DRAFT PAPER

China's shadow banking system and its lurking credit crunch: causes and policy options

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1.1 Introduction

In June 2013 the Chinese government and thereby the People's Bank of China (PBC) shocked the world markets by refusing to lend out money any further to Chinese banks, therefore causing turmoil on the Chinese interbank market. This so-called Shanghai interbank offered rate (Shibor) crisis made it clear that the PBC was not willing to provide unlimited liquidity. However, the Chinese government keeps investing in order to hold the GDP growth at a minimum level of 7% and as a result the government debt has grown above its head to more than 250% of GDP. After the credit crisis in 2007/08, the aggressive stimulus measures to boost economic activity required the authorities to relax controls on local government spending programs and since then China's credit and debt ratio expand much faster than its GDP growth. Currently China seems to be in a similar predicament to several of the developed economies prior to 2008 since too much credit has been created too quickly and too much money has been poured into investments that are unlikely to generate sufficient cash flows to pay off the debt. Although China is heavily indebted country, it is also argued that the rapid credit growth in China is not worrying because the debt is funded by domestic savings rather than by foreign investments and the total non-financial credit, at roughly 200% of GDP, is relatively low by comparison with many other advanced economies. Until recently, however, the savers had no alternative to leaving their cash in China's major state-owned banks (SOBs) dominating the credit markets and capital controls prevented them from taking money out of the country. Since the savers make little return on their bank deposits, often negative in real terms, they are looking for riskier alternatives outside the traditional banking system. As a result, the authorities are concerned about the rise of the shadow banking system[2] which has grown rapidly over the past few years and comprises entities and activities outside the regular banking sector. The SOBs function as an arm of the State Council, mainly focuses on lending to big state-owned enterprises (SOEs) and local governments rather than the small and medium-sized enterprises (SMEs) that employ around 80% of Chinese workforce. China's shadow banking fills this market gap by lending out money to both local government platforms and private firms. This involves informal securitization that occurs off-balance sheet through a funding pool provided by banks whereby non-bank financial institutions lend to mainly SMEs. Savings are migrating from bank deposits to higher-yielding non-bank credit instruments and the SOBs act as important distribution channels for financial products designed by microfinance, financial leasing, loan guarantee and trust companies. A large lending market outside the formal banking system has emerged, complete with underground finance, off-balance-sheet lending, and wealth management products (WMPs) that pool investors' money and invest it in various projects. WMPs are higher yielding deposit or investment products, with a variety of seductive monikers, which do not specify where funds are used. This situation creates risks and affects the dynamics of China's regular banking sector dominated by government regulation. The uncontrolled and loosely regulated shadow banking will give it a competitive edge.

There is currently a considerable debate among Chinese stakeholders about the merits and demerits of shadow banking. Proponents of more shadow banking stress the increasing economic efficiency through disintermediation, i.e. providing financing outside of traditional banking channels, and diversification of the provision of financial products and services. The emergence of shadow banks is an inevitable result of financial development and innovation. As a complement to the traditional banking system, shadow banks play an active role in serving the real economy and enriching investment channels for ordinary citizens. The shift from indirect to more direct finance will improve efficiency of fund use and well-conceived and balanced financial reforms have maximized the benefits of shadow banking while controlling the risks involved. However, some critics argue that shadow banking is not properly regulated and its scale and rapid growth does raise debt levels and make

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[2] Standard & Poor's defines shadow banking as credit intermediation involving entities and activities outside the regular banking system including the central bank, policy banks, commercial banks, credit cooperatives, and licensed financial companies with the functions of liquidity and credit transformation, which could potentially cause systemic risks or regulatory arbitrage (Standard & Poor's, 2013). It refers to both the business of non-traditional financial institutions and the engagement of SOBs in innovative financial products. It is debatable whether shadow banking really could be qualified as a "sector" or "industry", but in this paper it will be used as a sector for convenience.

credit flows less transparent and more risky. The main risks resulting from shadow banking are liquidity risk due to maturity mismatch and default risk from loans to weaker companies or projects. There are a few tools available to quantify or identify these risks clearly. The problem issue is not the size but more rapid growth and increasing complexity of shadow banking. Profit opportunities for players in the shadow banking activities come from financial repression which distorts the cost of capital and investment returns, regulatory restrictions on lending, and high demand for loans from many private and SMEs. The shadow banking system could be considered as a risk to the financial soundness and stability of the financial system and investors are worried that defaults in the banking system could trigger a financial crisis. However, these concerns are tempered by the authorities' vast financial resources and ability to exercise central control. Though there have been many defaults of smaller trust products in China over the past two years, market perception of risk has been heightened since the PBC restricted funding to the interbank lending market in 2013.

Shadow banking presents a difficult challenge. There is debate about whether shadow banking by its nature creates risk through regulatory arbitrage, or whether it represents much-needed financial innovation in the context of a still-developing but inflexible formal financial system. The authorities are not looking to do away with shadow banking. Instead their approach is to contain the risks, while engaging in reforms to reduce those risks and make the financial system more efficient and resilient. Much depends on the outcome of these reforms, although shadow banking innovation is very likely to stay one step ahead of the regulators. The policy makers want to encourage the development of non-bank financial institutions, which often lend to SMEs that are overlooked by the SOBs. In addition, many important borrowers, especially local governments, are heavily indebted and owe much of their financing to non-bank sources. However, the rise of shadow banking has been a major reason that China's debt has increased at a pace similar to its Western peers prior to the credit crisis. In contrast to the US shadow banking system, the Chinese system is still rather immature with its inherent high risk and lack of comprehensive regulations. Since 2010, several restrictive monetary policy measures have been imposed by the China Banking Regulatory Commission (CBRC) including the raising of the required reserve ratio (RRR), credit rationing and interest rate controls. As a consequence, different kinds of off-balance sheet financing activities in banks have been indirectly encouraged. Furthermore, the Chinese middle-class is increasingly willing to evade capital controls and take their money out of the country and declining capital inflows constrain the Chinese banks' capacity to lend. As a result of these developments, deposits in the banking system are becoming less stable. Although the PBC has made efforts to tighten credit and rein shadow banking, the consequences for a lurking credit crunch has only just begun. Currently the SOBs financial performance is rather successful, but there is a threat that a wave of non-performing loans (NPLs) will soon hit them. Since China's reservoir of cheap labour is running out, the authorities rebalance the economy from export- to consumption-led growth since they are less willing than in the past to pour credit into SOEs at the expense of households and private firms. They also have developed a new set of guidelines in 2014 which aim to regulate risky off-balance-sheet lending in order to curb the shadow banking risks.

This essay paper will analyze some worrying recent developments in China's unstable financial system due to more financial liberalization which has accompanied the growth of the shadow banking system predominantly represented by WMPs and trust products (TPs). Trust companies sell risky high-yield investment products to consumers which regular banks cannot undertake due to regulations. Since many of them are highly leveraged they pose a systemic risk to China's economy. In addition, other vulnerabilities of China's financial sector will be dealt with including the excessive credit growth combined with a real estate boom, the widespread belief that the authorities have underwritten all bank's risks causing moral hazard problems, related-party lending to local government infrastructure projects, loan forbearance, the need for rising asset prices to validate WMPs and TPs, an increase in bank off-balance-sheet exposures, duration mismatches and roll-over risk, contagion risk and widespread financial fraud and corruption. Shadow banks are filling these gaps accompanied by heightened financial risk and market volatility. Since the Chinese government is well aware of the increasing role of shadow banking, they are actively taking steps to regulate it and address related risk defaults. Since mid-2013 the deleveraging of shadow banking has begun through tighter regulation. This paper will explain the possible reasons for the increase in credit dependency of the Chinese economy and illustrate what the Chinese authorities could do to decrease the reliance on credit to further decrease the likelihood of a possible credit crunch in the future. The following research questions will be addressed:

- How China's shadow banking has contributed to the increasing reliance on credit?
- How Chinese authorities encourage shadow banking by reducing the risks via financial reforms and making the financial system more efficient and resilient?
- Which policy steps should be introduced in order to stem the increasing dependence on credit and to further prevent a possible credit crunch in the future?
- Will shadow banking destabilize China's financial system and cause a new financial crisis?

The aim of this conceptual and descriptive paper is to give an analytical overview of China's shadow banking system from a macro-economic perspective. This paper is structured as follows. Sections 1.2 illustrates China's debt concerns which are complicated by the rise in borrowing by local governments and the increasing role of shadow banking. The meaning of the phenomenon of shadow banking is described in section 1.3 through a comparison between China and its Western peers. The subsequent sections explain the main causes behind the rapid expansion of China's shadow banking (1.4), its size and scope (1.5) and its reasons for and against a potential crisis in the making (1.6). The key risk indicators to identify a financial crisis and some preventive and remedial policy measures to tackle shadow banking risks are addressed in sections 1.7 and 1.8 respectively. Finally the paper highlights some concluding remarks and recommendations (1.9).

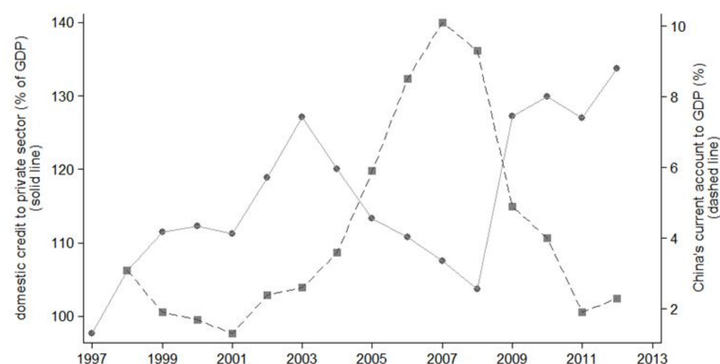
1.2 China's debt concerns

Although China's economic growth over the last decades has been spectacular, this growth has become increasingly dependent on debt creation. The increasing reliance on debt for growth is partly a consequence of China's relatively low domestic consumption ratio which the State Council wants to rebalance as part of the last Five Year plan 2011-2015[3].The excess savings of China's households, private and public sectors are channeled into the SOBs which lend it to finance domestic investments. The central government debt has increased from 147% of GDP in 2008 to more than 250% of GDP in 2014, so especially the fast increase of this debt in such a short time is worrisome since in other economies this often led to a financial collapse. The question is to what extent China's private debt-to-GDP ratio can continue to rise taking into account that more investments are made in non-productive projects and more debt is being used to repay old debts.
Since 2003, China no longer had to boost domestic demand through the creation of more domestic credit. Foreign investors were willing to borrow hundreds of billions of dollars every year to purchase Chinese products. The result was a rapid and dramatic increase in China's current account surplus from about 2.5% of GDP in 2003 to over 10% of GDP in 2007. In other words, instead of creating *domestic* debt to boost demand for its goods, China could rely on foreign investors to generate demand for its goods. This resulted in a reduced pressure on domestic debt creation, and domestic debt went down from 125% of GDP in 2003 to almost 100% of GDP in 2008. The continued borrowing by developed economies was not sustainable and since the start of the credit crisis which precipitated a sharp fall in export demand from developed countries, the global demand for Chinese goods collapsed. The Chinese government has responded to this drop in demand by stimulating a structural shift from export-led to more investment-driven growth, most of which has been debt financed. Figure 1 shows that the current account surplus declined from over 10% of GDP in 2007 to about 2% in 2011 which put severe downward pressure on China's growth rate. In order to create new demand for its productive capacity the Chinese government stimulated a rapid rise in domestic private debt through extensive credit creation by the SOBs. Since 2008, China has seen an explosive growth in domestic private debt partly due to the rise of shadow banking (Mian et al, 2014).

In the current situation there is still a key role for the government in the allocation of investments. Lending and deposit interest rates remain regulated and lending quotas are set by the government via strict loan/deposit ratio requirements. This system is widely perceived to have channeled huge capital flows to large and inefficient SOEs in key industries such as energy, transportation and infrastructure, many of which are facing significant overcapacity while causing difficulties for SMEs. It has become more apparent that this high level of lending to SOEs is beginning to deliver diminishing returns. Figure 2 shows that since the start of the credit crisis until early 2012 and once again between 2012-2014 the gap between credit expansion (total social financing) and nominal GDP growth has widened significantly which has caused excessive debt growth over the past decade (Manulife, 2014).

[3] The rebalancing of China's economy includes not only lowering investment and increasing overall consumption but also scaling down the role of the state sector, reducing speculative investment in real estate, altering the way credit is allocated, and speeding growth of the services sector. An effective rebalancing of China's economy is aiming a more sustainable long-term growth with lower short-term growth as a result.

Figure 1: The relation between China’s domestic credit to private sector (% of GDP) and its current account (% of GDP)



Source: Mian, A. and A.Sufi, 2014 (data source: Worldbank).

Figure 2: China’s total credit and nominal GDP, y/y%

Source: CEIC, Standard Chartered Research, July 2014.

While the developed economies were experiencing the adverse effects of the credit crisis, China was undergoing a period of monetary expansion, to the point that its credit-to-GDP expansion became an issue to worry about. Both the size of the local government liabilities and the private sector have contributed significantly to the leverage problem within the economy. When it comes to household debt, mortgage liability increases remained fairly in line with the income growth, therefore China is facing a different type of debt concentration from the situation in the US prior to the credit crisis where increasing household debt was the primary factor for expansion of the housing market. From 2008 the Chinese government has put a lot of pressure on expanding growth in order to reduce the adverse effects of the credit crisis, it boosted its spending with a 4 trillion RMB stimulus package of 2008/09. Although the private sector has always been heavily indebted, after the concerns of lower global demand, its debt ratio increased even further. The government focused its investment efforts on various key industries which turned out to be rather effective at first by restoring consumer confidence and improving the terms of trade. The effect of the stimulus package pushed up growth rates but also contributed to a troubled housing market. It remained a rather short term effect, because none of the investment initiatives bolstered the pace of equity increase to match the continuously increasing leverage rate. The principal underlying causes of this imbalance are the decrease in productivity gains and the overcapacity in the key industries. However, the strong growth of income and inflation resulted in sharp increases in property prices to the point that the government started to introduce restrictive policy measures in 2010. Figure 2 shows a fall of credit growth since the authorities have implemented monetary tightening policies in 2010/11 through rising interest rates and RRR. The government failed to notice the early signs of a cyclical downturn and rather allowed for easy monetary conditions within the financial sector through opposing monetary policy measures in 2011/12 which led to a rise of credit growth. The policy makers keep on fine-tuning their economy by sometimes tightening and sometimes loosening the reins (Linden 2012). At the same time the ‘financial dependency triangle’

between the state council, SOBs and SOEs still appears to be in part to exist by favoring SOEs more than private firms which are becoming more dominant in the financial sector (Linden, 2010).

1.3 The phenomenon of shadow banking: a comparison between China and its Western peers

The term shadow banking refers to banks that operate outside the formal banking system and is defined as the system of credit intermediation that involves entities and activities (fully or partly) outside of the regular banking system in a broad sense and as credit intermediation by non-banks in a more narrow sense. Although the specific content of shadow banking varies from country to country as financial systems differ accordingly, in Western economies shadow banking generally refers to an investment management scheme, such as asset-backed commercial paper and structured investment vehicles, that employs excessive leverage to maintain margins by raising short-term funds and investing them in long-term assets (mostly in tax havens). In the USA shadow banking evolved from formerly government sponsored securitization transactions that were utilized in order to enhance credit creation capacities for home mortgages. In parts of the EU shadow banking represents an evolutionary step from well established covered bond markets used to refinance highly rated credit assets of regular banks for centuries. By contrast, China's shadow banking is an inevitable result of financial innovation and has played an active role in broadening the investment channels for the Chinese private sector, while its Western peers have grown with the emergence of asset securitization technologies. Compared to the US, the Chinese shadow banking industry carries less complex financial instruments. Most of the financial products are either bonds or belong to the first layer of loan securitization. For example, loan trusts could be viewed as so-called privately issued bonds therefore allowing banks to sell or package the loans into WMPs. By contrast, the US has a well-developed shadow banking and capital market which includes a wide range of products that are far more complex in structure than those in China. The interconnection between the Chinese shadow and commercial banking sector is far greater if compared to the US, which operates mainly outside the boundaries of its financial market. Therefore, potential defaults are much less to worry about than in the Chinese system where defaults have a greater effect on the domestic financial market. The Chinese shadow banking is similar to the West in the sense that it serves the function of maturity transformation and has become a tool to avoid regulations and liquidity crises due to massive withdrawal of funds as the shadow banking system is not supported by the deposit insurance system or the discount window of the central bank. Another significant parallel between both shadow banking systems relates to the interdependency between shadow and regulated banks through the utilization of off-balance sheet investment vehicles (e.g. trust companies) to evade regulatory constraints and to increase income from lending activities. In both cases regulatory arbitrages incentivize regular banks to increase credit origination capacities through transferring credit risk to third parties. However, table 1 shows that China's shadow banking is also very different from its Western peers. The Chinese

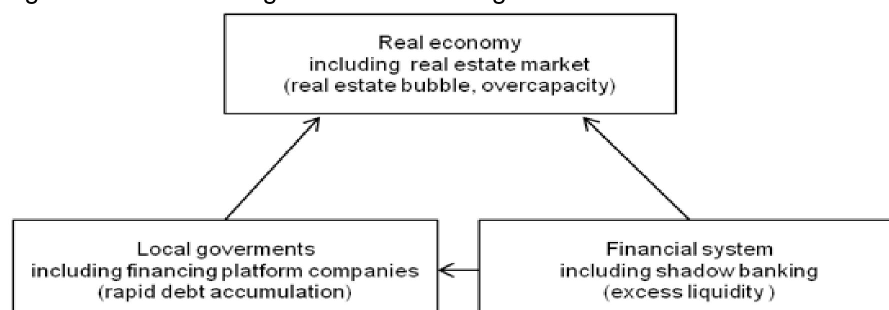
Table 1: A comparison between the Chinese and Western shadow banking system

China's shadow banking	*Western shadow banking*
Domestic financial system	Both domestic and foreign financial system
Mainly driven by commercial banks	Mainly driven by non-bank financial institutions
Underdeveloped secondary market	Well-developed secondary market
Low securitization rate	High securitization rate
Low leverage rate	High leverage rate
Purchases made by individual investors	Purchases made by institutional investors
Immature development phase with inherent risks	More mature development phase
Irregular fund raising and lending operations	More regular fund raising and lending operations

system is led by commercial banks through a relatively short and less sophisticated intermediation chain and has a relatively low securitization and leverage rate and purchases are mostly made by individual investors. A limited credit supply to private companies and projects as well as interest rate ceilings for bank depositors initially motivated banks to intermediate alternative sources of funds thereby tapping into the shadow banking system. China lacks a market for secondary transfers of credit assets which would allow efficient diversification of credit and liquidity risks. By contrast, the Western system is termed as market-based and is mainly led by non-banks where credit is being transferred and transformed along a chain of intermediaries. Partly due to a well-developed secondary market, Western shadow banking is characterized by a relatively high securitization and leverage rate and purchases are mostly made by institutional investors (Wiegelmann et al, 2013).

As a complement to the traditional banking system, shadow banks play a useful role in serving the real economy and enriching investment channels for ordinary citizens. Figure 3 shows that through shadow banking, funds are flowing into the real economy including the real estate market, either directly or indirectly through financing platforms of local governments, spurring an increase in housing prices. China’s shadow banking sector is part of the overall financial system which is characterized by excess liquidity and causes a rapid debt accumulation by the local governments, a ballooning of the housing bubble and an industrial overcapacity of the real economy. If this is allowed to continue, the financial system will be hard hit when the bubble bursts. Although shadow banking allows for alternative funding sources, but such loans may be more expensive to pay back, increasing the risk of default. This explains why the Chinese leadership considers shadow banking as one of the specific problems and challenges facing the Chinese economy alongside declining demand, overcapacity and local government debt, which has to be addressed through “reform, adjustment and innovation” to deliver continued growth (Summers, 2013).

Figure 3: The meaning of shadow banking in a macro-economic context



Note: Arrows show the flow of funds. *Source*: RIETI, 2013.

The main features of China’s shadow banking are the following. First, it has a complicated structure and almost no transparency, with improper disclosed risk. The financial products that are offered to investors are often advertised as stable and guarantee high annual returns, but when further information is requested about the structure of these products little is known by the banks that issue the products nor even sometimes by the designer of the product. Shadow lenders often don't disclose much about what they are investing in or how their loans are performing. It’s not unusual that high-risk securities are packaged into securitized products and then sold to investors as low-risk with guaranteed returns. The underlying investments for the WMPs are mostly difficult to retrace back resulting for more risk than actually was stated when sold, this phenomenon looks similar to the practices done by investment banks in the US prior to the credit crisis. Second, the sensitivity to the interest rate and inflation movements. The rise of inflation is a particular concern for the shadow banks, as this might convince the Chinese government to raise interest rates and therefore negatively influence the cash inflow for its fixed income and WMPs, if the shadow banks would go bust it’s quite possible that they would receive a bailout because of their exposure to the Chinese economy. Third, the lack of proper regulation and internal risk management. This inconsistency might raise the question on who should pay the bill whenever the current financial system goes bust. Regulation is not well defined and many people are unaware of the type of loans they get themselves into, allowing for information asymmetries to exist. Fourth, China’s shadow banking is highly dependent on capital inflow (Lingling Wei et al, 2014).

1.4 The rationale behind the rapid expansion of China’s shadow banking

The main causes behind the increasing shadow banking and regulatory arbitrage in China can be traced back through the restrictive regulatory policy measures in the traditional banking system combined with a strong demand for credit from the private sector, which unlike the Chinese households do not have a relatively high savings ratio. On the deposit side, by keeping interest rates artificially low, the authorities push savers to seek higher returns outside the traditional banking system. This results in demand for WMPs paying rates above the standard deposit rates which has been further stimulated since measures were introduced gradually from 2010 to dampen the property market, thus reducing investors’ interest or ability to invest in real estate. At the same time, low lending rates create a regulatory need to restrict borrowing to reduce inflationary pressures or surges of credit into the economy. This is one of the reasons why investment levels have remained so high in China

over the last decade and as result there are many companies which wish to borrow, but cannot get access to traditional bank loans. This is more so at times when the PBC is reducing credit growth by imposing tighter loan quotas for new loans of the regular banks (Summers, 2013).

From the viewpoint of procuring funds, the real economy started to face a shortage of funds in mid-2010 as the authorities shifted their policy from expansion to contraction in 2010/11. Shadow banking became increasingly important as a source of additional funding to the real estate industry, the local government platforms and the SMEs. Since the Chinese banking law limits bank-loan profits to percentages of the loan, small and medium-sized loans become much less attractive than large loans. Furthermore, the regular banking sector has strict loan underwriting standards, and SMEs often cannot provide sufficient collateral to satisfy these standards. Therefore, Chinese banks are not extending as much credit to SMEs, focusing instead on lending to large Chinese companies and also investing abroad. In fact, SMEs are more or less forced to look outside the traditional banking system to alternative financing sources (Schwarcz, 2013).

From the viewpoint of investors, shadow banking provides new investment products other than bank deposits, equities, real estate and foreign exchange as a way to diversify their risks and hence increase their income. These new products, which provide a higher rate of return than the bank deposit rates, are attractive to investors. From the perspective of financial institutions that serve as the intermediaries for funds, shadow banking is a way to circumvent regulations through financial innovation. The PBC has established interest-rate regulations, relatively high RRRs (around 20%) and regulate bank lending through imposing a conservative loan-to-deposit ratio (around 70%). As market competition has intensified, banks have come to use shadow banking as a tool for expanding lending in lieu of traditional channels in order to avoid regulations (RIETI, 2013).

1.5 The size and scope of China’s shadow banking system

China’s shadow banking phenomenon should not be underestimated due to its fast growing trend of non-financial intermediaries. Non-formal financial institutions that engage in lending activities include small loan companies, pawn shops, credit guarantee companies, private equity funds, rural mutual financial organizations, and various private lending institutions. Also, some off-balance-sheet WMPs pool the cash together to achieve maturity transformation, while some trust schemes roll-over the short-term funds into the medium and long-term projects. Finally, money market funds, by purchasing bank debentures and investment bank deposits and participating in repurchase transactions in the financial market, help increase lending by banks and other institutions. They also provide companies with debt capital by purchasing enterprise bonds and short-term commercial papers (RIETI, 2013). China's non-bank lending has surged in recent years as part of Total Social Financing (TSF) and hence the total credit to GDP ratio (see figure 2 and 4). It is estimated that the shadow banking sector comprises more than 68% of GDP or 23% of total bank assets by the end of 2013. The available data is largely confined to the TSF which shows gross new lending and comprises besides traditional bank loans six other components including entrusted loans with a share of about 15% in TSF, trust loans (10%), corporate bonds (10%), foreign currency loans and equity financing (together 9%) and bank’s acceptance bills (4.5%). The share of traditional bank loans is 51.5%, which shows that only about the half of incremental total credit originated in regular banking activities last year (Jacob, T. et al, 2014). The problem with China’s shadow banking is that a lot of its fund raising and lending operations are irregular when compared to Western practices. This will make it difficult to determine the size of shadow banking, which also depends on whether you use a narrow or broad definition of shadow banking. It matters if only WMPs and TPs are considered as is done by Zhang Ming (2013) or entrusted loans and private lending are also included as is done by Standard & Poor's (RIETI, 2013).

The specific scope of China’s shadow banking products is not clear yet, but a variety of both on- and off-balance sheet transactions can be classified as shadow banking. On-balance sheet products include corporate bonds, bankers acceptances, equity financing, and asset-backed securities, while off-balance sheet products can be found, ranging from undiscounted acceptance bills, asset backed bonds, collective TPs and entrusted loans to bank’s WMPs and local government financing vehicles (LGFVs). As local governments are prohibited to take on credit on their own account, they set up platform companies, commonly referred to as LGFVs, to finance their investment activities in the form of bank credit. The WMPs and TPs, sold by banks and trust companies respectively, comprise the core of shadow banking products. Banks and trust companies, most of which are state-owned, are

under the jurisdiction of the PBC and the CBRC, so the sales of WMPs and TPs are also subjected to their supervision.

Figure 4: Total Social Financing as % of GDP divided into bank and non-bank lending

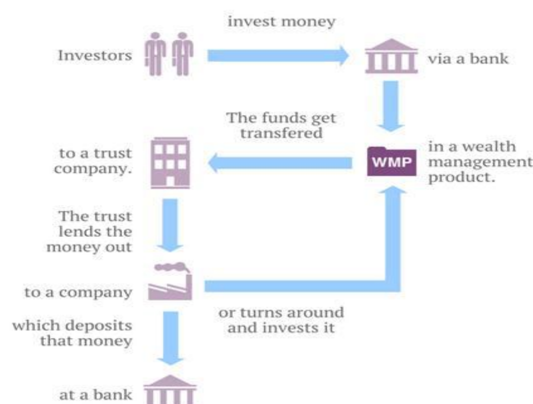
Total Social Financing as at November 30, 2013.
Source: People's Bank of China, World Bank, KKR Global Macro & Asset Allocation calculation.

From a historical institutional perspective, shadow banking started after 2004, when there was an expansion of trust company operations. Trust companies were not new since they owed their origins to the establishment of the China International Trust and Investment Corporation (CITIC) in 1979, and the subsequent formation of regional ITICs through the 1990s. The growth of these companies began to complicate the banking environment, as they were able to serve groups of customers who were not serviced by the traditional banks including SMEs who could not borrow from the banks. The banks were not able or willing to lend because of the quality of loans and regulatory restrictions designed to ensure that banks retained sufficient capital to guard against risks. Regulatory responsibility for trust companies was handed from the central bank to the CBRC in 2003, and regulation has since tightened. Basically, trust loans are corporate credit products structured by trust companies with a maturity at around 2-3 years with recently a shorter maturity and thus a higher roll-over pressure. The investment destination mainly includes infrastructure (about 25%), real estate (10%) and industrial enterprises (28%). These were typically the sectors for which the government wished to cut down credit by the traditional banking and implies risks for banks' balance sheet if the WMPs decline in performance due to a decline in property prices (RIETI, 2013).

The reverse side of TPs are WMPs. Since WMPs are issued and sold by commercial banks, they represent the expansion of their traditional deposit businesses, and the provision of new investment products in line with practice in other markets. WMPs are more an example of financial innovation rather than regulatory arbitrage. This distinction reflects the debate as to whether the shadow banking sector should be seen as inherently risky regulatory arbitrage or an innovative stimulus to financial reforms which also serve real needs of both investors and businesses (Summers, 2013). WMPs are typically short-term with an average maturity of four months and are sold mostly via banks and offer investors a return of around 2% above bank deposits. Most banks' WMPs are not stated on their balance sheets, as banks do not assume the risk on their own, given that the contract documents do not guarantee the principal or interest rates. WMPs are mostly fixed income-type products invested in a variety of assets that banks market to customers as higher-yielding alternatives to traditional deposits. In principle, banks simply manage WMP assets on the account of the client instead of the bank, so they are exposed to losses if the assets decline in value. As a result, Chinese banks are increasingly exposed to off-balance-sheet assets underlying WMPs. One reason WMPs offer higher rates is that they are based on riskier bank loans and this makes them shadowy because the banks hold these loans off-balance sheet and do not set aside capital against their potential defaults. Instead, they typically extend them via trust companies that are not allowed to accept deposits or

create money, but are allowed to manage it. The trust companies create investment products like WMPs, which banks market for them in return for a commission. The trust company then invests the money gathered through a WMP in a given company (see the lending cycle of a WMP is presented in figure 5). Legally, banks will not be liable if a TP defaults, but as banks sell these products they may nevertheless bail them out to maintain good customer relations (Jacob, T. et al, 2014).

Figure 5: The lending cycle of a wealth management product



Source: Guilford, G. (2014)

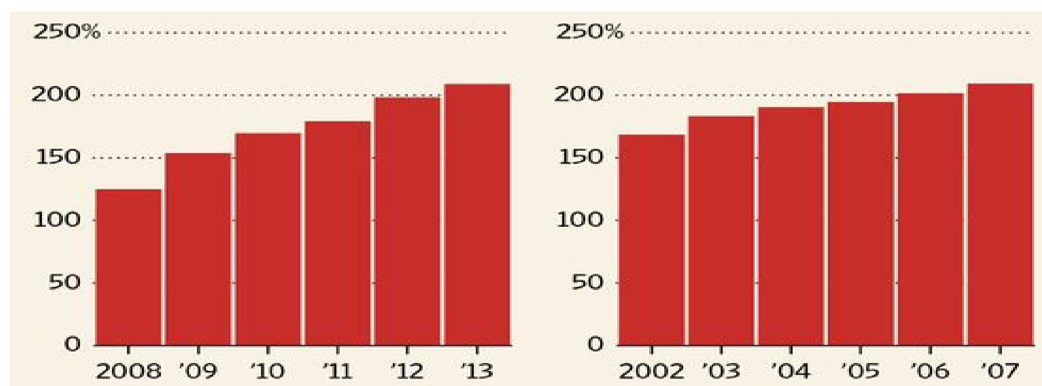
Since more and more trust companies lend out money to infrastructural and real estate projects with an overcapacity, this creates a great concern that these investments are unlikely to generate returns in the short term. WMPs have been the major source of funding and as WMPs are rolled over at short-term intervals, more and more new issuances are needed to pay off the expiring ones. A vicious cycle has developed, sparking growth in shadow banking activities and rendering these types of investments highly vulnerable to a sudden shortage of funds (Thomson Reuters, 2014). It is unclear whether investors in these WMPs and TPs are fully aware of the underlying risks. The trust companies and third-party investors likely decided to bail out these products because they were concerned that significant losses to retail investors would lead to a widespread confidence crisis. It is possible that banks have already been involved in bailouts behind the scenes due to the need to protect their reputations. In any case, the time is fast approaching when banks will have to become overtly involved in a shadow banking default either by bailing out a product or, as is increasingly likely, by suffering losses. The potential severity of a true WMP or TP default should not be underestimated as the shadow banking system is actually deeply entwined with China’s wider interbank lending market. Most trust companies and SMEs are heavily reliant on the interbank market for funding, and often have limited reserves to bring to bear in the case that a default lands in their lap. The SOBs, on the other hand, are less at risk due to their more diversified financial foundations. Indeed, small financial institutions such as joint-stock, city and rural banks are among the largest sellers of WMPs, accounting for more than 40% of the market in 2013. The size of the shadow banking system remains manageable at this stage relative to the size of China’s banking system as a whole. However, the potential for a loss of investor confidence or a credit crunch in the event of a true default could pose a major threat to the country’s financial stability if its growth continues unabated and regulations are not revised (Manulife, 2014).

1.6 Reasons for and against a potential crisis in the making

There are concerns that China is on the verge of a “Lehman moment” due to the emergence of systemic risk as a result of the rising shadow banking. Although different from the subprime mortgage crisis that occurred in the US, there are also some similar patterns to be observed in terms of a rising debt burden. Figure 6 shows that China’s credit-to-GDP ratio has been rising quickly between 2008-2013, much like the US’s credit-to-GDP ratio did prior to the credit crisis. Significant concerns have been raised about the interconnected relationship between regular and shadow banking activities. A particular fear is that risk exposure might be heightened owing to a lack of transparency on these types of investments. The less regulated and more complicated shadow banking system could create system-wide, regional financial instability or potentially even a new global financial crisis if the current situation is not closely monitored (Thomson Reuters, 2014).

Shadow banking tends to amplify financial risks inherent in the financial intermediation more than it creates new risks. Some of the key risks involved in China's shadow banking sector are the following: Firstly, liquidity risk. This mainly arises from maturity mismatch and the quality of the management. There is more liquidity risk compared to the regular banking sector, as it is more difficult to fully assess the quality of the underlying assets related to the financial product. Secondly, credit default risk. This results from the tendency of many loans to customers who cannot get loans from the regular banks, and therefore may be involved in industries suffering from overcapacity or projects with poor returns. When this is compounded with the higher rates of interest that borrowers are paying, there is a clear risk of default. Given that almost all shadow banking loans are made against collateral, in theory the risk should be with the debtor. However, weak credit standards compared to SOB loans will result in lower transparency due to the lack of proper monitoring and regulation. Thirdly, private sector debt. Insufficient regulation of shadow banking institutions and poor risk management by the institutions

Figure 6: China's credit-to-GDP ratio between 2008/13 and US's credit-to-GDP ratio between 2002/07



Source: Wall Street Journal based on the data from Fitch, PBOC and IMF International Financial Statistics

themselves raises the corporate indebtedness and growing dependence on leverage both by the private firms and shadow banking institutions. Fourthly, contagion risk. This arises from the complex and non-transparent nature of shadow banking and from its interconnected nature (Summers, 2013). Fifthly, counter-cyclical policy risk. When the authorities introduce anti-cyclical policy measures (e.g. increasing RRR during an economic upturn) this could adversely affect the operations of shadow banking as the rise of corporate loans may be a reason for the government to intervene in such a way that it will increase the likelihood of default on loan payments. Sixth, the moral hazard issue. Financial institutions lend freely and irresponsibly to borrowers without proper due diligence. This situation is exacerbated in China by the expectation that the government will always step in to save the borrows from default. This moral hazard problem is accentuated by the so-called 'financial dependency triangle', i.e. the state's control of both the SOBs and the SOEs as the main recipients of credit (Linden, 2010). These arrangements have encouraged crony lending practices and the concealment of NPLs. In recent years, the problems of moral hazard, related-party lending, and loan forbearance have been particularly prevalent in the area of local government finance in the form of LGFVs.

The risks involved in shadow banking could increase unless they are put under proper supervisory control. First, the effectiveness of macro policies and financial supervision may decrease. Some financial institutions that have shadow banking functions continue to invest funds in the LGFVs, real estate and industries with high contagion risks, heavy resource consumption, and excess investment, despite the government's intention to make structural adjustments. In addition, they could induce a moral hazard and adverse selection by hiding the problem of bad loans by making up for any losses. Second, because the sources of income and operations of shadow banking business are inseparable with those of regular banks, the risks could have repercussions on other industries and markets unless an effective separation wall is constructed. Third, shadow banking can adversely impact the management of regular financial institutions. To acquire customers, some shadow banking institutions promise a rate of return significantly higher than bank deposit rates which could result in funds flowing out of banks. Finally, informal financial institutions that carry shadow banking functions, such as certain small loan firms, pawn shops, and credit guarantee companies, are increasing their lending volume by ignoring rules and risks. Due to the lack of proper oversight from authorities, operating beyond the business lines has become widespread. With these risks in mind, the PBC is aiming at a

more reasonable determination of the scope and level of supervisory management to combat the problems and potential risks in the development of shadow banking by building a diversified, multi-layered financial system that focuses on developing statistics to determine actual conditions, sharing and disclosing information to improve transparency and promoting continued financial reforms.
In the near future it will become important to strengthen the supervision of shadow banking and increase the cooperation among supervisory authorities. Therefore, it will be necessary to clearly separate the operations of regular and shadow banking to segregate their risks and impose appropriate capital and liquidity requirements on their activities (RIETI, 2013).

Besides several reasons for a crisis in the making, there are also many counter-arguments to put this into another perspective and not necessarily worry about a new financial crisis. Since most Chinese banks are state-owned, the government as a lender of last resort will likely step in to provide support in times of trouble and has sufficient means to manage a bailout. Also the authorities have already taken actions such as tightening regulations to curb the expansion of shadow banking which could help to avoid a financial crisis. Although China's shadow banking is increasing, the size is still rather small compared to the existing bank lending and shadow banking in major developed economies is much greater in scale than in China. Also, the deleveraging of the shadow banking sector has just begun and its massive expansion has slowed recently. As the leverage ratio is relatively low, market turmoil due to deleveraging also will likely be avoided. As WMPs are typically short-term, there is a maturity mismatch with funding gaps often financed by interbank liquidity. However, in June 2013 funding pressures let overnight liquidity prices to quadruple, rendering the WMP business much less profitably. Moreover, the 3-month Shibor never came substantially off its peak, ranging slightly below 5.0% compared to 3.9% before. Assuming that WMPs are close substitutes, funding costs for banks have substantially risen (Jacob, T. et al, 2014). Furthermore, since capital flows in China are still controlled, the RMB is less prone to become a target of speculation. Exchange controls may prevent Chinese investors to leave their money out of the country. Finally, a run on shadow banks is unlikely since China has the capacity to absorb lots of NPLs and its debt-to-GDP ratio is much smaller than most its Western peers before the crisis struck. More important, China's central government and the big SOBs are still in financial health and could intervene to buy up troubled assets, preventing the credit market from seizing up (The Economist, 2014b, p.13). All these factors together have led to a reversal of shadow banking and it is unlikely to lead to a systemic crisis.

1.7 The key risk indicators to identify a financial crisis

The refinancing risk within the banking industry, as well as the liquidity risk in the Chinese housing market have heightened the default risk of borrowers and even the overall market risk in financial markets. It is essential that investors identify key risk indicators in order to better understand the drivers that could lead to a deterioration in stability. Five risk indicators have been identified to help investors to prepare for a potential crisis:

- house prices
- interest and inflation rates
- capital flows
- the repo rate
- required reserve ratio

First, the current Chinese housing market is supported mainly by new investments and domestic real estate speculation, where large sums of money for real estate developments are sourced from WMPs. Weakening housing prices would lower returns and increase the default risk of loan repayments. An even bigger problem is the growth of vacant apartments given Chinese constructors' foremost aim of attracting investment rather than contributing to residential demand (Linden, 2012). Second, currently China's deposit interest rate is still controlled by the PBC. Investing in shadow banking products can earn a high net interest margin between the controlled and the black market rates. This high margin attracts investors seeking high returns, further stimulating the rapid development of shadow banking. Although China's average inflation rate has been relatively low since 2010, any rebound would lead to a deterioration in the current situation, as China could increase the deposit rate to curb inflation. A higher interest rate would reduce the net interest margin, thereby reducing the amount of funds flowing into shadow banking products and increasing the risk of a fund shortage. Third, China still has imposed capital account control, i.e. control on both capital inflow and outflow. As foreign investors are

more uncertain about the growth potential of the Chinese economy, there are concerns about the decreasing inflow of foreign capital. Besides, China is moving towards the opening of its capital account and further financial reforms which might lead to the massive outflow of domestic capital to search for higher return, thus the combined effects could dry up the local liquidity. Fourth, during the Shibor crisis in June 2013, there was a peak in the Chinese bank repo rate revealing an inter-bank liquidity problem. A high repo rate increases banks’ financing costs on WMPs, thus increasing default risk. It also puts pressure on mortgage rates, resulting in reduced speculative investments in real estate, in turn driving housing prices down. Fifth, China’s RRR is about 20%, which is much higher than that in the US (about 10%) and Europe (1%). A high RRR reduces banks’ ability and willingness to lend to high risk companies like SMEs. These companies are therefore forced to obtain funding through off-balance-sheet activities. Although there are no signs of an RRR adjustment, the scenario of a higher RRR, which would tighten banks’ liquidity and trigger a higher repo rate, is one which investors should be aware of (Thomson Reuters, 2014).

1.8 Preventive and remedial policy measures to tackle shadow banking risks

The indecision about how to deal with shadow banking has been one reason why China's financial markets have faced several credit crunches lately. The PBC has pushed up borrowing costs in the interbank market as a way to curb the growth of shadow banking. Banks turn to the interbank markets for funds and lend the money to other institutions. Higher interest rates would raise the cost of capital for shadow banking and could make borrowers more cautious about taking on too much debt.
Since China’s interbank squeeze in June 2013 reached an all time high rate of 9.89%, several policy measures have been executed to fine tune the merits and demerits of shadow banking in order to prevent a sudden credit crunch. The Chinese policy makers understand that shadow banking is here to stay and they have become increasingly cautious and hope that a new set of guidelines will add oversight and regulation to the shadow banking and closely monitor unofficial lending programs, especially those involving WMPs and TPs. China’s current policy on shadow banking is an attempt to regulate, not to ban alternative sources of funding, while at the same time officially legitimizing it. The aim is that this will prevent parties from exploiting the regulatory loopholes in the current system and, as a consequence, lower the country’s growing debt levels. However, it could also potentially threaten reform policies by providing an easy way to circumvent loan restrictions that are designed to ease industrial overcapacity and rein in debt.

With the aim to reduce the shadow banking risks it is important to make a distinction between preventive and remedial policy measures to be taken. Preventive measures are necessary to protect the Chinese financial system from systemic risks. More focus on supervisory measures detecting credit risk in the system also means including the supervision of shadow banking entities as well as the implementation of transparency standards. Moreover, implicit guarantees should be transformed into explicit and correctly priced credit risk transfers. In order to allow all financial institutions to diversify their credit risks, a secondary market for credit assets and risks is essential to increase the strength of China’s financial system. In the long-run, China is likely to face significant pressure to loosen controls over credit markets due to steadily increasing financing needs. For example, private savings are unlikely to suffice Chinese credit demand in the future; hence liberalized credit creation steps in to compensate for this deficit. Besides attracting foreign investments in Chinese debt, the government already began to loosen restrictions on credit supply and interest rate controls. These measures are likely to increase diversity amongst Chinese banks reducing both the necessity to conduct shadowy credit intermediation and the likelihood of defaults due to similar risk-return profiles (Wiegelmann, 2013).
In addition, remedial measures have to be implemented with a match between the means used and the ultimate aim to reduce shadow banking risks. The following remedial measures could be used:

- a government sponsored bailout
- structural reforms with more emphasis on consumption led and quality growth
- reducing maturity mismatch and default risk of WMPs and enhancing its transparency
- interest rate liberalization
- reforming banking regulations
- provision of fund-raising platforms to SMEs
- stress testing on banks

A government sponsored bailout of the financial sector as in 2000 could be implemented, when the government decided to set up four asset management companies (AMCs) to transfer all NPLs to these companies with the aim to cover up their debt. This was made possible due to the fact that the government decided to inject public funds into these companies to be able to transfer the debt to the AMCs at a significantly lower cost. Another option would be to transfer funds of the central to the local governments in order to give them some support to repay debt, by selling and privatizing the assets of the local governments to raise capital for paying off debt. This in particular has been a recent trend in the Chinese market, and it is likely that this trend will continue due to recent pressure on credit. The advantage of a bailout is that it has the potential to reduce adverse effects of a credit crunch, however, the drawback of a bailout is that it will not stimulate the growth potential.

The government expenditures and investments should become more focused on the private firms rather than solely on SOEs, and the government should focus its efforts to shift the growth strategy more toward consumer expenditures on goods and services rather than solely being based on export, by at the same time allocate jobs more efficiently among people in order to counter so-called 'gray employment'. At the moment the country is growing on a growth strategy that is maturing and not sustainable to last in the future. In order to tackle this phenomenon, the government should devote itself in making structural reforms and also reexamine the meaning of growth by not looking solely on the quantity of GDP growth but more on the quality of the GDP growth (Lingling Wei et al, 2013).

Reducing maturity mismatch and default risk of WMPs and enhancing its transparency. The dubious creditworthiness of many WMP assets means that defaults are an ever present possibility. A more adequate quality of the underlying assets could minimize default risk. In addition, as WMPs are rolled-over at short-term intervals to fund long-term investments, maturity mismatch is the main underlying risk. By setting a limit on mismatch ratios or on liquidity requirements for companies using short-term WMPs, regulators could restrict the use of short-term WMPs to fund long-term investments. Moreover, most WMPs only give brief descriptions of their underlying investments without any further information. To enhance the transparency of WMPs, the government could provide guarantees and require issuers to clearly state where and how capital is invested, the inherent risks and the expected returns.

A reform of the interest rate liberalization will allow interest rates to return to the market level, reducing the net interest margin on shadow banking products. Product returns would then be constrained by inherent credit risks.

Reforming banking regulations. Since the CBRC imposed restrictions on bank lending activities in 2010, the growth rate of bank loans has greatly reduced. These regulations have helped banks to reduce the risk inherent in regular operations, but this risk has merely shifted into shadow banking activities, which are harder to control. Regulators should relax the restrictions for loans so as to shift risks back to the traditional regulated platforms, rendering this risk transparent to both investors and regulators. More direct measures to regulate off-balance sheet activities should also be implemented.
Provision of fund-raising platforms to SMEs. The limited access to fund-raising has forced SMEs in China to borrow through the shadow banking system. If the Chinese government wants to reduce this recourse to alternative sources of funding, more funding sources should be provided, particularly for SMEs. For example, the State Council could accelerate the creation of capital markets and introduce new investment tools by easing restrictions on SMEs' issuance of preferred stocks.
Stress tests on banks are commonly used worldwide to analyze whether a bank has sufficient capital to withstand the impact of unfavorable economic scenarios and adverse developments. However, even though China has applied such stress tests, they have rarely published the results in the public domain. Furthermore, stress tests conducted by local banks are not always standardized or aligned with international requirements and are only reviewed occasionally and unsystematically.
Standardized stress tests on banks' and financial institutions' systems are required, with all banks following the same scenarios and results disclosed to the public. Not only would this help both the government and banks to be prepared for any potential problems, but it would also raise general awareness about banking system health (Thomson Reuters, 2014).

1.9 Concluding Remarks and Recommendations

China's economic growth has become increasingly dependent on debt creation and the government recognizes that relatively slow growth combined with a heavy reliance on credit are unsustainable in the future and might lead to a credit crunch. The adverse effects of this development are noticeable throughout China in the form of 'ghost towns' and vacant apartments, while at the same time there is a considerable overcapacity in the production of building materials such as steel, cement and solar cells. Since the credit crisis 2007/08, a slowdown for Chinese goods from the advanced economies has pushed forward debt-financed investments causing an explosive growth in domestic private debt. At the same time, shadow banking activities as a new phenomenon in China, have expanded rapidly in recent years both in size and significance. China's shadow banking system has highlighted the risks arising from the opaqueness of its financial sector and the rapid growth represents a liberalization of its financial system. Slowly but surely China will reform its financial markets and the government will continue adopting targeted financial policies, regulations and financial infrastructure that will support and guide both the regular and shadow banking system.

Promoted by the financial innovations the rise of China's shadow banking is mainly caused by tight regulatory policy measures in the traditional banking sector and massive investments in real estate and infrastructure. Market competition has encouraged banks to seek loopholes in regulations by making loans and attracting deposits via WMPs and other unconventional channels. As long as SOBs are continuing to lend to big SOEs and local governments rather than SMEs, this will create a mismatch which will push forward shadow banking activities. Market concerns have been growing over the size and quality of various WMPs, which are off the balance sheets of banks. The increasing off-balance sheet activities of regulated banks are not as well regulated as regular bank lending, and trust companies and other non-bank institutions are not under the same kind of scrutiny as banks. The main question to be answered by policy makers in the near future is how risky are the underlying credits in shadow banking. Several areas of shadow banking could be risky including trust credits to property developers and the financing companies of local governments, and curb-market loans to distressed property developers or export-related SMEs. A common characteristic of these borrowers is that they have limited access to bank loans because of either weak credit profiles or unfavorable credit-rationing measures imposed by the government.

China's shadow banking system has been weakening monetary policy and has acted as a substitute for financing within the formal financial system. Due to the interconnectedness of regular and shadow banking activities and the lack of transparency of the less regulated shadow banking system, it could threaten a full-blown credit crunch if the current situation is not closely controlled. Any major fluctuation in China's shadow banking can send shock waves through the global financial markets that could affect the entire global financial sector. Basically, China's shadow banking system has grown too big to fail, but it may also have become too big to control. However, China is only in the early stages of the development of shadow banking and in contrast to the US, China is suffering more from leverage in the corporate sector. It is crucial to start the deleveraging of the corporate sector by providing more favorable credit conditions for private firms rather than SOEs. In the banking sector it should give stronger consideration to the shadow banking institutions in order to avoid systemic risks. If the authorities will gradually give the market a more decisive role, the government should empower investors to impose market discipline. It is obvious that the government should be more willing to define proper underwriting standards of credit and equip investors with more transparency and information that can help them to make wise investment decisions.

Although China's shadow banking phenomenon should not be underestimated, its strong expansion ended in mid 2013 mainly due to tighter regulation. Most of China's shadow banking is regulated, unlike those in developed markets, and its size is still small compared with the West and its regular banking system. Since the government has sufficient means to clean-up the shadow banking system there is not much reason to fear a system crisis and a downtrend of global markets. While China's overall debt may seem high, much of it has been used for investment, not consumption, and China has a very high saving rate. Banks may have more NPLs than shown officially, but even the true NPL ratio is nothing compared with a decade ago and Chinese banks have ample liquidity and a relatively low loan-to-deposit ratio. The still largely closed capital account, substantial current account surplus and large foreign exchange reserves should help to limit the damage banking problems can cause. However, to say that China's financial system is not about to collapse does not mean that there is little risk to concern investors or that policy makers should ignore some of the clearly unhealthy and

unsustainable developments. Besides the moral hazard, contagion and counter-cyclical policy risk, the liquidity and default risk are the biggest threats arising from the shadow banking expansion and if unchecked it could lead to systemic risk in the long term. On a macro-economic level, the rapid growth in shadow banking credit has led to a significant easing of overall credit conditions since mid 2012. While this has been helpful for growth recovery, policy makers who have focused on the traditional broad money and bank lending indicators may misjudge the true credit conditions in the economy. In such a case, policy adjustment may be delayed until massive leverage increase has led to overinvestment, inflation, and/or asset bubbles. By then, the government may have to tighten credit abruptly, causing more pain to the economy and leaving NPLs in the wake. It is therefore essential that the authorities are constantly monitoring and identify risk indicators such as house prices, interest and inflation rates, capital flows, repo rate and the RRR to help investors to prepare for a potential crisis. Another major risk is economic volatility related to unexpected liquidity tightening. Liquidity in the shadow banking sector is generally not very stable compared with deposit-funded regular bank lending, and depends heavily on market confidence. Payment issues in parts of the market such as WMPs and LGFV, could shake confidence and dry up liquidity suddenly. The most likely scenario is that banks either bring the underlying assets back to their balance sheets, or develop other products to take things over. However, this will take time and banks' balance sheets cannot expand quickly enough to completely compensate for the drop in shadow banking, especially as banks face credit quota and other regulatory constraints. Since mid 2013 this has led to liquidity and credit tightening including several policy measures to tackle shadow banking risks ranging from preventive means to supervise shadow banking entities as well as the implementation of transparency standards to remedial means to reduce the maturity mismatch and default risk of WMPs, providing fund-raising platforms to SMEs and even implementing stress testing on banks. The Chinese government could adopt measures to encourage the sound development of stock markets, trust funds and others funding sources other than SOBs. At the same time, they could consider changes in the taxation to allow a better financial situation for private firms and SMEs to make them less dependent on more risky funding from shadow banks. The Chinese leadership considers shadow banking as one of the specific problems and challenges facing the Chinese economy which has to be addressed through "reform, adjustment and innovation" to deliver continued growth. As has been observed before, the authorities will implement a mixture of policy measures including a relatively tight monetary policy, regulatory improvements as well as limiting credit for certain sectors in the economy. However, it will also involve rolling over existing debt while forcing banks to accelerate NPL disposals. Moreover, the government could open the market for new tools in form of local government bonds, securitization or even bad banks. In the end the financial reforms should gradually lead to a transition from lending to risky into more creditworthy sectors of the economy. This could allow China to orderly deleverage with a limited impact on growth. In the near future more defaults of trust products might occur, but it is unlikely to lead to a serious new credit crunch.

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