, the Hermite model could be applied to the bond market of less developed countries (which have more abnormal transactions, big influence of liquidity and higher volatility). Practically, the Hermite model is suitable for both Chinese and the developed markets. For example, the U.S. treasury yield curve is constructed by the Hermite model⁸. Related researches show that China's treasury bond yield curve can effectively support the expectation theory and contains large amount of macroeconomic information (Li, 2012; Jiang and Li, 2013). In this regard, it can function as a medium and long-term market benchmark rate, providing necessary conditions for price-based monetary control.

⁸“Treasury Yield Curve Methodology”, Office of Debt Management, Department of the Treasury, Feb 26th,2009, <http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/yieldmethod.aspx>

iii. Self-discipline mechanism for market interest rate pricing and loan prime rate (LPR)

After the control on interest rates is lifted, the pricing ability of financial institutions and a market self-discipline mechanism are crucial to the orderly competition and stability of the financial market. To maintain fair competition and promote healthy development, financial institutions should rely on self-discipline in the money and credit markets under the premise of rules and regulation. Based on the self-discipline mechanism, financial institutions are organized to offer lending rates to their best customers, which work as a reference for the pricing of credit products. It is of great importance to establish a self-discipline mechanism for market rate pricing and a centralized quotation and publishing mechanism for loan prime rates: First, it could effectively encourage financial institutions to strengthen financial constraints and achieve scientific and reasonable pricing; second, the establishment of credit market prime rates can provide a reference to the market-based pricing of credit products; third, it could help further develop the money market, regulate inter-bank business and prevent financial risks; fourth, it could strengthen self-discipline on pricing and maintain fair and orderly market competition.

The first batch of financial institutions involved in this self-discipline mechanism included 10 commercial banks such as the ICBC. Four special working groups were set up under this self-discipline framework: The due diligence and comprehensive evaluation group, the LPR group, the interbank certificate of deposit group and the Shibor group. These four groups have played an active role in establishing an LPR quotation mechanism and issuing interbank deposits. In July 2014, another 93 banks joined the self-discipline mechanism, which contributed greatly to the further improvement of product pricing and rate quotation, including Shibor and LPR.

Combining international experience with China's practice, a centralized quote and publish mechanism of LPR was launched in October 2013. The LPR refers to lending rates offered by commercial banks to their best customers; it also serves as the basis for other lending rates. According to the centralized quote and publish mechanism, an authorized publisher will calculate the weighted average of LPRs offered by commercial banks and release it to the public. At the early stage, the published LPR is of one-year maturity.

The National Interbank Funding Center (NIFC) is the designated publisher for LPR, and the first quotation group consists of nine commercial banks. On each work day, the NIFC would exclude the highest and lowest quotations from commercial banks and calculate the weighted average of the valid quotations, and then publish the rate on the Shibor website. The weight is the ratio of each quotation bank's RMB loan balance to the overall balance of all banks at the end of last quarter. The self-discipline mechanism will evaluate the quality of quotations each year to enhance the credibility of LPR.

As an important component of the self-discipline mechanism, the centralized quotation and publish mechanism of LPR helps expand and supplement the Shibor mechanism in the credit market. Currently, the LPR system is operating steadily and its application in the pricing of credit products and derivatives is ever expanding. Statistics show that commercial banks had issued more than 30 billion loans based on LPR, and interest rate swaps based on LPR is also taking off.

c. Transmission mechanism between benchmark interest rate and other interest rates

In a market-based system, the central bank chooses the short-term interest rate as the

main policy target, and aims to influence the pricing of financial products and the deposit and lending interest rates by adjusting the market benchmark interest rate. This will further change people's investment and consumption behavior and finally help achieve the ultimate policy goals of price stability and economic growth.

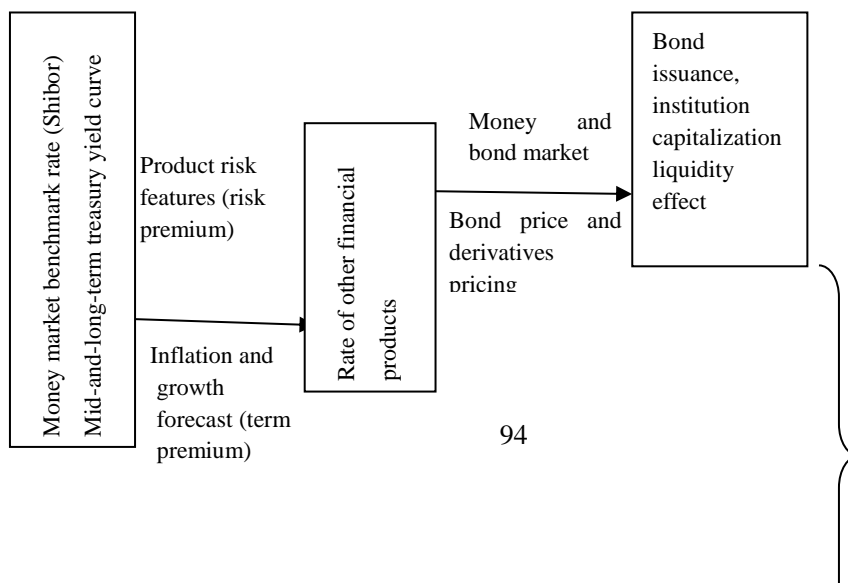
In terms of the transmission between the benchmark interest rates and other interest rates, it is achieved by the movement in liquidity and valuation. Other interest rates are determined by adding certain term premium and risk premium to the benchmark rates based on expectations of future inflation and economic growth as well as risk judgment. The adjustment of benchmark rates can effectively affect liquidity in the financial market and then the prices of fixed income products and stock products. The changing prices of financial assets can then influence the savings and consumption behavior of people and investment behavior of corporations through the wealth effect, and ultimately influence the real economy. In this way, a complete interest rate transmission chain from the market benchmark yield curve to financial market interest rate (bond and stock prices) and then to consumption and investment (real economy) is formed.

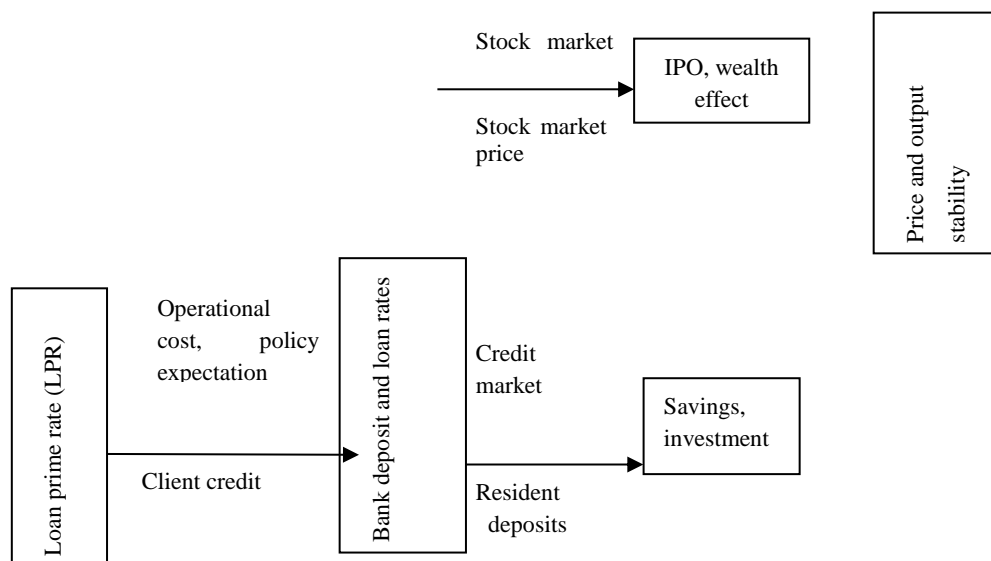
The U.S. and other developed countries with a market-based interest rate system usually price their commercial loans by the prime rate model. The banks offer their prime rate to their best customers based on the risks of financial products and operation cost. The prime rate is linked to the central bank's benchmark interest rate and follows the movement of policy interest rate target, while other interest rates are determined by adding certain risk and term premium to the prime rate based on customer credit and product specification. For instance, the prime loan rate offered by the commercial banks in the U.S. is about 300 basis points above the federal fund rate.

Given market competition, the U.S. commercial banks seldom adjust their prime rates before the central bank changes its interest rate policy. The determination of deposit rates is similar to that of loan rates, which is determined by the account balance and liquidity of different customers. In this way, a complete monetary policy interest rate transmission chain from the prime rate to deposit and lending rates and then to the real economy and inflation is formed.

It should be noted that the base rates of banks in a market-based system is totally different from the deposit and lending benchmark rates of the central bank in China. Although in October 2014 China had removed the cap on the deposit rates, the benchmark lending rates set by the central bank actually draw up a “quasi loan prime rate curve” for financial institutions, which to some extent restricts the pricing capability of financial institutions on various term premiums. What’s more, the rising interest rates may not be able to fully reflect the risks of loans and thus credit rationing is likely to occur. When the interest rate is fully liberalized, the commercial banks can establish a sound pricing system and achieve the effective allocation of credit resources through the price leverage.

Figure 2-7 Transmission mechanism between the benchmark interest rate and other interest rates





d. Empirical analysis of the benchmark interest rate transmission mechanism in the financial market

i. Correlation between Shibor and other major trading rates in the money market

The money market benchmark interest rate should represent the overall performance of the market. It should be composed of major market players with active participation in the market. In January 2007, China officially launched the Shanghai Interbank Offered Rate (Shibor), and after eight years' running, Shibor has established its role as the benchmark rate in the money market. The movement of Shibor is highly consistent with that of Repo and Chibor. In terms of the most traded overnight and seven-day interest rates in China's money market⁹, Shibor, Repo and Chibor are highly correlated. It shows that there's a strong correlation between the seven-day

⁹From 2007 to 2014, overnight and seven-day pledged repo accounts for 52.2%, 63.9%, 77.8%, 80.0%, 75.4%, 81.2%, 79.1%, 78.6% and 35.9%, 26.7%, 15.4%, 14.3%, 16.2%, 12.6%, 12.9%, 14.1%, respectively, of the total transactions. Overnight and seven-day borrowing accounts for 75.4%, 70.8%, 83.5%, 87.9%, 81.7%, 86.2%, 81.5%, 78.2% and 20.5%, 23.3%, 11.0%, 8.7%, 12.7%, 8.9%, 12.4%, 16.2%. Overnight and seven-day are the two most-traded maturities in China's money market.

Shibor and Repo and interbank offered rates of the same period, and the coefficient is above 0.99.

Table 2-4 Correlation between overnight and seven-day Shibor and repo and interbank interest rates

	Shibor1	Repo1	Chibor1		Shibor7	Repo7	Chibor7
Shibor1	1			Shibor7	1		
Repo1	0.9998 (494.8) ***	1		Repo7	0.9998 (457.9)) ***	1	
Chibor1	0.9998 (526.8) ***	0.9997 (393.0) ***	1	Chibor7	0.9969 (123.1)) ***	0.9969 (122.6)) ***	1

Note: The sample period was from Jan 2007 to Dec 2012, the number in the brackets was t, and ***,** meant that the Pearson significance level was 1%.

In terms of institutional arrangements, the central bank has always emphasized regulation and risk prevention. A third-party evaluation mechanism was introduced to ensure the quality of quotations and maximize the effect of money market benchmark interest rates (Zhang, 2011). Theoretically, if the Shibor quote is accurate, then the mean and variance should be the same for the quoted and actual rates. In addition to calculating the correlation of the two, we can also assess how representative the Shibor is of the market rate through the mean and variance analysis. Here, we mainly use variance analysis to construct the F-statistic to test the equality of the mean and variance of the two rates. Figure 2-5 shows that the value of p in the mean and variance test between overnight/seven-day Shibor and repo/interbank interest rate is quite large. Only the p value of seven-day Shibor average equality test is close to 0.85

while the rest are all above 0.98, which proves that Shibor can represent the market well.

Table 2-5 Mean and variance equality test between overnight/7-day Shibor and repo/interbank offered rate

		Test method	Degree of freedom	Statistic	P value
Overnight rate	test for the Equality of means	Anova F-test	(2, 285)	0.00687 7	0.9931
		Welch F-test*	(2, 189.998)	0.00684 4	0.9932
	Test for the equality of variance	Bartlett	2	0.00625 8	0.9969
		Levene	(2, 285)	0.00193 4	0.9981
		Brown-Forsythe	(2, 285)	0.00188 2	0.9981
	Seven-day rate	Test for the equality of means	Anova F-test	(2, 285)	0.1734
Welch F-test*			(2, 189.998)	0.1719	0.8422
Test for the equality of variance		Bartlett	2	0.0243	0.9879
		Levene	(2, 285)	0.0100	0.9900
		Brown-Forsythe	(2, 285)	0.077	0.9923

Note: The sample period was from Jan 2007 to Dec 2014.

ii. Effect of treasury bond yield on corporate bond yield

When the interest rate is fully liberalized, financial institutions can price their products based on the benchmark interest rate, while also take into consideration factors such as macroeconomic growth, inflation expectation, their own operation cost and the risk features of the products (customer credit). Due to the lack of necessary data (China only removed regulation on loan rates in recent years), here we try to test the interest rate transmission mechanism by analyzing the correlation between the market benchmark rate and the interest rate of major financial products. We choose the 10-year treasury bond yield (Bond10y) and 10-year AAA level corporate debt yield (Debt10y) for the analysis. The sample period is from March 2006 to December 2014. Similar to the transmission analysis of dual-track interest rates, we use Ganger causality analysis under the VAR framework.

ADF stationary test shows that the 10-year treasury bond yield and corporate debt yield are both I (1) sequences, and the SC principles confirm that the lag order of VAR is 2, with the characteristic root of VAR falling within the unit circle. After establishing the VAR system, we conduct a Granger causality test on the variables, and the result is as follows:

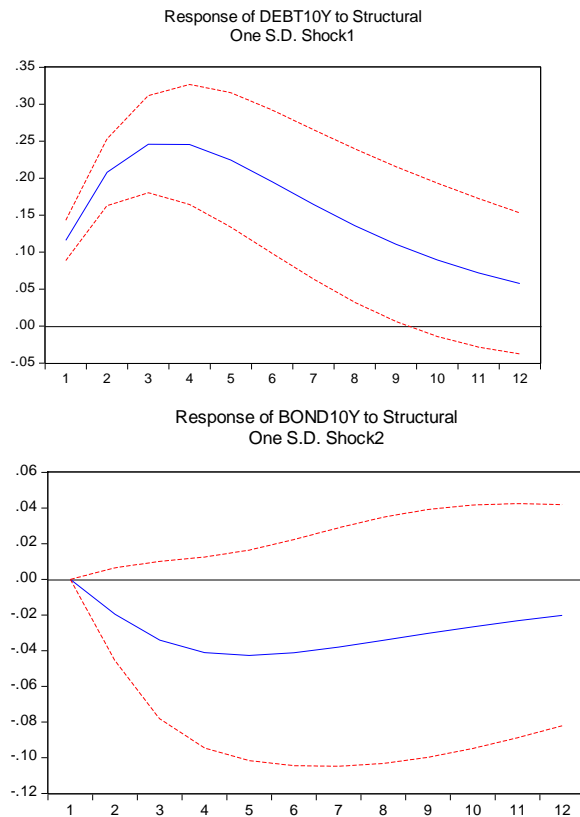
Table 2-6 Granger causality test on Bond 10y and Debt 10y

VAR Granger Causality/Block Exogeneity Wald Tests							
Dependent variable: Bond10y				Dependent variable: Debt10y			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
Debt10y	2.489425	2	0.2880	Bond10y	19.78855	2	0.0001
All	2.489425	2	0.2880	All	19.78855	2	0.0001

It can be noted that the 10-year treasury bond yield is always the Granger cause of

10-year corporate debt yield, but not vice versa, which indicates that the movement of treasury interest rates would significantly influence the movement of corporate bond rates, and that the treasury rate is working as the medium- and long-term benchmark rates in the financial market. Similarly, we construct a VAR model for the treasury interest rate and the corporate bond rate, and find that the corporate bond yield always responds positively to one unit structural shock of the treasury yield, and the maximum response appears after a three-month lag and then gradually converges after twenty months; on the contrary, the treasury yield responds weakly and negatively to one unit structural shock of the corporate debt yield, and the effect is around zero and gradually converges after 18 months, which further confirms the causality between the two.

Figure 2-8 Structural impulse function of Bond 10y and Debt 10y



IV. A Summary of the Characteristics of China's Interest Rate System

According to the guidelines of gradual reform, the liberalization of the price of financial factors should start from markets with the least impact on resource allocation, based on the principle of minimum risk. In this case, China's reform first started in the foreign exchange market. In terms of RMB interest rate liberalization, "interest rate regulation and the introduction of interest rate liberalization at the margin made the reform a Pareto improvement, which means it could improve allocation efficiency of financial resources in the banking sector without compromising the interests of the real economy" (Yi, 2009). Therefore, during the process of interest rate liberalization, China's interest rate system shows features of a dual-track system: The co-existence of controlled interest rates in the banking system and market-based interest rates outside the banking system. One characteristic of China's dual-track interest rate system is that liberalization is ever expanding while regulation is steadily narrowing its scope.

In terms of interest rate transmission, controlled interest rates and market-based interest rates can influence each other. Past empirical analysis shows that controlled interest rates have a significant impact on market-based interest rates, while the latter only has a weak effect on the former. With the progress of liberalization, market-based interest rates would have an even bigger impact on banks' deposit and loan rates.

With the advancement of financial reform and development, China has currently established an interest rate system with three levels: Central bank interest rates, financial market interest rates, and banks' deposit and loan interest rates. Specifically,

central bank interest rates refer to those of monetary policy tools, including open market operation interest rate, rate on required reserve, rate on excess reserve, refinancing interest rate, rediscount rate, and the rate of innovative liquidity management tools (such as the SLF, MLF and PSL). Financial market interest rates refer to the rates of various financial products in the financial market, including money market interest rates and the medium and long-term interest rates, and money market interest rates include interbank offered rates, interbank bond repo rates, short-term bill market rates, and short-term financing bill rates; the medium and long-term interest rates include bond yield curve and medium-term bill rates. Generally speaking, China has a relatively complete interest rate system with a complicated structure. For example, China's central bank interest rate system is very diversified and complex, and Chinese banks' deposit and loan rates include benchmark rates, loan prime rates and deposit and loan rates. As China deepens its market-based reform, the interest rate system will take on a clear structure.

In the meantime, the central bank should pave the way for reform and establish a market-based interest rate formation mechanism. On the one hand, the central bank should strengthen the pricing mechanism of financial institutions; on the other hand, it should promote the benchmark interest rate system in the financial market. Currently, the pricing mechanisms of commercial banks include internal fund transfer pricing (FTP) and risk pricing mechanism. With the deepening of interest rate liberalization, domestic banks could strengthen interest rate pricing management, develop interest rate pricing models, set up pricing support systems and improve pricing management mechanisms.

In terms of benchmark interest rate system, China has established a system of

short-term benchmark interest rates (represented by Shibor) and a system of medium and long-term benchmark interest rates (represented by the treasury bond yield curve). After the deregulation of loan rates, China has established a centralized quotation and publishing mechanism on loan prime rates. So far, the LPR system has been operating steadily and its application in the pricing of credit products and derivatives is expanding. Empirical results show that the movement of market interest rates is consistent with that of benchmark interest rates, and that the spread structure fully reflects the risk structure. However, Shibor's status as the benchmark interest rate has yet to be consolidated, and China has to further improve its financial market to draw up a complete and reasonable yield curve.

On the whole, before the ceiling of deposit rates was removed, China's interest rate level as well as its risk structure and term structure had already been determined largely by market supply and demand. However, interest rates in China are not completely determined by the market, as regulation still prevails and the financial market is underdeveloped. The risk structure and term structure are not as appropriate as expected, and the transmission mechanism is not strong. In this regard, China should aim to enhance the role of the market in interest rate formation and improve the transmission mechanism in the interest rate system.