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Comparison of the Shadow Banking in the European Union and China

Student: Bc. Shiyao Xu
Supervisor of the diploma thesis: Ing. Josef Novotný, Ph.D

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Annexes

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VYSOKÁ ŠKOLA BÁŇSKÁ-TECHNICKÁ UNIVERZITA OSTRAVA
Ekonomická fakulta
1

Ing. Iveta Ratmanová, Ph.D.
Head of Department

prof. Dr. Ing. Zdeněk Zmeškal
Dean

“I hereby declare that I have elaborated the entire thesis including annexes myself.”

Ostrava dated 11.04.2018

Xu shiyao 许仕尧

Student name and surname

Contents:

1 Introduction

Nowadays, more and more investors choose to be involved into shadow banking business, which have helped the development of shadow banking system. Since the financial crisis in 2008, majority of investors were afraid to traditional banking system, they realized that they should minimum their risk of investments, one way of the reducing risk is that making their variety of investments more various, they do not trust any single financial institutions any more, as a result, it is risk distribution. Finally, the shadow banking became a new popular way to invest or finance in both China and European Union. However, due to the lack of supervision of shadow banking system, the shadow banking system cruel grew, which would interference the original stable financial system if we would ignore the potential risks of shadow banking system and we would not make a better regulation system to control it.

The goal of this thesis is the description and the analysis of potential risk and regulation of shadow banking system in China and European Union.

In chapter 2, we will introduce the theoretical background of shadow banking system in generally. In contrast, there will be some comparison banking system between shadow banking system and traditional banking system. Also, there will be summarized introduction of shadow banking system in specifically, which includes operations, risks of shadow banking system and so on.

In chapter 3, we will introduce some existing shadow banking system in both China and European Union, which will be more specific to help readers to know working of shadow banking system in China and European Union better. It mainly focuses on the developments, composition, characteristics, impacts and risks of shadow banking system in both selected countries.

In chapter 4, there will be the analysis of potential risk and regulation of shadow banking system in China and European Union, which would help readers to get in touch the existing situation of shadow banking business in selected areas nowadays.

2 Theoretical background of the shadow banking system

Shadowing banking system indicates that a group of non-banking financial intermediaries which can provide some financial services that are similar to traditional banks, but these shadow banks could escape from normal banking regulations. In order to specify the shadow banking system, we will introduce both traditional banking system and shadow banking system in this chapter.

2.1 Traditional banking system

Farlex Financial Dictionary (2012) points out that bank is the network of institutions and laws that provide variety of financial services. According to the categories compared with shadow banking system, we divided the traditional banking system into three species, which are central bank, commercial bank and specialized bank.

2.1.1 Central bank

Central bank is an institution which is established by the government, it is responsible for controlling the nation's money supply, interest rate and regulation of financial system which mainly includes the commercial banks and other savings institutions. The rest of functions of central banks are in the following:

- executing the monetary policy,
- setting up the official interest rate for their official currency,
- as the government's bank and others bankers' bank,
- administrating the country's foreign exchange rate and gold reserves.

Further expounds, central bank plays an important role in regulating the money supply which can stabilize the currency value; as others bankers' bank, central bank can centralize the reserves of other banks and issue the loans the other banks to be the lenders of last resort; also, central bank is the constitutor and executor of monetary policy, meanwhile, it can act as an instrument which is used for intervening the economy, at the same time, central bank can provide the financial services for government, issue the government bonds on behalf of government, raise funds for government and represent the government to join in variety of international financial organizations and participate various international financial activities.

The main fundamental difference between central bank and other financial institutions is that the main operation of central bank is the policy creation, but the central bank serves for macroeconomic objectives of government, which is decided by the position and nature of central bank.

2.1.2 Commercial bank

Casu (2016) states that the commercial bank is major financial intermediary in any economy. It is the main supplier of credit to the household and corporate sector and operate the payments mechanism. Commercial bank is one type of bank to as a financial institution which is responsible for undertaking the role of credit intermediary through the deposits, loans, foreign exchange and savings. The main business scopes are absorbing the public deposits, issuing loans and bill discounting, further, the commercial bank do not have any right to issue currency generally.

Commercial bank is different from central bank and specialized bank, it is a saving institution rather than investing institution, there are some fundamental functions about the commercial bank: adjusting economy, which indicates that the commercial bank can through their credit intermediary activities to transfer the funds shortage of various social sectors, meanwhile, it can realize the adjustment of economic structure, consumption to investment ratio and industrial structural under the monetary policy set by central bank and other national macroeconomic policy; credit creation, which states that commercial bank can issue the credit instrument and checks through the daily business activities, it can enlarge their own credit by exceeding their own capital and absorbing funds.

2.1.3 Specialized bank

Specialized bank refers to banks which have a specific business scope and provide specialized financial services. The emergence of specialized banks is the embodiment of social division of labor in the financial sector. One type of well-known specialized banks is investment bank, which is specializing in long-term investment business. Although investment bank is called the bank, but it cannot handle any traditional business what the commercial bank generally does, also it is different from the trust company or the investment company.

The fund sources of investment bank mainly rely on the bonds or stocks which are issued by themselves. The investment bank is not allowed to absorb any deposits, which is usually done by commercial bank. There are some main operations by investment banks:

- underwriting the issuance of securities,
- brokerage business,
- self-operated business, which means that the investment bank uses their own funds to do securities transactions,
- fee banking, which refers to counselor of mergers and acquisitions, securities economics research and other forms of financial advisory activities.

2.2 Non-bank financial institution

Non-bank financial institution (NBFI) refers to the financial institution which raises funds through some ways of issuing stocks and bonds, accepting credit commission, providing insurance and so on, then it uses all the funds which they raised to long-term investment. The most important deference between NBFI and bank is:

- the NBFI cannot accept deposits,
- equally important, NBFI does not have right to obtain a full banking license.

European Economy Paper (2012) states that the NBFI play a crucial role in the build-up and transmission of risks leading up to the financial crisis. Therefore, the economic policy maker would like to obtain a better understanding of NBIF and their potential contribution to the systemic risk since the start of the financial crisis.

Firstly, NBFI usually has structured products that include the securitization of product, which can derivate the product risk. There are some assets held by NBFI, for example, various mortgage structured product, which tend to more risky than initial thought by the NBFI.

Secondly, the NBFI commonly has high connection with the banks. This kind of connection can illustrate that the NBFI is able to transfer its own financial distress to the banks through the counterparty risk, which can lead to a financial distress on a whole financial system.

Thirdly, some of the NBFI have a huge size. If one of the big NBFI would get bankrupt, which could lead a financial distress at the level of the whole financial system, based on this circumstance, the market investors may be irrational to estimate the extent of the financial distress of the market, as a consequence, this situation would lead to a whole financial crisis to the financial system.

Further, Carmichael (2002) states that there are some basic types of non-bank financial institutions:

Risk-pooling institutions: the most common form of existence is insurance company, which underwrite the economic risks associated with illness, death, damage and other risks of loss.

Contractual saving institutions: it is also called as institutional investors, which could give individuals the opportunities to invest in a collective investment vehicles (CIV).

Market maker: the most common form of existence is broker-dealer institution, which offer a buying and selling price, and promote the transaction of financial assets.

Specialized sectorial financier: it usually provides a limited financial service to a specialized financial sectors, for example, real estate financier, leasing company and so on.

Financial service provider: it includes brokers, management consultants, financial advisors and fee-for-service.

2.3 Innovation of financial instruments

Mishkin (2013) states that the innovation of financial instruments illustrates that under the scope of the law, and the premise of liquidity and profit, the financial institution can flexible use and recompose the conditions of prices, interest rates, maturities, repayment methods and risk indexes to create new financial instruments to meet different needs of investors who have different levels and purposes, as a consequence, financial institutions can win investors' favor through the service. In the banking industry, the financial innovation has turned out a large number of instruments which only are used to be payment tools to become a new financial instrument which has strong liquidity and realize the financing function. The development of financial instruments has also gradually weakened the traditional division between commercial banks and other financial instruments, which mean that the commercial banks can securitize their liabilities, and other financial instruments can also make their liabilities to own payment and financing functions, thereby increasing the efficiency of the capital utilization. In the securities industry, the innovations in financial instruments include the issuance of special purpose stocks and securities with different functions, which could greatly improve the speed and scale of financing.

There are some motivations of innovation of financial instruments:

- Risk transformation: in order to transfer the risk of price, there are existence of innovative instruments, which include currency and interest rate swaps, futures, options and so on. Through the operation of these instruments, traders can transfer the risks caused by changes in the price of interest rates, exchange rates, stock indexed and oil prices. Nowadays, the financial markets in various countries have become increasingly influential, such financial instruments have been more and more widely used. For the purpose of transferring credit risks, there are appearances of loan sales, asset securitization and insurance for weak credit guarantee.
- Credit creation and credit growth: because of financial innovation, many innovative instruments have already functions of credit creation, such as junk bonds. Along with the development of information technology, investors can

be more easily to distinguish the size of investment risks. Some investors with a risk appetite are more willing to invest in long-term bonds with high returns and low credit ratings which are issued by small companies. Nowadays, the junk bonds have become an important part of the bond market, besides, some innovative instruments strengthen the credit of financial instruments mainly through the guarantees of real estate or assets that have not been used before, for example, the securities issued with a mortgage of real estate. Such financial instruments have huge innovation potential.

- Strengthen the liquidity: in order to meet this kind of demand, there are a large number of financial innovation instruments have enhanced the monetary or transferability of financial assets, for instances, the convenience of issuing notes, securities with a sell option and so on, which have opened up the second trading market for securitization of instruments. Some innovative instrument has enabled the free flow of funds between money markets and capital markets. Besides, there are a large number of international capital do transnational operation through financial investment, which have also significantly contributed to the international flow of financial instruments. The enhancement of liquidity has both positive and negative impacts on the rapid development of global financial markets and the global financial crisis.

2.3.1 Securitization

Fabozzi (2008) refers to the increasing proportion of the securities business in the financial business, credit flowing bank loans turn to debt instruments that can be bought and sold. Securitization is a form of financing to issue tradable securities in support of specific portfolio or specific cash flow. For example, bank issues guarantee for residential buildings, automobiles and leases to issue mortgage securities for investors to buy; enterprise issue financial bonds to raise funds for direct financing.

Due to a series of effects produced by securitization, there will be a profound change which be brought to the entire national economy and tremendous impact to exert on social and economic development. Its specific functions as follows:

- Capital socialization effect: in the form of securitization of raising funds, which has formed an internal trend that the larger scale of financing, the more dispersed of stocks. Due to the small nominal value of shares, the number of investors holding stock shares directly or indirectly in the society is increasing day by day. This shows that with the development of the securitization, the stock gradually dispersed among the members of the general public and the capital has become increasingly socialized.

- Operating scale effect: it means that with the expansion of production capacity, there will be a trend of decreasing of unit cost. The expansion of production scale is based on the expansion of capital scale.
- The survival of the fittest effect: securitization ha realized the mutual choice between investor and enterprises through the free transfer of capital securities. This mechanism of survival of the fittest has the dual function of eliminating out-of-pocket investors and out-of-business enterprises
- Resource allocation effect: securitization of survival of the fittest mechanism will inevitably lead to the rational allocation of resources. Under the effect of the survival of the fittest effect, investors are always investing more capital into a promising industry because of their high added value and high return rate. Therefore, it is determined that there will be a larger amount of social capital will inevitably flow into emerging industry, which could be conducive to the adjustment and conversion of the national economic structure.

2.3.2 Securitization products

Fabozzi (2008) states that the securitized product can represent a complicated part of the fixed-income market. In the following, there will several main types of structured finance instruments.

Asset-backed securities (ABS) are bonds or notes based on pools of assets, or collateralized by the cash flows from a specified pool of underlying assets. It has some advantages:

- Attractive benefits: it usually has higher return based on same credit rating.
- Higher credit rating: from the credit perspective, ABS is one of the safest investment vehicles. Also, it is similar to bonds, which will repay the principal and interest, but in addition, ABS has a protection of mortgage.

- Investment diversification: ABS market is a highly diversified market in terms of structure, returns, maturities and guarantees.
- Expected cash flow: the stability and predictability of cash flows for many types of ABS are allocated well.
- Low risky: as ABS is warranted by underlying assets, it provides a measure of protection against downgrade of ratings due to incident risk.

Mortgage-backed securities (MBS) is asset-backed securities the cash flows of which are backed by the principal and interest payments of a set of mortgage loans.

MBS can be classified into three types:

- Residential Mortgage-Backed Securities (RMBS), which deal with residential homes, usually for single family.
- Commercial Mortgage-Backed Securities (CMBS) are for commercial real estate such as malls or office complexes.
- Collateralized Mortgage Obligations (CMOs) are securitizations of mortgage-backed securities.

Collateralized debt obligations (CDOs) consolidate a group of fixed income assets such as high-yield debt or asset-backed securities into a pool, which is then divided into various tranches.

CDOs can be classified into three types:

- Collateralized bond obligations (CBOs) are CDOs backed primarily by corporate bonds.
- Collateralized loan obligations (CLOs) are CDOs backed primarily by leveraged bank loans.
- Commercial real estate collateralized debt obligations (CRECDOs) are CDOs backed primarily by commercial real estate loans and bonds.

Generally, there are three parties in a **credit default swap (CDS)** over-the-counter (OTC) contract standardized by the International Swaps and Derivatives Association (ISDA), including the reference entity, the protection buyer, and the protection seller. In simple terms, if the default event occurs before the maturity date, the protection seller should make the default payment to the protection buyer; in contrast, if there is no default before the maturity date, there is no need for the protection seller to make the default payment to the protection buyer. Moreover, the protection buyer is required to make a periodic premium payment as a compensation of the protection to the protection seller until default or maturity.

2.4 Shadow banking system

The shadow banking is a system refers to the non-banking financial intermediaries that the bank loans are processed into the securities and then traded in the capital markets. Although it is a non-banking institution and not regulated as other normal banks, it has the similar functions and services as the traditional commercial banks.

The concept of the shadow banking system was put forward for the first time in 2007 by Paul McCulley, who is the executive director of Pacific Investment Management Company. The shadow banking system, also named the parallel banking system, usually consists of securitization vehicles, investment banks, hedge funds, money market funds, mortgage companies, SIVs (Structured Investment Vehicles), etc. These non-banking components are financial institutions that hold a large number of securities, bonds, and complex financial instruments according to the leverage. While promoting the prosperity of the financial markets, the high level of the financial leverage caused by the shadow banking system has brought tremendous vulnerability to the entire financial system and the rapid development of it was considered one of primary drivers of the subprime mortgage crisis in 2008.

Lemma (2016) states that the shadow banking system refers to the credit intermediary system which includes various relevant institutions and business activities, and it is free from the traditional banking supervision system and it may cause systemic risk and regulatory arbitrage. International monetary fund (2013) states that "*shadow banks refers to many financial institutions that act like banks are not supervised like banks*".

“Economist Paul McCulley coined the term “shadow banking” in 2007, but credit has existed outside the banking system for centuries”.[1] Shadow banking is not a new phenomenon, but the term only recently came into widespread use, and there is no single agreed definition. The Financial Stability Board (2013) broadly describes shadow banking as “credit intermediation involving entities and activities outside the regular banking system”. The People’s Bank of China (2013) used a definition of shadow banking that seeks to take the particulars of their own “national situation into full account.” They defined “China’s shadow banking system as credit intermediation involving entities and activities outside the regular banking system” that serves to provide “liquidity and credit transformation” and “which could potentially” be a source of “systemic risk or regulatory arbitrage.”

Federal Reserve Bank (2012) states that in the traditional banking system, banks usually act like an intermediation which is standing between the savers and borrowers. Commonly, the savers make deposits in banks due to the high levels of trust, which can be used by banks to create the loans to borrowers, savers furthermore obtain the equity and debt of the banks. This kind of lending can be concluded as direct lending. Relative to the direct lending, the shadow banks can act as credit intermediation which would provide savers with more information and risk economies of scale by reducing the costs involved in monitoring borrowers and by facilitating the investments to be a more diverse loan portfolio.

Further, we can find out that the shadow banks have similar functions and similar risks to traditional banks, which are associated with maturity, credit and liquidity transformation. Then we know that the shadow banking is not only a single category, but also encompass a very broad range of heterogeneous activities.

The following Fig 2.1 shows the change of China’s shadow banking sector which can help to get a quick view about Chinese shadow banking sector. (the data after 2015 is not available).

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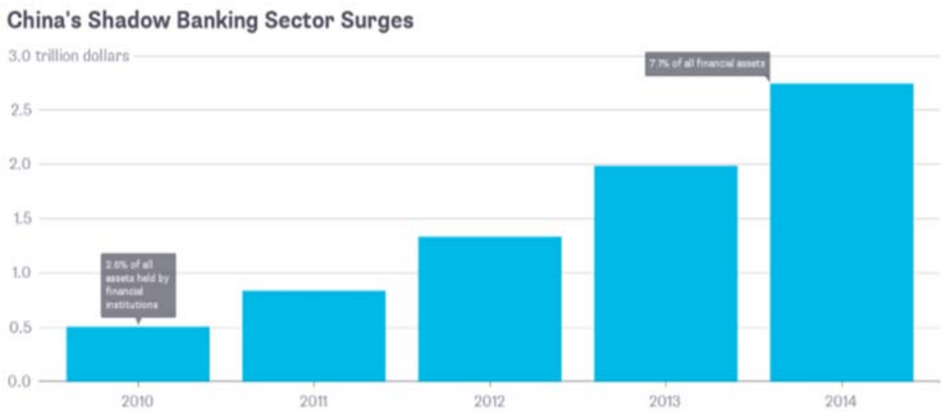
[1] Bloomberg QuickTake, 2018. Shadow Banking. [online database]. [cit 24.01.2018] Available from internet: https://www.bloomberg.com/quicktake/shadow-banking.

Fig 2.1 China's shadow banking sector surges



Source: Bloomberg QuickTake, 2018

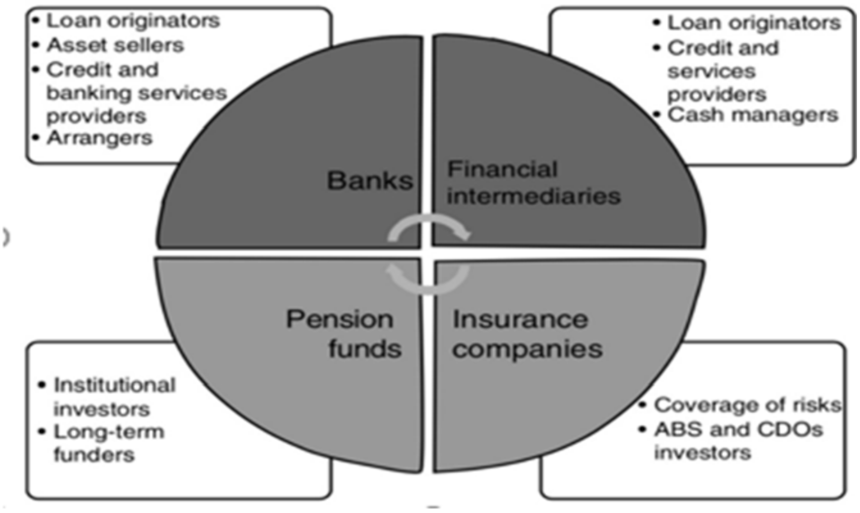
2.4.1 The role of banks in the shadow banking system

FSB (Financial Stability Board) published Global Shadow Banking Monitoring Report 2016 in 10 May 2017 and the data up to end-2015 from 28 jurisdictions, representing over 80% of global GDP. It announced that OFI (Other Financial Intermediary) assets rose from $89 trillion in 2014 to $92 trillion in 2015 in 21 jurisdictions and the euro area due to a combination of higher equity valuations and an increase in non-banking credit intermediation. The size of OFIs was equivalent to approximately 150% of total GDP at end-2015, exceeding the previous high-point of 139% before the financial crisis. Loans extended by OFIs grew in 14 jurisdictions and the euro area since 2011. Moreover, the narrow measure of shadow banking, includes non-banking financial entity types considered by authorities involved in credit intermediation where financial stability risks from shadow banking may occur, increased the financial stability risks by 3.2% to $34 trillion in 2015 for the 27 jurisdictions.

G20 Data Gaps Initiative Phase II (2016-20) stated that "The G20 economies to enhance data collection on the shadow banking system by contributing to the FSB monitoring process, including through the provision of sectoral accounts data…". The main purposes of FSB include monitoring trends outside of the banking sector, detecting where the risks associated with the shadow banking may arise, and detecting adaptations and cross-border regulatory arbitrage.

The following Fig 2.2 shows the roles of different financial institutions in shadow business, which can be used to summarize how the shadow business works in general.

Fig 2.2 The roles in shadow business



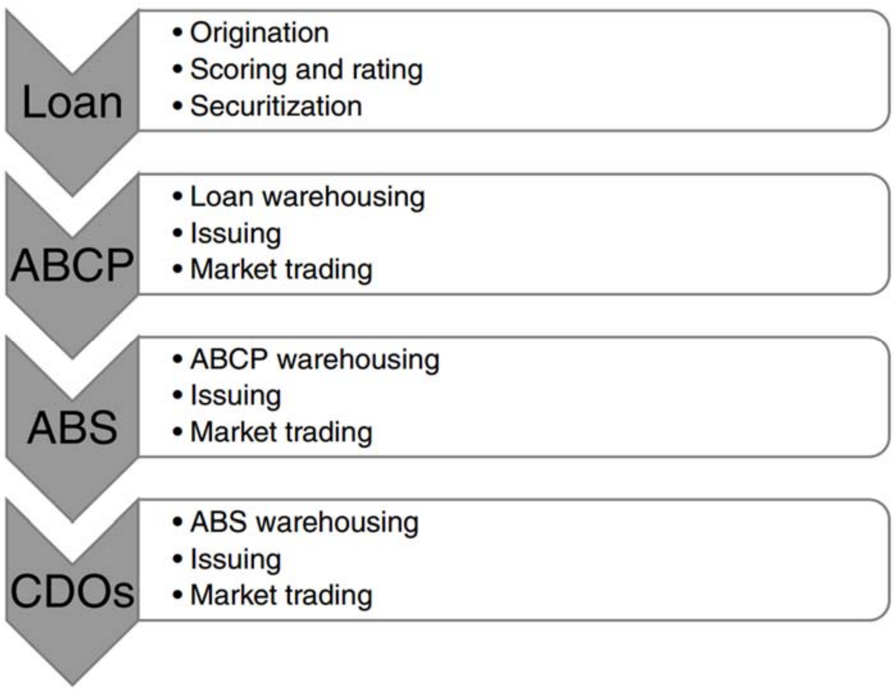
Source: Lemma (2016), Page 81.

2.4.2 Shadow banking operations

The main purpose of the shadow banking operations is to create securities, which support the circulation of the capital, from the surplus units to the deficit units. The shadow banking operations can be considered a series process of shadow credit intermediation and usually include a large number of affairs associated with specific purposes, such as the credit enhancement and the maturity transformation.

The shadow banking system is somehow similar with the traditional banking since shadow banks also provide the credit and increase the liquidity of the financial sectors. However, what makes the shadow banking system different from the traditional banking is that the shadow credit intermediation does not occur in an integrated way within a sole intermediary, while all stages in the traditional banking are achieved under a single entity. Fig 2.3 below summarizes how the loans are transformed from the beginning to the end, namely from the real economy to the financial securities, under a legal framework, which are loan, asset-backed commercial paper (ABCP), asset-backed security (ABS) and Collateralized debt obligations (CDOs).

Fig 2.3 Shadow credit intermediation process and regulated activities.



Source: Lemma (2016).

Furthermore, in order to fulfill the requirement of controlling of the shadow credit intermediation process and ensuring the well-functions, it is necessary to establish the externalities produced by the shadow banking system, which can be managed by the interventions, in the worldwide financial system. Besides, it is important to verify the transparency of economic conditions and the symmetry in the distribution of benefits.

2.4.3 Shadow banking risks

As well as the traditional banking, the shadow banking system is faced with risks. There are two types of risks: one is coinciding with the instabilities of the entities in the shadow banking system; and the another is associated with the shadow banking operations, namely the unsustainable use of the financial leverage, the unsound financial practices within the credit transformation, and so on.

Lemma (2016) state that due to the current regulation of the traditional banking industry, which can be used to deduce that the points of concentrating on risks for banks are that the need to understand whether the traditional rules suit the shadow banking system. Specifically, it should be noted that there is a growing attention being paid to risks which are taken by banks, it corresponds to a significant system of guarantee, preordained to balance the negative effects of management events. Also, undoubtedly, there are some similar problems relative to traditional banking industry, which occur in the shadow banking system. However, it could be determined that these various risks might be amplified in the shadows, due to the limited knowledge of some conditions in process of operations. There is one point which people should be aware that in sufficient levels of transparency and the complications in the transportation of information which could result to conditions of uncertainty, it is unable to preserve the system from matching the competitive equilibrium necessary to ensure the maximized social welfare, at the same time, it also used to prevent the unjustified individual extra profits.

There will be a table about the areas of risk in the following:

Tab 2.1 Areas of risk

Source: Lemma (2016).

Also, there are a lot of risk factors which could measure the size of risk in shadow banking system, meanwhile, there should be various risk assessments in the following as table 2.2:

Tab 2.2 Rik assessment

Risk factor	Event	Control measure	Prospective of regulation
Counterparty default	Non-fulfillment	Accuracy of credit scoring	Standard measure of capital adequacy
Roll over risk	Failure to repeat the operation	Analysis of market demand	Monitoring
Contamination risk	Errors in the mix of assets and in the wharehousing	Tracking of the ABCP, ABS, and CDOs	Identification of asset and legal entity
Tail risk	Remote negative events	Analysis of the operation	Additional backstops
Organizational risk	Mistakes in the intermediation process	Analysis of any stage of the shadow credit intermediation process	Monitoring
Sustainability risk	Lack of margins	Identification of the stages	Accounting controls
Runs	Unexpected reimbursement requests	Backstops and prohibitions	Regulatory constraints
Hidden leverage	Lack of transparency	Limit to debt	Regulatory constraints
Mispricing	Mistakes in the evaluation	Additional accounting control	Organizational and accounting constraints
Derivative transactions	Errors in the design of the operations	Analysis of the contracts and financial instruments	Central counterparty intervention
Governance risk	Errors in the organizational structure	Analysis of the legal entity, conflicts of interests, and potential financial pressures to the sponsors and the arrangers	Monitoring

Sources: Lemma, 2016

3 The shadow banking system in European Union and China

Nowadays, there is expansion of shadow bank in both European Union and China, due to the different national conditions, which would lead to a different situation of shadow banking system in European Union and China. In this chapter, there will be a comparison between shadow banking system in European Union and China to introduce the existing situation in both European Union and China.

3.1 The shadow banking system in China

Nowadays, the shadow banking system have become an important role in China, which developed quickly in recent years. Due to the different national conditions, Chinese shadow banking system looks like more different with other countries' shadow banking system, in the following, there will be specific information to help know it better.

3.1.1 The special definition of shadow banking system in China

Because of different national conditions, China is a socialist country, which is differen with other western countries that are capitalist countriess, for example, the Europe, China has its own definition in allusion to shadow banking system.

China's definition of shadow banking is different from that of some developed countries. In 2010, Xiaochuan Zhou[2] pointed out that China's shadow banking mainly depends on traditional banking. In 2012, the Survey and Statistics Department of the People's Bank of China made a preliminary definition of China's shadow banking in the article entitled "Connotation and Denotation of Shadow Banking": An entity or quasi-entity that is engaged in financial intermediation and has similar credit, maturity or

[2] Governor of People's Bank of China.

liquidity conversion functions as a traditional bank but is not subject to Basel III or equivalent regulatory status. A clear official definition appeared in the "Notice of the General Office of the State Council on Strengthening Supervision over Shadow Banks" (Guo Ban Fa [2013] No.107), which stipulates that China's shadow banking mainly includes three categories: First, there are financial intermediaries that do not hold financial licenses and are completely unsupervised, which include new online banking companies and third-party financial institutions; second, credit intermediaries that do not hold financial licenses and that lack regulatory oversight include financing guarantee companies, Small loan companies and so on; third, institutions hold financial licenses but they have under-regulated or circumvented regulatory businesses, including money market funds, asset securitization and some wealth management businesses. However, this definition from the regulatory perspective of the institution does not reflect the overall situation of the domestic shadow banking.

China's shadow banking institutions mainly include non-bank financial institutions such as trusts, brokerages, funds and subsidiaries, guarantee companies, small loan companies and peer to peer (P2P) lending platforms; business products include trust plans, trust beneficiaries, and repurchase of bills , interbank payment, outsourcing investment, asset management plan, interbank wealth management, bank off-balance sheet wealth management, bill discounting, trust loan, credit assets transfer, entrusted loan, small loan company loan, peer to peer (P2P) network loan, etc.

The operation of the mainstream shadow banking business involves the issuance of wealth management products by banks or the raising of funds through inter-bank liabilities (including issuance of interbank certificates of deposit), the transfer of trust beneficiary rights through the channels of non-bank financial institutions such as trusts, brokers and funds, the targeted asset management plan for brokerages, Specific asset management business, or other banks as the channel for the dual acquisition of credit assets, the purchase and sale of negotiable instruments, interbank payment business, the final funds to trust loans, entrusted loans, uncollectible bank acceptances and other forms provided to the real business Or make other investments. There are also a few shadow banks (small loan companies, P2P lending platforms, etc.) that limit lending by breaking the regulatory barrier with crowdfunding, P2P and other forms of Internet finance. In this way, non-bank financial institutions that do not qualify for deposits and loans to become the shadow banking system chain and exercise the essence of deposits and loans and break through the corresponding regulatory. The huge banking system continuously innovates its business to chase higher profits in the environment of financial repression and regulatory constraints, and conducts regulatory arbitrage with other financial institutions attached to the banking system. As a result, the shadow banking business in China is essentially a loan-like business. China Shadow Bank did not form a complete credit chain between various agencies and businesses. Instead, it acts as a bank shadow and forms a complementary relationship with traditional banks.

3.1.2 The development of shadow banking system in China

Xu Yang (2012)[3] state that in response to the 2008 global financial crisis, various countries injected a large amount of liquidity into the market to stimulate the economy. As a result, the global liquidity flooded and the currency surged in the traditional banking industry. The rapid growth and high yield of China's shadow banking has attracted the participation of many non-bank financial institutions such as trust companies, securities companies, asset management companies, financial companies, financial leasing companies and financial asset management companies. Due to the high deposit reserve ratio and the impact of interest rate control, the expansion of credit of traditional banks have been affected. In order to obtain higher profits, the traditional banks rely on the cooperation with shadow banking to get rewards.

China's financial control led to the weakening of the intermediary function to traditional banks which could turn the deposits to investment. The financial disintermediation tended to aggravate and the shadow banking expanded continuously. In the first half of 2011, monetary policy did not significantly tighten. However, due to the diversion of funds from shadow banking, many funds of banking industry flowed to local governments, the real estate industry and large state-owned enterprises. Small and medium-sized enterprises (SMEs) obviously felt the credit crunch. While the funds of

[3] Xu Yang (2012), the development and impact of shadow banking system in China, availiable only in Chinese, was published in 2012.

banking system were getting tighter, there were a great deal of speculative funds pursued high returns, which were flooding the market. Driven by the speculative atmosphere in the whole society, many enterprises are interested in industrial investment, they invested funds in financing and starts the financial business. State-owned enterprises would also use their advantages to obtain funds for "entrusted loans."

China's strict market access restrictions have underdeveloped Chinese financial institutions. Regulated and under-determined market interest rates (especially deposit interest rates) have led to the substitution of China's financial development, which means that there was a substitution of informal finance for formal finance. Strict financial controls have allowed informal finance to grow rapidly with new demands in the new era. The rapid growth of more and more non-bank financial institutions provided the possibility for the growth of shadow banking in China. Some financial institutions which had similar business and related businesses with banks gradually grew and developed, which lead to a result that they gradually became capable of providing funds. That is the start of shadow banking system in China.

There is a typical financial system which is bank-led indirect financing in China. Over the past 30 years since the reform and opening up, indirect financing dominated by bank loans has accounted for 89% of the total social financing. However, with the rapid development of global financial markets and deepening of finance, profound changes have taken place in the financing pattern since the beginning of the new century. The proportion of financing scale of banking institutions in total social financing has been gradually declining. The control of the monetary policy of the Central Bank was also gradually realized by controlling the credit scale. However, with the advent of financial disintermediation and a large amount of off-balance-sheet assets in recent years, shadow banking has developed rapidly, which lead to a new phenomenon that the amount of credit growth in the balance sheet could no longer completely reflect the funding and demand situation of the entire society. Rapid expansion of total financial volume, diversified financial structure, continuous innovation of financial products and financing tools, commercial banks' off-balance sheet business had showed obvious substitution effect on loans, in addition to the rapid development of other financing methods, which result to the functions of bank loans in economic development had gradual changed.

Since 2011, as Chinese government had tightened their monetary policies, banks had begun to reduce their credit exposure. In addition, the capital needs of the still-thriving real economy were hard to be met. Real estate and local infrastructure construction need more funds. Under the favorable expectation of a short-term prospect, the real estate industry with a predominant national economy has stepped up the fight for funds, pushed up already-rising interest rates and further increased the difficulty of obtaining loans for private enterprises and small and medium-sized enterprises (SMEs). These kinds of vulnerable enterprises resorted only to the informal banking, which were shadow banks, as a result, it led the further rising and growth of shadow banking in China.

At the same time, in order to circumvent the credit control of the central bank, some financial institutions shifted their credit business to off-balance-sheet businesses to financial markets, which could help them to escape from the financial regulation, and in addition to the high negative inflation rate, resulting in negative interest rates, a considerable number of residents and enterprises were reluctant to keep depositing money in banks. Instead, they were reducing bank savings deposits and placing more funds in bank financing, fund investment, insurance policies and private lending. Thus there is a start of forming a financial disintermediation. In summarize, the control of interest rates in China was an important reason for stimulation growth of shadow banking. Hanny Sander (2011)[4] states that due to the low interest rates of bank deposits, the number of entrepreneurs and other affluent individuals with excessive savings is steadily increasing. When the actual deposit rate is negative, they do not intend to put money into the bank but instead invest it through informal channels to charge 20% to 30% interest annually.

[4] Hanny Sander, China's shadow bank, a report from Financial Times, published in 8th April 2011.

The fundamental reason for the emergence of China's shadow banking is that the strict financial control from the Chinese government had led to the failure of the formal finance, especially the traditional ones, to meet the needs of the real economy. Therefore, the informal banking sector, shadow banking, fills the financial market gap. At the same time, bank savers and other funding providers are reluctant to accept very low (even negative) real interest rates and to transfer bank deposits to financial products such as wealth management, funds, trusts, insurance, private lending, etc., for higher yields to provide the necessary funds for shadow banks. Meanwhile, the development of a large number of non-financial institution has played boost role, also, more and more financial institutions are pouring into the shadow of banks.

3.1.3 The composition of shadow banking system in China

There are various participants in shadow banking system in China, there will be four mainly participants to be introduced.

Endogenous shadow banks from commercial banks. At the present stage, China's commercial banks still hold the dominant position in the financial markets. The huge commercial banking system can provide abundant customer resources for other shadow banking departments such as hedge funds, trusts, money market funds and guarantee companies. Take the recent rise of bank financial products as an example. The underlying assets of such wealth management products can be loans, bank acceptances, corporate receivables rights and other asset portfolios. Commercial banks cannot use their own funds to transfer their risks to the trust product promoters and investors. And trust assets belong to off-balance-sheet assets, so that commercial banks can bypass supervision, which could lend funds to target customers who cannot get loans due to legal policy and other reasons. In summary, commercial banks can be said to obtain a lot of benefits in cooperation.

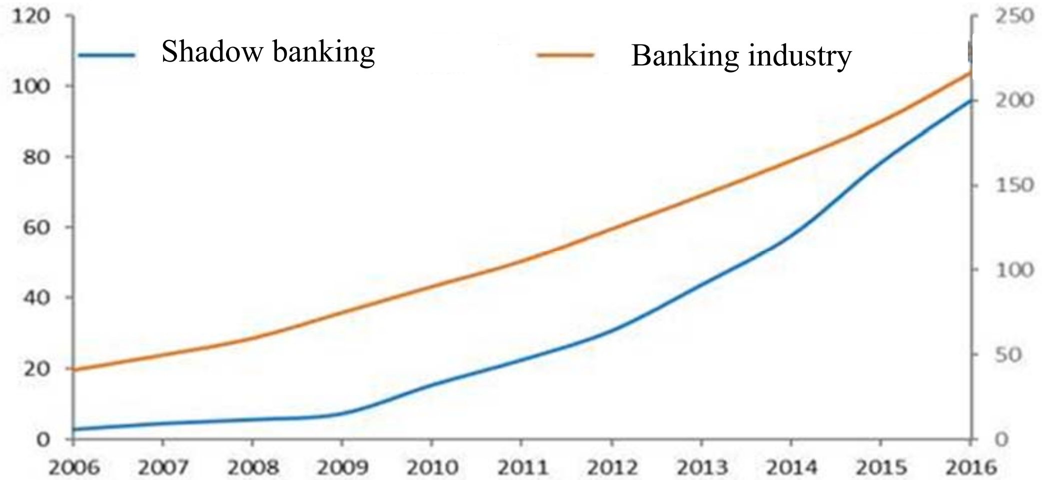
Non-banking financial institutions. This part of the financial institutions mainly includes trust and investment companies, small loan companies, financial leasing companies, financial consumer companies, corporate finance companies, financial auto companies and so on. This type of company has developed rapidly in recent years and some of them has been incorporated into the regulatory system.

Non-financial institutions approved by government. For example, pawnshops, guarantee companies, youth mutual aid and entrepreneurial credit belong to this category. Such agencies have a more detailed division of functions and can coordinate some resources to support specific clients. Due to the increasing demand for financial markets, these types of institutions have also rapidly grown in recent years.

Private lending and underground banking. In recent years, with the rising interest of banks, the tightening of credit and the suppression of the housing market, private lending is showing explosive growth. According to the "China Private Lending Analysis" published by China International Capital Corporation in October 2015, it is estimated that the balance of private lending in China has reached 13.8 trillion yuan, accounting for about 33% of the total size of China's shadow banking loans, equivalent to the total bank loans 7%.

Tab 3.1 Asset size (trillion RMB)

Source: Wind Information Co., Ltd (2017)



From tab 3.1, we can easily conclude that the development of shadow banking system has been expanded greatly from 2006 to 2016, meanwhile, the gap of asset size between shadow banking and banking industry has been diminished in this period, which can be used to conclude that the shadow banking has been an important member in banking industry in China.

Tab 3.2 The estimated scale of shadow banking in China (billion RMB)

Main types \ Years		2010	2011	2012	2013	2014	2015	2016
The bank's non-traditional credit business	Entrust loans	3.64	4.41	5.17	7.22	9.33	10.93	13.20
	Undiscounted bankers' acceptances	4.13	5.15	6.21	7.00	6.87	5.85	3.90
Non-bank financial institutions asset management business	Fund trust balance	2.67	3.82	5.83	9.25	12.02	14.33	15.91
	The scale of the assets management business by the securities firm		0.28	1.89	5.20	7.96	11.88	17.82
	Fund company asset management business scale		2.19	3.62	4.22	5.88	12.60	16.89
	Insurance asset management business scale	2.97	3.52	4.05	4.97	6.06	7.72	10.06
Other financing businesses	Finance company loan	0.70	0.81	0.93	1.08	1.27	1.47	1.86
	P2P network loans	0.35	0.39	0.66	0.86	1.30	1.73	2.04
	small-loan company					0.06	0.23	0.62
	Financial lease		0.31	0.51	0.73	0.89	0.95	0.93
	Financing guarantee	0.99	1.65	1.90	2.22	2.34	2.20	2.20
Shadow banking		15.45	22.54	0.77	43.72	57.72	78.47	95.94
Traditional banking		0.04	104.93	4.22	43.99	64.60	187.32	216.19

Source: own calculations.

From the tab 3.2 above, from 2010 to 2016, the average compounded annual growth rate (CAGR) of non-traditional credit assets of banks was 11.9%, and the average compounded annual growth rate (CAGR) of assets managed by non-bank financial institutions was 43.6%. The average compounded annual growth rate (CAGRs) of other financing businesses corresponding to the size of assets at 20.8%, during which time the rapid growth in the business of non-bank financial institutions contributed the most to the expansion of shadow banking. In 2016, the non-bank financial institutions accounted for 74.2% of the total assets under management, the non-traditional credit assets of banks accounted for 17.8% of the total assets and other financing assets accounted for 8% of the total assets.

3.1.4 The characteristics and impact of shadow banking system in China

There are two main features of shadow banking system in China.

Direct financing as main function. Unlike the types of financial transactions in the Western shadow banking system, the shadow banking system in China is based on direct financing. Since the development of the financial market system started relatively late in China and it is still in its infancy, financial innovation products are few and standardized securitization channels have not yet been formed. Therefore, China's shadow banks mainly serve the real economy, and together with the financing and equity financing of commercial banks to solve the real economy and the efficiency of the supply of funds.

Financial instruments are relatively single. As China's investment banking and investment funds are relatively backward, China's shadow banking has fewer types of financial instruments and a simpler design. At this stage, the shadow bank mainly focuses on financial products. Other examples include mortgage loans and credit facilities of small loan companies Loans and so on. Its leverage is not as high as US financial derivatives.

Also, there are two main impacts of shadow banking system in China.

Interest rates more market-oriented. Interest rate of China’s bank is determined by the central bank, which can be only adjusted slightly, the overall of it cannot change. However, shadow banks are exempt from the interest rates set by the central bank and the lending rates are relatively free. Generally, the enterprises which are looking for shadow bank loans, they cannot get loans from the normal commercial banks, so the risk of lending loans to these kind of enterprises is slightly higher, as a result the interest rate will be slightly higher. On account of the shadow banking, there was a large loans of slightly higher interest rates in China and interest rates were more market-oriented.

Increase the risk of the financial system. The traditional bank's internal management system is well established and its risk review is rigorous, also, the externalities are also supervised by the Chinese banking regulatory commission (CBRC), which is generally safe. The shadow banking system has a relatively short history of development, some things are not established well yet, the system of institutions may not be perfect, and the external supervision is very weak, more like "brutal growth." The specific risks of shadow banking are not accurate, but they are surely riskier than those of traditional banks. If the shadow banking problems go down on a large scale, they may spread to other areas of the financial system.

3.1.5 Risk of shadow banking system in China

Compared to other countries, China's supervision of commercial banks is more stringent. High deposit reserve ratio and strict control of loan quotas make the efficiency of bank allocation of funds decreased and increased costs. As a result, funds are motivated to avoid banks and appear so-called financial disintermediation. The banks themselves also have the incentive to package their loans as financial products, also, the cooperation within banks and trust, in addition to other forms of cooperation weakened their supervision to become part of the shadow banking sector. At present, China's shadow banks are mainly concentrated in the areas of off-balance sheet assets (wealth management products and entrusted loans) and non-bank financial institutions (such as trust companies) of commercial banks. Overall, shadow banking has three major risks.

Shadow banking risks shifting to the government. In the shadow banking development process, savers have gained higher profits, lenders have received financial support, financial intermediaries, which includes commercial banks that they also charge spreads and fees, earn profits, and the government may become the biggest loser in process. Shadow banking has a central role similar to that of traditional banks, but at the same time they are lack of direct liquidity support and deposit insurance mechanisms like central bank and they are vulnerable to run-away impressions. Therefore, the shadow bank's overall risk eventually passed on to the government body, leaving the crisis which will inevitably require the government to pay.

Shadow banking brings wrong pricing risk to the market. At the micro level, shadow banks enjoy implicit deposit guarantees that provide yields which could appear to be risk-free for savers. In this way, more and more profitable but less risky products are introduced into the financial markets, creating a strong attraction for funds. As a result, those low-risk, low-yielding assets may not be able to give a higher "risk-free rate of return", which could lead them be disable to attract funds. Misallocation of resources caused by the disorder of the price system may directly affect the development of the real economy. In practice, some shadow banks have disrupted macro-control to some extent in the industries and fields where the formal banks cannot issue loans by investing funds in local government financing platforms, real estate, and some industries or fields which belong to high pollution, high energy consumption, or overcapacity, etc., to a certain extent, affecting the pace of adjustment of economy structure.

Shadow banking itself has operational risk and liquidity risk. Relative to the formal loan approval process of mature bank, the shadow bank's fund utilization does not have a complete and strict system to follow. It does not rule out the introduction of more risks or even illegal acts during the operation due to human reasons. In particular, some shadow lenders with financing functions, such as small loan companies, pawnshops and financing guarantee companies, which are blindly expanding and are prone to over-run and get other problems. On the other hand, many shadow banking products and their own designs are inherently flawed. For example, there is a clear liquidity risk in the trust company's pooling business and some long-term infrastructure investment reliance on short-term trust financing. As a result, shadow banking risks have largely accumulated outside the regulator's view, once it happens, which would lead more destructive influence than the visible risk does.

3.2 The shadow banking system in European Union

Similar to China, the shadow banking system has developed quickly in European Union recent years. Moreover, it has some differences with shadow banking system in China, in the following, there will be more specific about the shadow banking system in European Union to help to establish the comparison of the shadow banking system in China and European Union.

3.2.1 Development of shadow banking system in European Union

Jeffers (2016) states that there two definitions of shadow banking system (SBS) made by the Financial Stability Board. The broad one is that SBS states that the credit intermediation involving entities and activities outside the regular banking system, and the narrow definition states that SBS is a system of credit intermediation that involves entities and activities outside the regular banking system, and raises systemic risk concerns, in particular by maturity or liquidity transformation, leverage and flawed credit risk transfer, and regulatory arbitrage concerns. In addition, the European Economic and Social Committee (EESC) highlighted that there are many ways in which shadow banks replicate traditional banks, and some shadow banks are part of traditional banks.

The expansion of banks into mortgage area and markets outside Europe has brought more risks to the banks. To deal with this situation, banks choose to securitize their loans, and this move has transferred the crisis to the shadow banking system. The system can be divided into two parts: Monetary Financial Institution (MFI) and non-monetary financial institution (non-MFIs). Credit institutions and money market funds both belong to MFIs, while investment funds, financial vehicle corporations, public financial corporations and hedge funds are all non-MFIs.

The shadow banking system has been expanding its size and improving its role in the euro area in recent years. The financial assets held by financial institutions other than banks, including shadow banks, have doubled since 2005. Although the increase slowed in 2016, these assets still account for one third of the entire financial system in euro area. However, unlike the US market, traditional banks are still the leading financial intermediaries in the euro area. The assets of traditional banks completely exceed those managed by shadow banks. Investment funds (IFs), financial vehicle corporations (FVCs) and money-market funds (MMFs) constitute over half of the shadow banking system. The growth of assets in these three fields has been led by the expansion of the non-money market investment funds industry.

Different European countries have quite diverse banking systems due to what kind of role the government plays in each country. One common thing among European banks is the "coordinated" capitalism produced by public actors' involvement.

The similarity between traditional banks and shadow banks is that they both intermediate credit. The difference is that the intermediation by traditional banks happens under different roofs, while that by shadow banks does not. In the SBS, intermediation occurs in several stages of non-banking intermediaries. The vertical division of the credit intermediation usually done by traditional banks now occurs in one of the stages. In the aspects of information, transaction costs, and risk mitigation, the advantage of shadow banks is obvious since financial flow is created throughout bank intermediation. These financial flows that happen outside banks, for example, flows between households and corporations or government via non-bank credit intermediaries, when they involve leverage and maturity transformation, they will be labeled as shadow banking intermediation, even when some are not. The two features often create risks. From the global financial crisis, people now know that shadow banking system and traditional banking system are closely connected. However, because the universal banking system differs in European countries, the particular form of interconnectedness also differs.

Jeffers (2016) states that the "Simple, Transparent and Standardized (STS) securitization" currently has been carried out in Europe. Actually euro area banks are dependent on funding from other financial institutions, such as securitization vehicles. Traditional banks and shadow banks are closely interconnected even though the systems are different in certain degrees among the countries. Issuance largely decreased in Europe after the great recession in 2008. Issuance continued, though at lower levels, and the ability to of using securitized products increased demand. In the euro area, securitization transactions mainly consist of loan securitizations, more specifically, household mortgage loans. Residential mortgage-backed securities (RMBSs) are the products of these transactions. Securitization transactions also consist of commercial mortgage loans and consumer credits. Other kinds of transactions like "securitization of commercial paper (asset- backed commercial paper or ABCP), bonds, trade receivables of non-financial corporations, tax receivables of general government, and re-securitizations of already securitized assets, and it also play important roles. In Europe, United Kingdom, Netherlands, Spain, and Italy are countries that issue the most securitized products. Since 2010, there exist signs in Germany, Netherlands, United Kingdom, and Italy that market-based demand has emerged. By far, in most European countries, residential mortgage-backed securities (RMBSs) has been the most remarkable asset among all the classes of assets.

3.2.2 Existing situation of shadow banking system in European Union

At the beginning, there will be some figures to describe the distribution of European Union bank's exposures to shadow banking entities by country of reporting institution and domicile of shadow banking entity, which can be used to describe the specific existing situation of shadow banking system in European Union.

Fig 3.1 Distribution of European Union bank's exposures to shadow banking entities (in billion euros)

B/SB	DE	FR	GB	IE	JE	KR	KY	LU	NL	RU	TR	US	O-EU	RW	Total
AT	0.2	0.0	0.3	0.2	0.0	0.1	0.2	0.2	0.3	0.8	0.1	0.6	3.1	0.7	6.8
DE	28.1	0.8	5.1	9.4	1.3	0.4	2.9	6.9	1.7	2.3	3.9	33.5	2.2	7.6	106.0
FR	0.5	16.2	3.7	1.9	0.2	2.9	4.9	1.4	2.0	0.5	0.5	30.1	2.7	10.9	78.3
GB	5.2	4.8	44.7	19.8	14.7	7.8	24.9	12.0	3.5	1.5	3.0	84.0	4.0	54.5	284.4
IT	0.0	1.3	2.8	2.6	0.4	1.3	0.0	2.5	0.1	2.1	7.5	0.5	2.9	2.9	26.8
LU	1.1	0.7	0.8	0.4	0.0	0.0	0.3	2.5	3.0	0.2	0.0	0.1	1.0	0.4	10.4
O-EU	0.5	1.4	1.5	1.1	0.5	2.3	3.2	3.3	3.2	2.9	4.5	2.8	12.8	6.7	46.8
Total	35.5	25.1	59.0	35.4	17.0	14.8	36.4	28.8	13.8	10.4	19.5	151.5	28.7	83.5	559.4

Sources: Abad (2017)

Fig 3.2 Distribution of European Union bank's exposures to shadow banking entities (as % of GDP of country of reporting bank)

B / SB	DE	FR	GB	IE	JE	KR	KY	LU	NL	RU	TR	US	O-EU	RW	Total
AT	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.0	0.2	1.0	0.2	2.2
DE	1.0	0.0	0.2	0.3	0.0	0.0	0.1	0.3	0.1	0.1	0.1	1.2	0.1	0.3	3.9
FR	0.0	0.8	0.2	0.1	0.0	0.1	0.2	0.1	0.1	0.0	0.0	1.5	0.1	0.5	3.8
GB	0.3	0.3	2.4	1.0	0.8	0.4	1.3	0.6	0.2	0.1	0.2	4.4	0.2	2.9	15.0
IT	0.0	0.1	0.2	0.2	0.0	0.1	0.0	0.2	0.0	0.1	0.5	0.0	0.2	0.2	1.7
LU	2.4	1.5	1.8	1.0	0.0	0.0	0.6	5.5	6.5	0.5	0.0	0.1	2.1	0.8	22.9
O-EU	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	1.1
Total	0.3	0.2	0.5	0.3	0.1	0.1	0.3	0.2	0.1	0.1	0.1	1.2	0.2	0.6	4.3

Sources: Abad (2017)

From Fig 3.1, Fig 3.2, we can easily get an overview information on mapping the interconnectedness between European Union banks and shadow banking entities. Also, Abad (2017) states that the exposure of EU banks to shadow banks has great effect globally and locally. Approximately 27% of the total exposures domicile in the United States. 65% of the exposures are securitizations, non-MMF investment funds and finance companies. Shadow banking entities are grouped by the types of countries. EU banks do not have much individual focus on shadow banking system. Because different banks are often affected by the same shadow bank, it is quite possible that the EU banks will be influence by common sources of vulnerability in times of stress.

European Commission (2012) states that The European shadow banking system is smaller than that in the United States, measuring at about half the size of total banking assets, as opposed, it equals to the size of total banking assets in the US. European countries with relatively larger shares in the global shadow banking system include 13% for UK intermediaries, 8% for Netherland intermediaries, 6% for French intermediaries, and 5% for Danish intermediaries.

Doyle (2016) states that there are several kinds of risks and vulnerabilities in the European Union shadow banking system as following:

- Liquidity risk and risks associated with leverage among some types of investment funds (e.g. those which invest in less liquid markets while offering daily redeemable shares or which are highly leveraged);
- interconnectedness and contagion risk across sectors and within the shadow banking system, including domestic and cross-border linkages;
- periodicity, leverage, and liquidity risk created through the use of derivatives and securities financing transactions;
- vulnerabilities in some parts of the other financial institutions sector, where significant data gaps prevent a definitive risk assessment.

3.2.3 Risk of shadow banking system in European Union

Systemic risk has been defined by Hsu (2013) as the risk that an event will trigger a loss of economic value or confidence in, and attendant increases in uncertainty about, a substantial portion of the financial system that is serious enough to quite probably have significant adverse effects on the real economy. Commonly, there are two types of systemic risk which can be used to arise in European Union:

- Liquidity risk, Barnhill (2011) state that it can be used in some situations that many financial institutions run into a stone wall in rolling over their short-term debt or they could not use a normal bid spread or ask spread to trade assets;

- Solvency risk, which means that the financial institutions would face some unexpected losses no matter the source, type or size of the losses.

Hartmann (2000) states that the systemic risk usually happens because of the structure of bank balance sheets, the interconnectedness of financial institutions or the intertemporal nature of financial products. Thanks to current situation in European Union, which has been faced on both liquidity risk and solvency risk due to the causes which have been listed above: nature of balance sheets in European Union, the interconnectedness of financial institutions, and the maturity mismatches in financial contracts.

Therefore, we have easily seen that the systemic financial crisis in European Union is a real menace, especially it has been more important since there is European Union-wide expansion of European Union banks has been greatly encouraged. Herd effect, which accompanied with the highly dependent in the respect of banking sector which has participated in shadow banking activities and the decentralization of banking branches within the European Union, brings out the real menace to the financial stability. This is controversial in the context of complex financial regulation within the European Union.

European Union has already been systemically affected, there were one time of financial crisis around 2013 first entered European Union's financial system through the banks, which are highly connected with the European Union's industrial sector and they could influence the real economy which had been immediately threatened. Banks' exposure to subprime mortgages and aggressive expansion into overseas markets increased the risk of risky loans to Banks. Banks' exposure to subprime mortgages and aggressive expansion into overseas markets increased the risk of risky loans to Banks. Securitization of these risky loans have exacerbated the problem and have transferred the crisis on to Europe's shadow banking system.

The financial system itself could be used to divide into monetary, which is the money-issue institutions (MFIs) and other monetary financial institutions (non-MFIs). MFIs usually make up by credit institutions, money market funds and other MFIs, as the same time, the non-MFIs are usually constituted by the investment funds, financial vehicle corporations, insurance and pension funds, public financial corporations, hedge funds, and other non-MFIs, which include the financial leasing companies, securities lending corporations, and financial auxiliaries.

Credit agencies account for most of the financial sector, including Banks and other types of credit issuers. Banks are not part of the shadow banking system, but they have plenty of assets that are indeed part of the shadow banking sector and created uncertainty during the credit crisis. In times of crisis, Banks have lost confidence in their cross-border peers. The European Commission Green Paper (2012) found that in the case of difficult or severe uncertainty, the risks assumed by shadow Banks can be easily transferred to the banking industry through the following channels:

- Borrowing directly from the banking system and bank contingent liabilities (credit enhancement and liquidity lines);
- the bulk of the sale of assets affected financial and real estate prices.

As the crisis unfolded, both factors spread to the banking sector.

Hsu (2013) states that financial vehicle companies with close ties to European Banks have also been adversely affected. Financial vehicle companies are a kind of safety generator which was found throughout European Union, especially in Spain, Ireland, the Netherlands and Italy, but it lacks coordinated oversight. European financial vehicle companies' common shadow banking assets include asset-backed commercial paper (ABCP) and asset-backed securities (ABS), which themselves were used to form mortgage debt before the great recession. As the securities market has experienced huge losses, financial vehicle companies have suffered in turn.

Pozsar (2010) hedge funds have been affected also. They actually play a less important role in shadow banking sector in the European Union, but the hedge funds are deemed as part of asset management sector, they have contributed to credit transformation by selling credit default swap (CDS) betting with asset-backed securities (ABS) and collateralized debt obligations (CDOs). The two main channels that hedge funds can and have affected financial stability are through markets and credit channels.

When markets disrupt liquidity and pricing through market channels, credit channels suffer losses from counterparties, such as Banks and brokers that failed to hedge funds.

Simon (2012) states that although the investment fund, insurance and pension funds and public financial firms are not part of the shadow banking itself, but in these institutions and numerous interconnected, exists between the shadow banking assets of these institutions by the shadow banking sector and vice versa. This is because the European Union shadow banking system is tightly integrated with the financial system, and it is possible to have contagion effects by means of financial transmission such as interest rates and other aspects of the industry. Shadow banking sends financial pressure to the regulated banking sector. Credit agencies such as banks have done a lot of business with financial vehicle companies and other counterparties.

Further, systemic risk is created through long, complex, opaque mediations within and between the shadow banking system and traditional banking systems. The use of collateral swaps to provide securities with lower collateral for high-quality securities, such as lending government bonds against asset-backed securities (ABS), which is a good example. Use borrowed securities, banks can obtain the repo financing, which can hold the repo financing to meet the liquidity requirements of regulators to perform, or in additional transactions using again, to make the longer chains. Another example is the source of borrowing by hedge funds.

3.2.4 Components of shadow banking in EU

The activities associated with shadow banking include credit transformation and liquidity and maturity transformation. In order to better understand the importance of shadow banking in EU and asses the statistical data available, it is necessary to translate the activities into the identification of specific entities or market segments. The main components of shadow banking consist of entities involved in securitization (e.g., special vehicles and financial intermediaries), the repo markets, money market funds (MMFs), and hedge funds.

Securitization activities

There are many segments of shadow banking, from the loan origination to the wholesale funding, are involved in securitization activities, which allows the breakdown of the credit intermediation and the increase of both the maturity transformation and the liquidity transformation. Tab. 3.3 below summarizes the main features of securitization.

Tab. 3.3 Main features of securitization

Activity	Funding	Entity
Asset Backed Security origination/Asset Backed Security warehousing	Asset Backed Commercial Paper (ABCP)	Conduits
	Asset Backed Securities (ABS)	Special Purpose Vehicles (SPV)
	Repo	Broker - dealers
Asset Backed Security issuance/Collateralized Debt Obligation (CDO) issuance	Commercial paper (CP)	Special Purpose Vehicles (SPV)
	Collateralized Debt Obligation (CDO)	Broker - dealers
Asset Backed Security Intermediation	Asset Backed Commercial Paper (ABCP)	Structured Investment Vehicles
	Medium Term Note (MTN)	Conduits
	Capital notes	Hedge funds
	Repo	
Wholesale Funding	Repo	Securities lenders
	Asset Backed Commercial Paper (ABCP)	Cash funds
		Money Market Funds (MMF)

Source: Pozsar et al., (2010),

Unlike the situation in the United States and the United Kingdom, the lending activity is seldom move outside the well-regulated financial system and the original lender is allowed to sell the claims to another entity no matter whether it is regulated or not in EU. Besides, both asset backed commercial paper (ABCP) and asset backed securities (ABSs) are the most important forms of securitization in EU and over half of securitized products are residential mortgage backed securities (RMBSs).

Money market funds

Money market funds (MMFs) are created to act as an alternative to bank deposits on bank interest rate to the regulatory caps. They are an important source of funding for shadow banking by buying certificates of deposits (CDs) and commercial paper (CP) and by repo transactions when investing in short-term debt. The institutional investors are the main investor group and the regulations governing the investment strategy of MMFs vary from country to country. There is a powerful link between the shadow banking sector and the regulated banking sector because the European MMFs are closely related to the regulated banks.

The repo markets

Repos are associated with an agreement between a cash borrower (or repo seller) and a cash lender (or repo buyer) on the temporary sale of assets for a specified amount of cash and period of time with repo rate paid over the duration of the cash holding by the cash borrower to the cash lender. Usually, the repos imply the better protection for the cash lender in the case that the cash borrower defaults, which makes them important fund-raising financial instruments similar as the unsecured loans and the issuance of short-term securities.

Distinguished by the different underlying assets, there are two types of repos, namely the general collateral repos and the special repos. In general collateral repos, the collateral is a security chosen among a big amount of securities and the motivation is the funding or the liquidity needs of the cash lender; while the special repos focus on a specific asset demanded as collateral without the purposes of funding or liquidity needs. During the period of financial crisis, the share of the general collateral repos increased more compared with the share of the special repos, which means there are some replacements of the funding activities in the unsecured money markets.

Hedge funds

Hedge funds are alternative investments by using a pool of funds to earn positive returns for the investors through a larger number of different strategies. Simon (2012) states that the according to the data which are available at the European Union Central Bank, the hedge funds in euro area generally are appearing to acquire a limited role. However, whether the hedge funds are component of shadow banking system in European Union is still debatable, nevertheless the hedge funds are part of the complex network of financial intermediary, the financial intermediary played an important role on the development of the shadow banking, whether through securitization activities or repo market. So-called credit hedge funds are at least partially involved since their strategies are included, for instance, investing in decentralized over-the-counter securities, and looking for potential arbitrage opportunities for CDOs mispricing.

Fig 3.3 Engagement of types of entities in shadow banking activities in EU

Source: European systemic risk board 2017

From Fig 3.3, which shows that the color of the circle reflects the strength of the participating institutions in the related field of activity according to the code specified in the comments above.

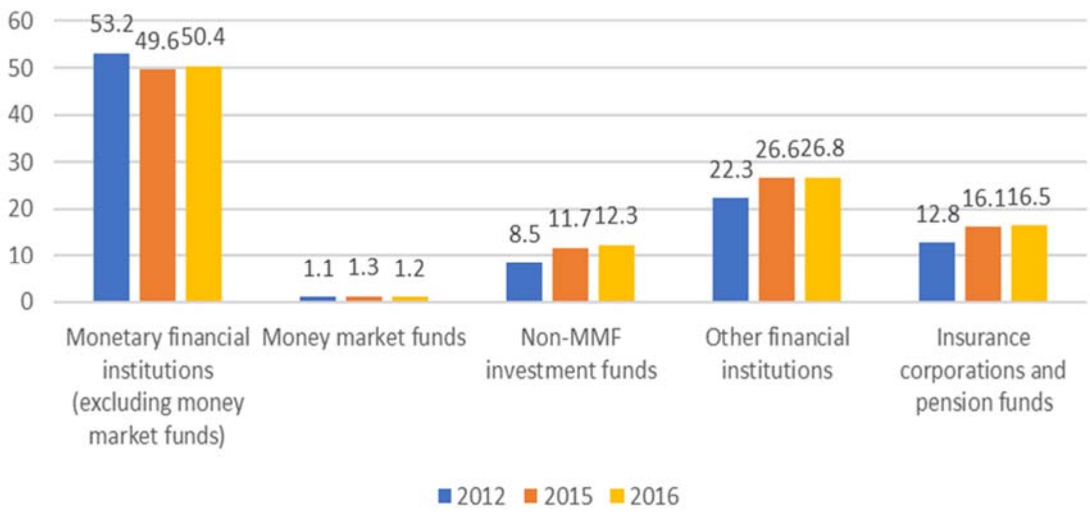
4 Potential risk and regulation of the European and Chinese shadow banking system

As we all know that the shadow banking system is not yet mature, of course there are a lot of potential risks in both China and Europe. Meanwhile, both Chinese government and European Union government are trying to do their best to regulate the shadow banking system to reduce the potential risks which would affect their financial system. The goal of analysis in this chapter would be what extent of potential risks and regulations in Chinese and European Union shadow banking system, which would be mainly focused on the variety and size of shadow banking business.

4.1 Potential risk and regulation of the European shadow banking system

ESRB (2016) states that in recent years, the shadow banking has expanded greatly in Europe, the broad shadow banking system accounted approximately 38% of the total assets of the European Union financial sector and 272% of European Union gross domestic product (GDP) at the end of fourth quarter of 2016, which can be summarized as Fig 4.1 in the following:

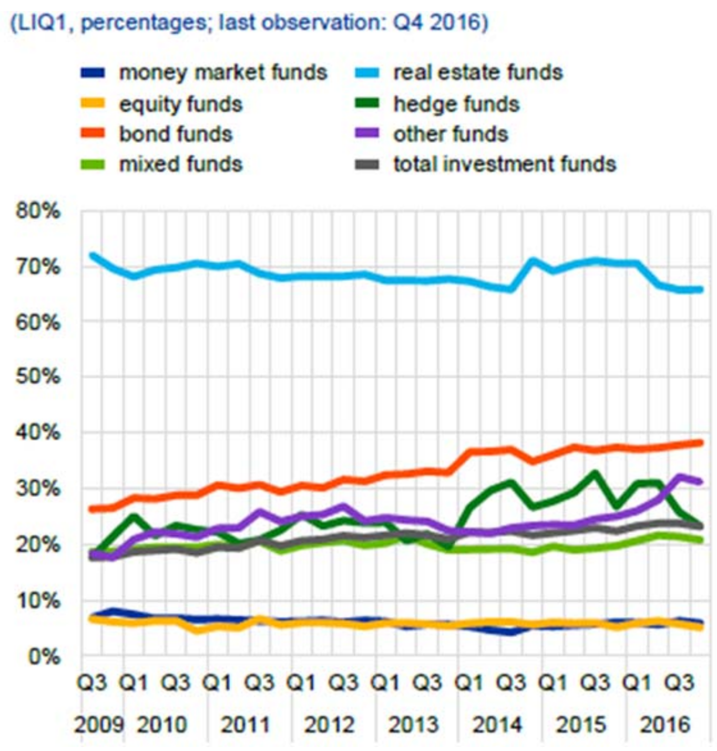
Fig 4.1 European Union financial sector (trillion euro)



Sources: Author's calculations based on data from European central bank (2017).

The rapid growth of the non-bank financial sector highlights the need for a monitoring framework to capture the risks posed by shadow banking entities and activities. Although it provides a diversified source of funding for the real economy, non-bank financial institutions may pose similar risks to Banks. For example, non-bank financial institutions may use leverage that may cause risk amplification throughout the financial system while conducting credit intermediation. Even if usage of leverage is limited, the liquidity and maturity shifts of the non-bank financial sector can be risky. Therefore, non-bank financial institutions to the rise of financial intermediation requires close monitoring, so that the authorities can find and evaluate the sources of systemic risk, and take the appropriate policies and measures to mitigate these risks.

Fig 4.2 EU investment funds: liquidity transformation[5]



Source: European central bank (ECB) 2017.

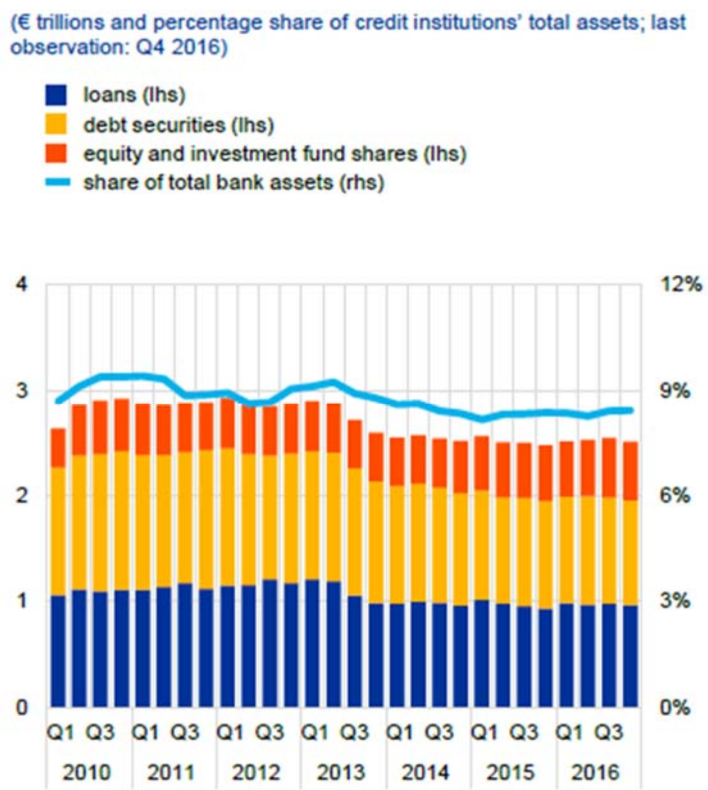
For investment funds, which is one type of shadow banking business, the liquidity and maturity transformation of investment funds, if poorly managed, can create

[5] Liquidity transformation expressed as total assets minus liquid assets.

first-mover advantage, leading to liquidity consumption and sales pressure during the period of pressure. As a result, the European Union fast-growing investment fund needs to closely monitor its activities and assess its role in promoting the impact of financial markets. A criterion measure of open bond fund liquidity illiquid assets accounted for the proportion of total assets, according to the Fig 4.2, in the past seven years in the illiquid assets accounted for from 30% to nearly 30%.

The risk of financial stability may be increased by direct or indirect exposures and ownership connections between credit institutions and shadow banking entities. Shadow banking entities can form part of a complex financial intermediation chain that can cross national boundaries and across different sectors of the financial system. As the global financial crisis has shown, the lack of information and transparency about these linkages could pose a challenge to systemic risk monitoring when entities are located in different jurisdictions.

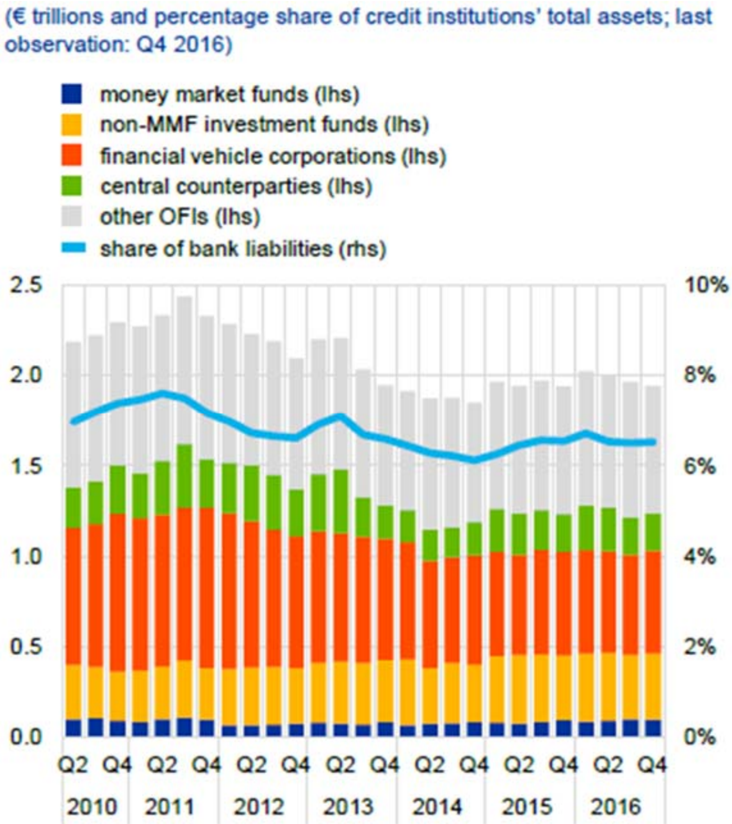
Fig 4.3 Euro area credit institutions' assets



Source: ECB 2017.

There is a significant interconnection between credit institutions and entities with broad shadow banking operations. According to Fig 4.3, there are more than 8% of euro area credit institutions' assets are linked to euro area investment funds and other financial institutions through loans, debt securities and equity or investment fund shares. In addition, 7% of euro area credit institutions' liabilities are deposits from euro area investment funds and other financial institutions, which can be shown as Fig 4.4 in the following:

Fig 4.4 Euro area credit institutions' deposits sources

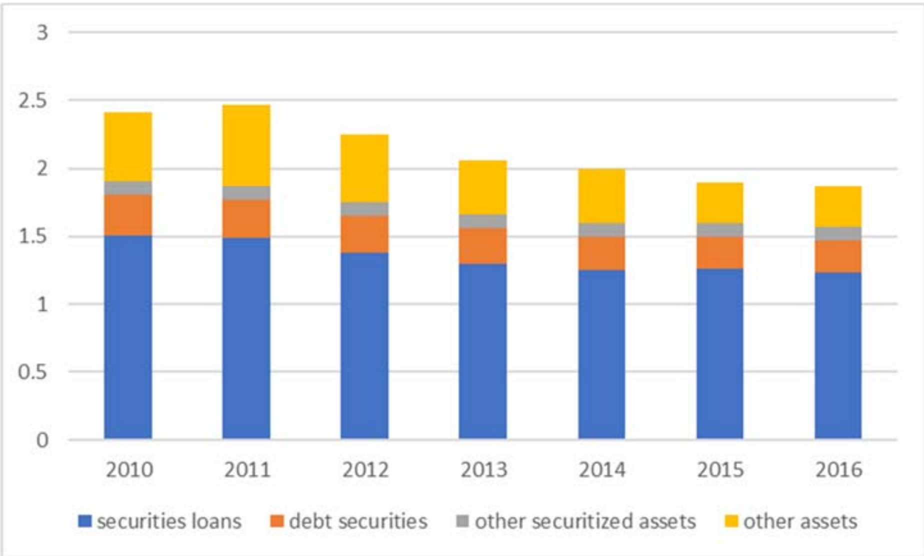


Source: ECB 2017.

4.1.1 Financial vehicle corporations

Financial vehicle corporations engaged in the securitization business are subsets of specialized vehicles committed to the transfer of credit risk, converting non-current assets into more liquid debt securities. In some cases, the transfer of credit risk is achieved through derivatives. Concern about the risk of shadow banking in financial vehicle corporations (FVCs) are related to credit intermediation, especially with banking sector. Banks and non-bank financial institutions may rely on securitization for financing and promote off-balance-sheet credit risk transfer. European systemic risk board (2017) indicates that while securitization can reduce the cost of financing and facilitate loans to the real economy, it could also lead to systemic over-leveraging and reduce lending standards. The ownership of equity in FVC is usually negligible, resulting in high leverage at the entity level.

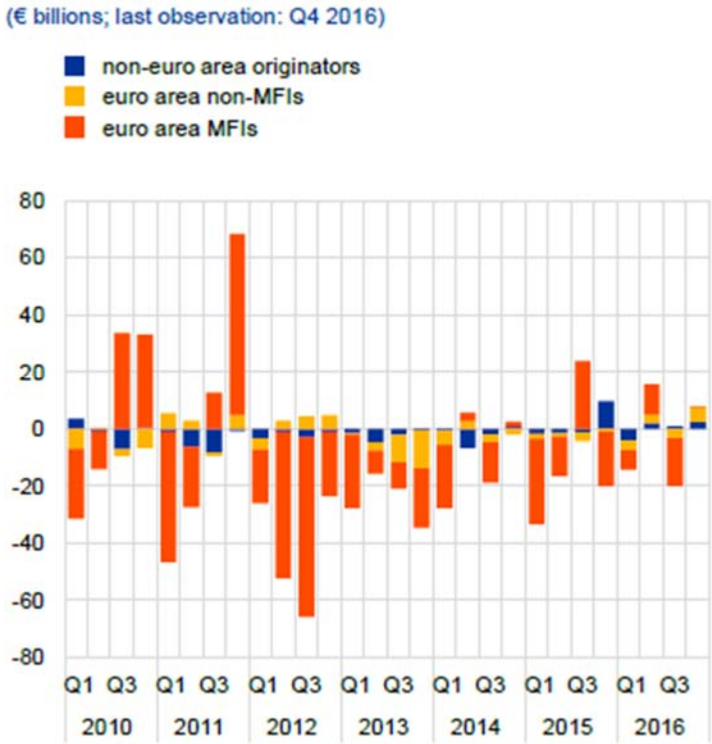
Fig 4.5 Euro area FVCs' assets (trillion euro)



Sources: Author's calculations based on data from ECB 2017.

From Fig 4.5, we can easily conclude that at the end of the fourth quarter of 2016, euro area FVCs' total assets reached 1.8 trillion euros. In the long term, the total assets of FVCs in the euro area fell by 24% between 2010 and the fourth quarter of 2016, including a decline in the credit cycle after the financial crisis. With regard to asset portfolio, by the end of 2016, securitization loans amounted to 1.2 trillion euros, accounting for 66 percent of total assets.

Fig 4.6 Loans securitized by euro area FVCs

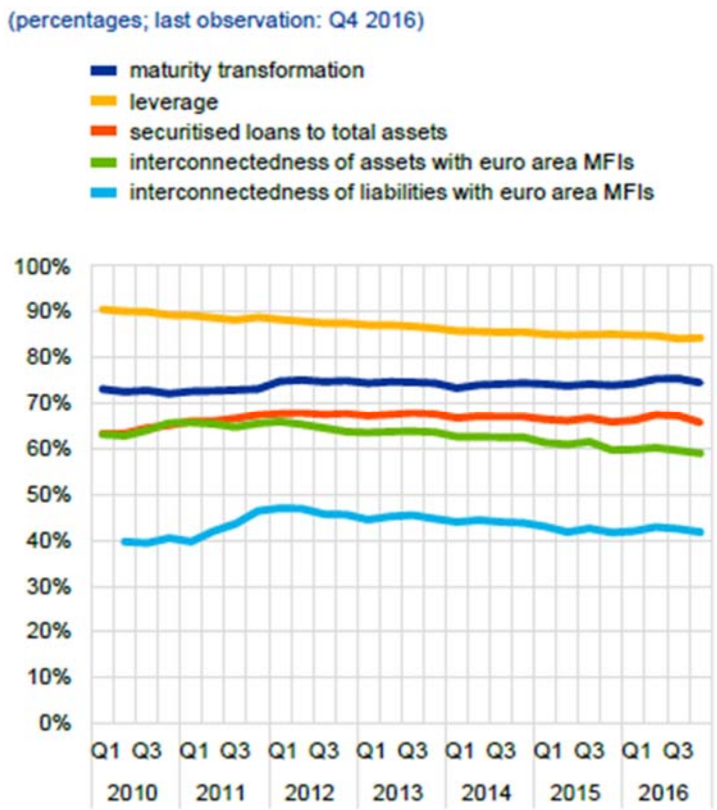


Source: ECB 2017.

From Fig 4.6, we can analyze that from the point of absolute value, between 2010 to 2015 the average transactions compared with the average level in 2016, in the same time, the securitized loans related to euro area non-MFIs decreased from 69% to 46%, meanwhile, the securitized loans related to euro area non-MFIs increased from 11% to 21%. European systemic risk board (2017) indicates that in terms of debt, outstanding debt issued by the euro zone's FVC fell from 2.0 trillion euros in the first quarter of 2010 to 1.4 trillion euros in the fourth quarter of 2016.

European system of financial supervision (2017) indicates that *maturity transformation is not a significant feature of FVCs, although it represents the main risk.* For instance, even a few FVCS have a maturity mismatch, causing securitized bond investors to receive no payment at maturity, but the functioning of a very liquid securitized bond market may be disrupted. As proved during the crisis, this maturity transformation of FVCs credit intermediation can be a risk to financial stability. In general, the maturity transformation of the euro area's FVCs does not imply broad industry risk and has remained relatively stable over the past few years. The risk of MFI holding up to FVC's maturity transformation was 74% in the fourth quarter of 2016 and has remained largely unchanged in recent years, which can be expressed as Fig 4.7 in the following:

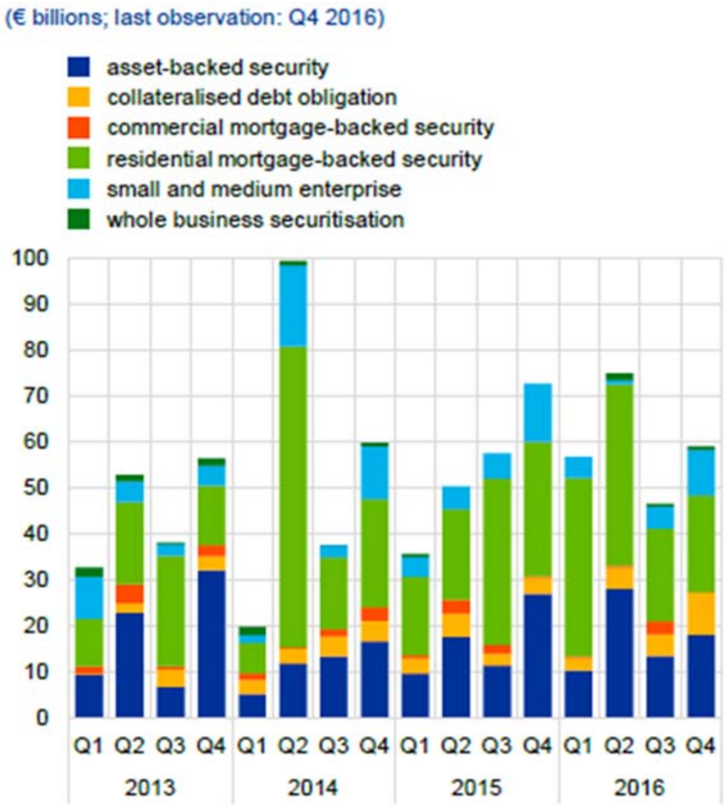
Fig 4.7 Euro area FVCs' maturity transformation



Source: ECB 2017.

Also, from Fig 4.7, we can find out that in relation to the euro area banking system, 59% of the euro area's FVC assets are linked to the euro area's MFIs. In terms of liabilities, 42% of the euro zone's FVC is linked to the MFIs in the euro area, mainly because the number of securitizes that are kept allows banks to access the central bank's liquidity facilities. Moreover, securitization has experienced a degree of change in mortgage security. For example, the average ratio of RMBS securitization was 56% from 2010 to 2015, and the average level was 50% in 2016, while ABS securitization increased from 21% to 30%, which can be expressed as Fig 4.8 in the following:

Fig 4.8 European securitization issuance by collateral



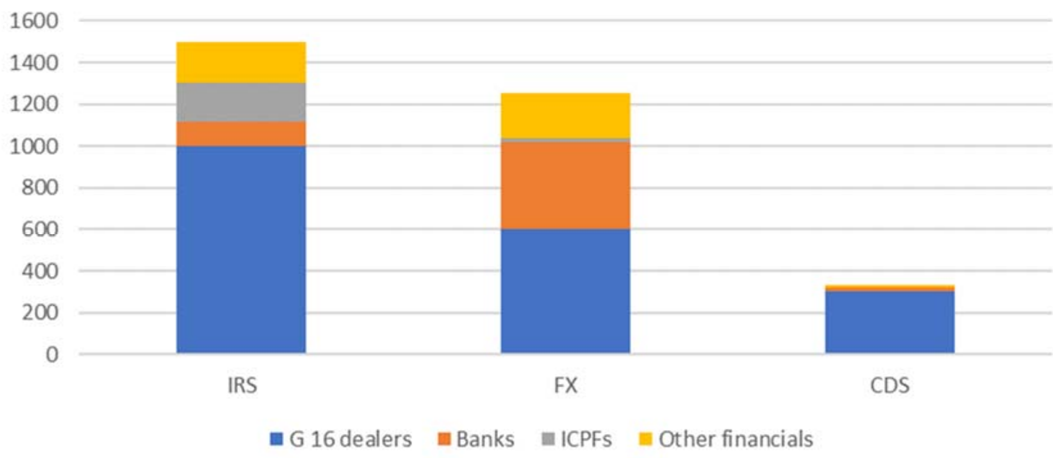
Source: Association for financial markets in Europe 2017.

4.1.2 Derivatives

Derivatives trading involves various non-bank financial institutions. The risk associated with the shadow banking in the market, use derivatives to establish synthetic lever increased exposure to the entity, and may pose a threat to financial stability through a variety of channels. As a risk transfer tool, for example, derivatives significantly increase the interconnectedness between shadow banking entities and the banking sector and the shadow banking system. In addition to the risks and vulnerabilities associated with interconnectivity, counterparty risk, credit risk and pro-cyclical behavior can be used as further risk transmission channels in the derivatives market.

The correlation and contact of "other finance" in the derivatives market need to be closely monitored. In addition, non-bank financial institutions have a significant portion of these markets unfinished business. In general, interest rate swaps (IRS) are widely used as hedging instruments between Banks and other intermediaries, but may make individuals sensitive to interest rate changes. The credit derivatives market, in particular the credit default swap market (CDS), transfers counterparties and basic credit risks. Foreign exchange (FX) derivatives markets, on the other hand, allow financial and non-financial counterparty unnecessary exchange risk hedge, and between the financial system and real economy more closely linked than other forms of derivatives. Due to the topological features of the interest rate swap (IRS) and credit default swaps (CDS) networks, most counterparties trade with 16 of the largest dealer communities, known as G16. Fig 4.9 shows that these other financial institutions are involved in the derivatives trades of heterogeneous trading partners in the IRS and foreign exchange markets, and they mainly trade with G16 dealers in the CDS market:

Fig 4.9 EU derivatives markets in 2017(billion euro)



Source: Author's calculations based on data from European systemic risk board 2017.

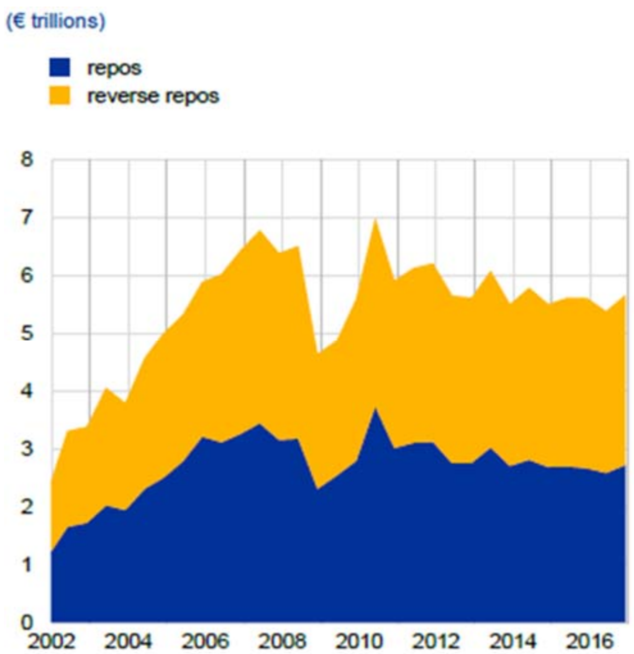
In addition to establishing links between banks and non-bank financial institutions, derivatives can also be used to influence exposure. However, further evaluation of shadow banking entities involved in derivative transactions is hampered by the lack of detailed information on the types of non-bank financial institutions.

Similar to other forms of leverage, this could increase the pro-cyclicality of the financial system. Although synthetic leverage can play an important role in the derivatives market, further analysis is needed to assess and measure the risks arising from such leverage.

4.1.3 Securities financing transactions

Securities financing transactions (SFTs), including repos, securities lending and margin loans, helped create the risk of a shadow banking system. SFT promote credit growth and maturity outside the banking system and liquidity transformation, and not only to the leverage, the demand and supply for certain securities also has pro-cyclical effect, for example, those who are seeking as collateral. If you invest in longer-dated securities, reinvestment in cash collateral may involve liquidity and term conversion. In addition, non-cash collateral is often reused, creating an opaque chain of collateral within and within the department.

Fig 4.10 Size of the EU repo market in 2017

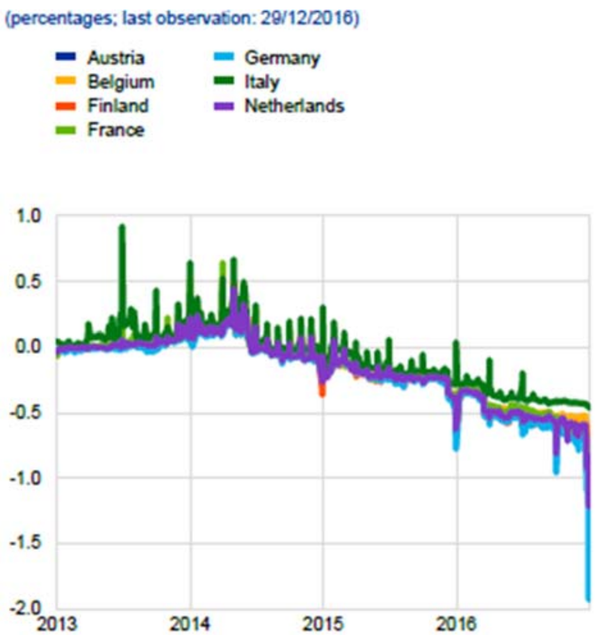


Source: ICMA and European securities and market authority (ESMA) 2017.

The repo market has reduced the financial sector, which is part of the mortgage transition chain that is not sold in cash for future repurchases. From Fig 4.10, we can see that the international capital market association (ICMA), an industry association, estimates that the EU repo market's nominal total outstanding contracts at the end of 2016 about 5.7 trillion euros, roughly unchanged from the previous year and well below the 2010 peak.

Repos are usually short-term instruments, and lenders and borrowers can easily decide to leave the market in a short time. According to ICMA, in June 2016, 51% of repurchase contracts mature in less than a week, and 30% of the maturity is one week to three months. Several countries' sovereign repurchase rates fell in 2016, reflecting comparable growth in the cost of securities lending. The usual year-end volatility could be reinforced by new expectations of monetary policy and fears of a shortage of high-quality collateral in the euro area, which can be expressed as Fig 4.11 in the following:

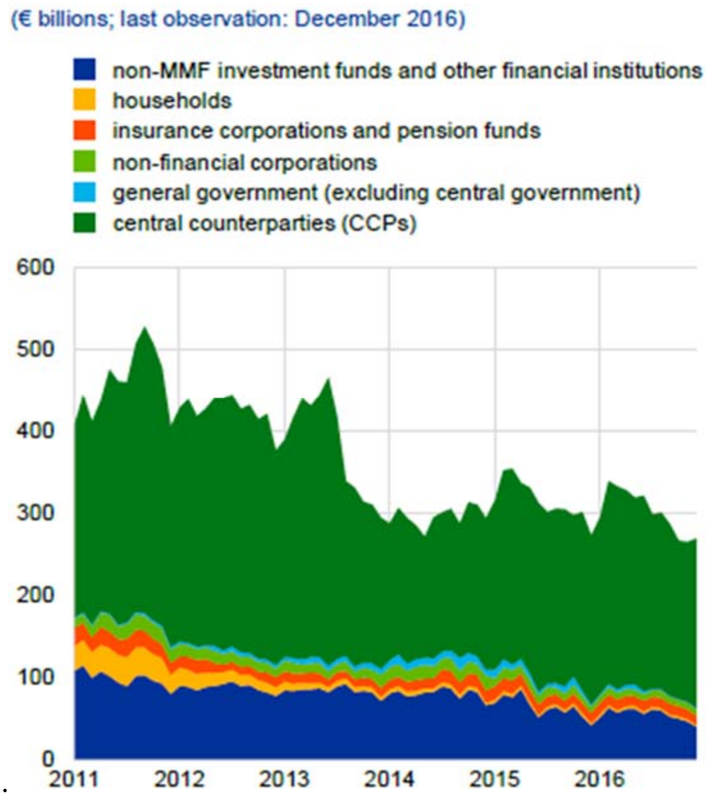
Fig 4.11 Repo rate on selected sovereigns



Source: Repo funds rates and ESMA 2017.

The repo responsibility of MFIs contributes to the interlinkages within the financial system. By the end of 2016, non-microfinance institutions had about 270 billion euros in repo debt, in the medium term, the amount outstanding has fallen from about 400 billion euros in 2012, according to the Fig 4.12 in the following:

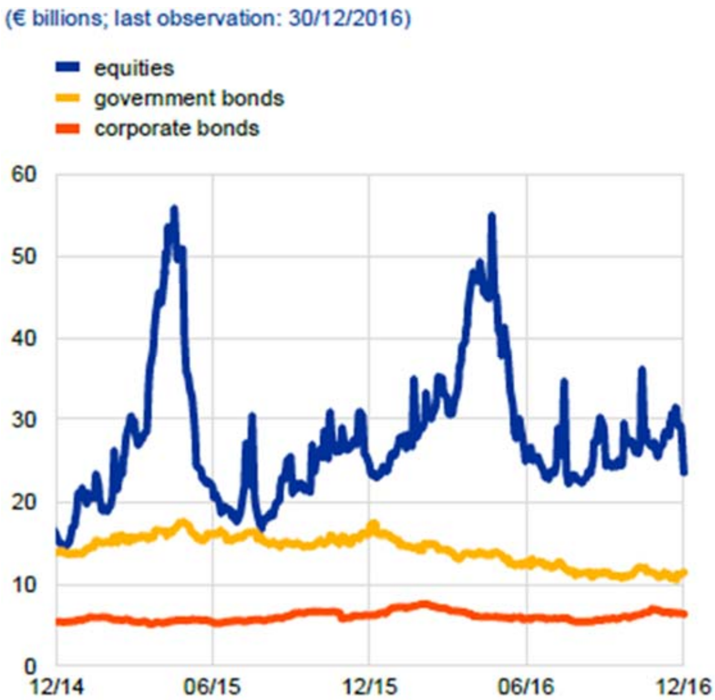
Fig 4.12 Euro area MFIs' repo liabilities with non-MFIs



Source: European Central Bank 2017.

Open maturity transactions in SFT markets usually are more risk than term maturity transactions. In times of economic stress, lenders may withdraw securities that are lent on the maturity date, and borrowers may not be able to return them in a short period of time. The liquidity conversion occurs when cash collateral is received during the open period and reinvested when the maturity is due. Finally, securities lending activities help to increase the interconnectedness of the financial system. Especially at the end of the fourth quarter of 2016, involves the equity, government bonds and corporate bonds beneficially owned human investment fund securities lending transactions, respectively for 24 billion euros, 11 billion euros and 6.3 billion euros. The number of government bonds has fallen by nearly 6 billion euros compared with a year ago, which can be expressed as Fig 4.13 in the following:

Fig 4.13 Outstanding value of EU securities on loan owned by investment funds



Source: Markit Ltd. and ESMA 2017.

European Systemic Risk Board indicates that from 2018, the new regulatory data collected under securities financing transaction regulation (SFTR) will provide a more granular mapping of the securities financing transaction (SFT) market.[6] According to the regulation, all market participants must report the SFT detailed information, including the composition of the collateral, whether collateral can reuse and has been repeated use, at the end of the day instead of collateral and applicable deductions.

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[6] Regulation (EU) No 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012.

4.2 Potential risk and regulation in Chinese shadow banking system

The broadly defined shadow banking business has stalled in China in the first half of 2017 amid continued regulatory clampdown. In the first six months of 2017, total shadow banking assets barely grew, falling as a percentage of GDP for the first time since 2012.

The slowdown in economic growth was due to a fall in the number of high-risk tools, for instance, the wealth management products (WMPs) issued by banks and asset management plans channeled through non-banking financial institutions (NBFIs) regulated by China Securities Regulatory Commission (CSRC). Interbank investors hold share of the wealth management products have begun to shrink, bank claims of non-bank financial institutions are declining, which suggests that recent measures are to reduce the financial system of interconnected, and solve the increasingly complex and opaque financing chain caused by the financial system vulnerability. This suggests that regulatory measures may have some effect in stimulating the deleveraging of the financial sector.

However, credit demand for the real economy remains strong, as is the continued expansion of core shadow Banks, in addition to bank loans and corporate bond issuance. Included in the total social financing (TSF) in the "core" shadow banking business continued to show signs of strong growth, trust and entrusted loans are growth, not discount the bankers' acceptances of expansion for the first time in three years.

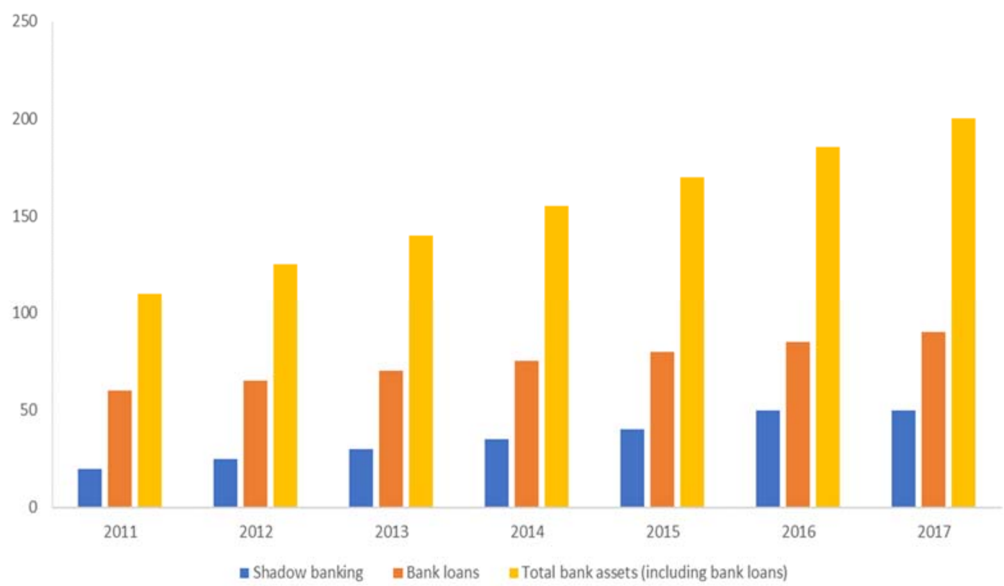
The people's Bank of China is boosting the decreasing of risk in the financial sector by expanding its liquidity supply. Although yields have risen, but in September the new issue of the interbank negotiable certificates of deposit (NCD) hit a record high, indicating that some small and medium-sized Banks facing the double pressure. Because of the people's Bank of China "modest and neutral" monetary policy stance and the Banks' ability to obtain financing has been decreased through the shadow banking channels, market liquidity tightening, the people's Bank of China through long-term repo increased liquidity supply, in order to make Banks more time to give up their portfolios. Small and medium-sized Banks, in particular, have reduced their reliance on wholesale funding and are increasingly reliant on central-bank funding.

The challenges associated with tighter regulation and widespread deleveraging remain. After the 19th national congress of the Chinese communist party, financial sector regulation may continue to suppress the growth of shadow banking, and solve some of the key imbalances in the financial system. But the authorities still face the challenge of reducing the risk of systemic damage from the financial sector. In addition to these challenges, some shadow banking products are opaque, and regulatory measures often end up encouraging financial innovation to circumvent tighter regulation. In addition, the ability of the formal system to replace shadow credit is limited, and bank credit may not be the perfect substitute for shadow credit.

4.2.1 Credit conditions

The broad shadow banking assets defined in Fig 4.14 barely increased in the first six months to 64.7 trillion yuan, compared with 64.4 trillion yuan at the end of 2016.

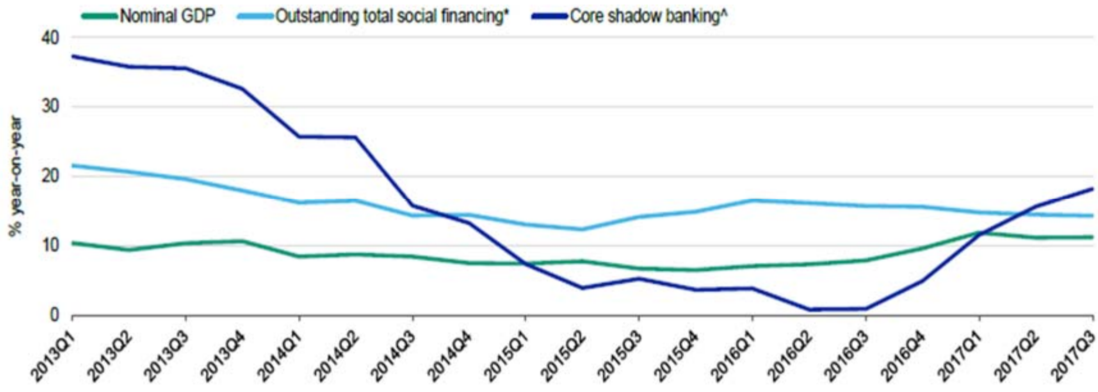
Fig 4.14 Size of banks and shadow banking business in China (trillion RMB)



Source: Author’s calculations based on data from Moody’s 2017.

From Fig 4.14, we can conclude that for the first time since 2012, nominal gross domestic product (GDP) growth rate more than shadow banking assets, resulting in a decline in the shadow banking business in June 2017 to 82.6% of GDP, and the peak value of the end of 2016 to 86.5% in 2016. The slowdown was largely due to a fall in the balance of bank WMPs and NBFIs' asset management plans, some of which were not available in TSF but have been the focus of recent regulatory measures.

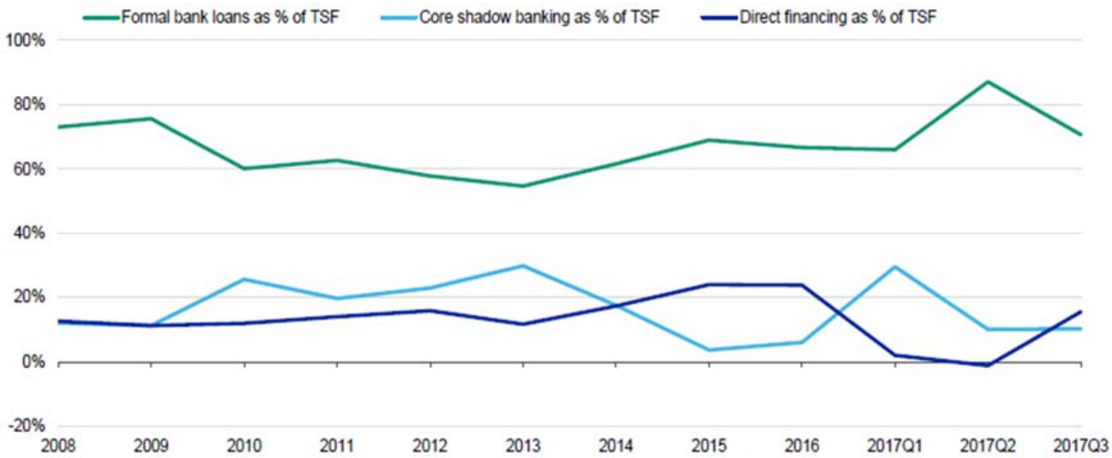
Fig 4.15 Size of core shadow banking



Source: Moody's 2017.

From Fig 4.15, we can conclude that the strength of the "core" shadow banking sector has partially offset the decline in wealth management products. Tighter regulatory scrutiny of the shadow banking component was not available in TSF, leading to a drop in its high growth rate. However, the expansion of the "core" shadow banking business, including entrusted loans, trust loans and undiscounted bank acceptance bills, has continued to accelerate. As a result, the share of core shadow Banks in the broad shadow banking sector has increased slightly. Although overall credit growth fell in the third quarter of 2017, while nominal GDP growth remained stable, overall leverage continued to rise.

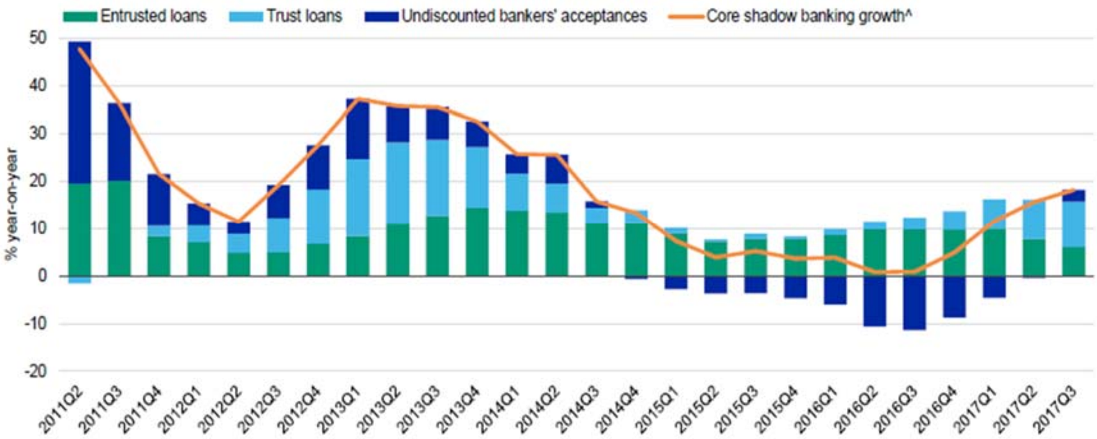
Fig 4.16 Comparison of core shadow banking and total social financing



Source: Moody's 2017.

From Fig 4.16, we can get some information that formal bank lending is still the main driver of the new TSF flows and corporate bond financing has risen. In the new TSF flow, the official bank loan has dropped in the third quarter of 2017, but is still above 2008, for most of the last decade. Corporate bond financing has rallied strongly after the low issuance in the past two months, prompting TSF to raise its total share of direct financing to its highest level in 2017.

Fig 4.17 Type of core shadow banking business

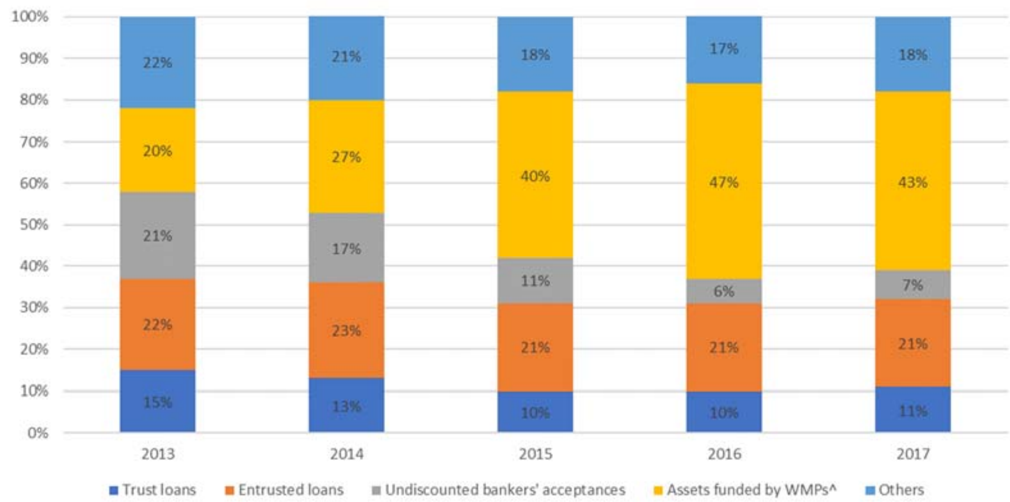


Source: Moody's 2017.

From Fig 4.17 above, we know that core shadow banking activities accelerated further. By the end of the third quarter of 2017, the growth in core shadow banking business grew to 18.2% from a year earlier, and has continued to rebound since the fourth quarter of 2016. For the first time, the contribution of undiscounted bank acceptance has returned to positive territory for the past three years. Some of the relatively good regulation of credit supply to the shadow banking sector, such as credit companies, has increased transparency and could increase the system's ability to cope with unexpected shocks. Regulators, however, stress that trust is increasingly risky for borrowers' property and industries with excess capacity.

Since the second half of 2016, regulators have paid more and more attention to WMP, and WMP has been a significant growth point for the rapid growth of the banking industry. The strengthening of regulation involves the inclusion of Banks' off-balance-sheet WMP operations in the macro-prudential assessment (MPA) framework of the People's Bank of China, and imposes tighter restrictions on transactions between Banks and non-bank financial institutions. As of June 2017, these measures have led to a decline in WMP - funded assets from 43% of total shadow banking assets to 47% by the end of 2016. By contrast, core shadow Banks, including entrusted loans, trust loans and undiscounted bank acceptance bills have increased slightly over the same period, which can be expressed as Fig 4.18 in the following:

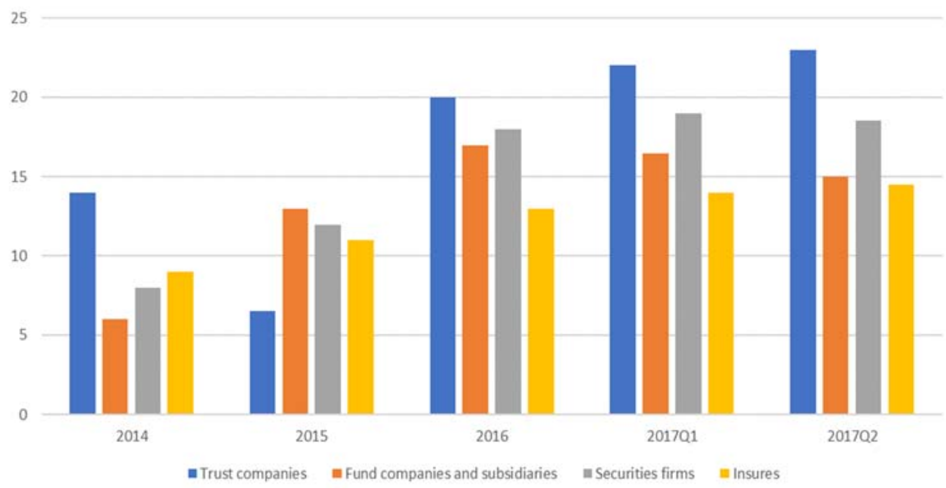
Fig 4.18 Regulatory crackdown produces results (as % of total shadow banking assets)



Source: Author’s calculations based on data from Moody’s 2017.

Tougher rules will also slow asset management. MFIs, which is regulated by the CSRC, which have passed strict asset management rules that led to three consecutive quarters of declines in assets under management by fund companies and their subsidiaries. Assets managed by securities firms also shrank in the second quarter of 2017. The broad asset management industry will remain the focus of the newly established committee on financial stability and development. In addition, the People's Bank of China proposed a comprehensive regulatory framework for asset management in February 2017[7]. If implemented, Banks would have a positive impact on credit, as it would improve regulators' ability to manage growth in shadow banking and reduce the scope of regulatory arbitrage, which can be expressed as Fig 4.19 in the following:

Fig 4.19 Asset management business (trillion RMB)

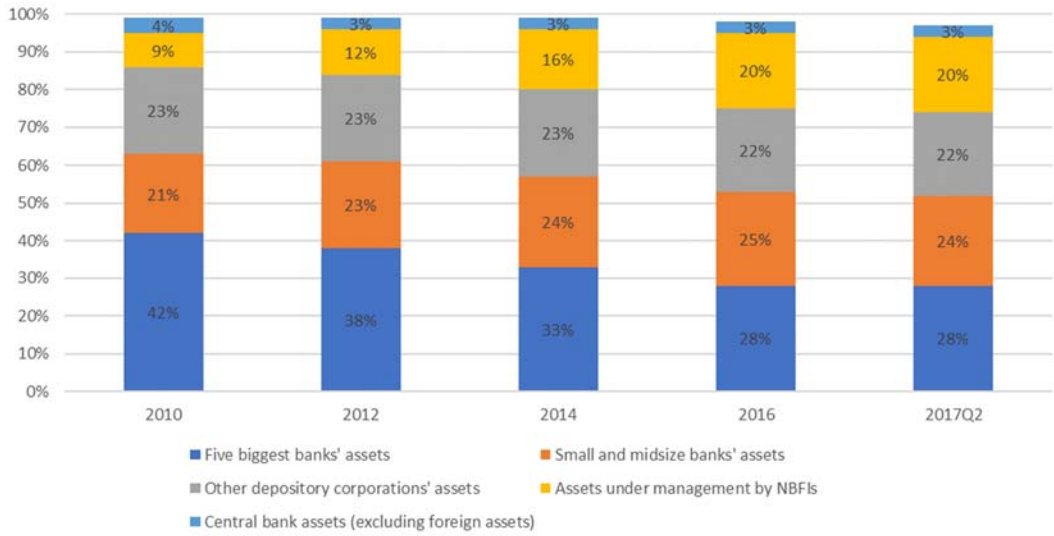


Source: Author's calculations based on data from Asset management association of China.

The share of big Banks in the financial system has stabilized. In the first half of 2017, the share of the big state-owned Banks in the financial system's assets, after a sharp decline in the previous year, remained stable from 2016, according to Fig 4.20 in the following:

[7] News from finance.sina.cn.

Fig 4.20 Financial sector asset composition



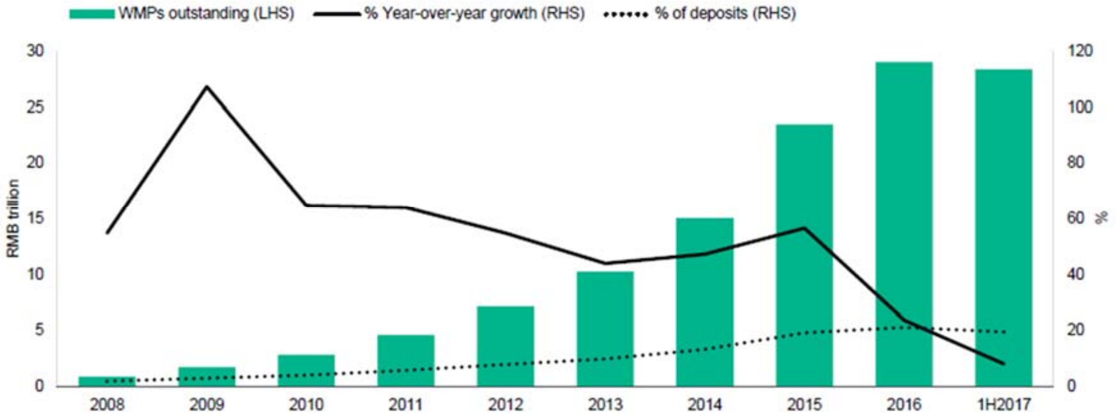
Source: Author's calculations based on data from Moody's 2017.

The main influencing factors are: adjustment of asset growth and the reduction of the balance of financial products issued by joint-stock Banks, followed by the gradual reduction of assets under management by securities companies and fund subsidiaries. Because of the multilayer credit transactions between Banks and non-bank financial institutions, these factors of the financial system have the stable financing structure and transparency is low, so slightly reduce risks around the financial system. Nevertheless, the share of the overall asset management business of non-bank financial institutions has more than doubled since the beginning of the decade.

4.2.2 Wealth management products

Enhanced regulatory measures have dampened the growth of WMPS off-balance sheet. As of June 2017, the balance of wealth management products issued or allocated by Banks has fallen from 29.1 trillion yuan at the end of 2016 to rmb28.4 trillion, equivalent to 19.5% of bank deposits, which would be shown as Fig 4.21 in the following:

Fig 4.21 Growth of off-balance sheet WMPs

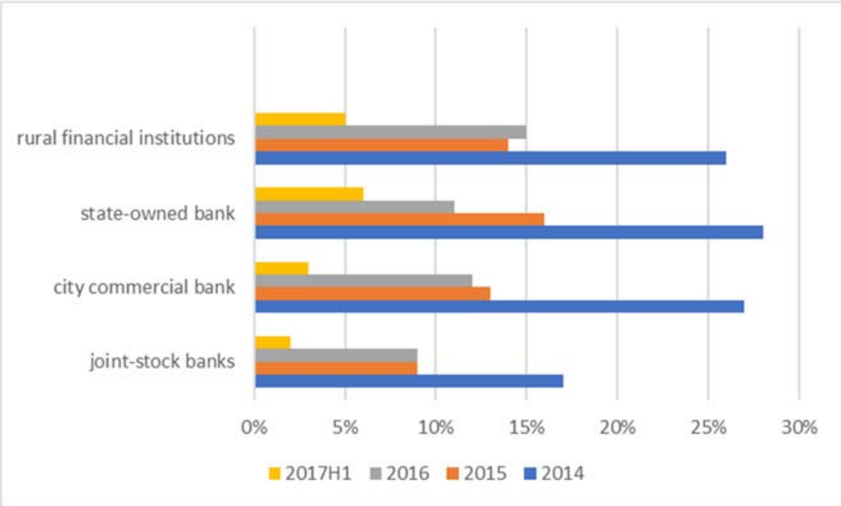


Source: China Banking Association 2017.

As presented above Fig 4.21, which shows that the implied year-on-year growth rate was 8.0%, compared with 23.6% in 2016 and 56.5% in 2015. According to the CBRC, the growth rate of uncompleted WMPs fell to 4.0% as of the end of September. The decrease in WMP's outstanding balance is a positive credit. It inhibits the incentive for banks to participate in regulatory arbitrage and reduces the vulnerability of the financial system.

The impact of tighter regulation on joint-stock banks is greatest. Although all commercial Banks report in the first half of 2017 outstanding balance of wealth management products, but the influence of the small and medium-sized banks, the biggest because they show that largest rise in off-balance-sheet financial product growth rate in the past. Joint-stock banks also led to a decline in the proportion of outstanding wealth management products relative to their assets, followed by urban commercial banks as presented below:

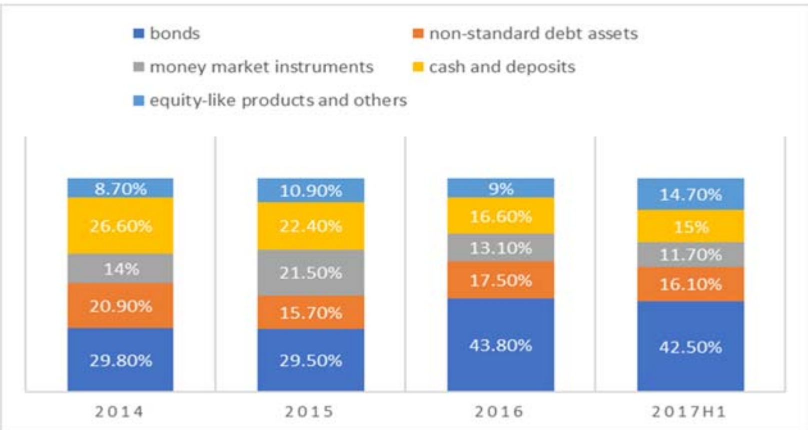
Fig 4.22 Changing WMPs of banks in China (outstanding WMPs as % of total assets)



Source: Author's calculations based on data from Wind Information Ltd.

Bonds, mainly corporate bonds, remain the largest asset class for Banks to issue WMPs, although their share fell in the first six months of 2017. In general, the bond assets, including deposits, money market instruments and liquidity non-standard debt assets (NSDA) is less, while the share of similar products show up to 14.7% from 9.0% over the same period as shown below:

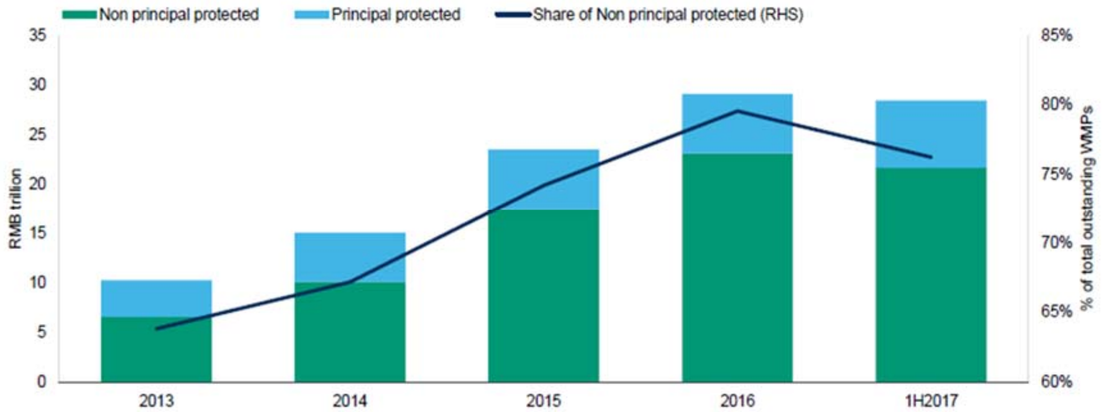
Fig 4.23 WMPs asset breakdown



Source: Author's calculations based on data from China Banking Association 2017.

A lack of public disclosure of exposure to the WMP investment industry has limited transparency about the investment or ultimate borrower. Multiple levels of credit trading also hinder transparency, and many WMP investments may have a higher single industry or borrower risk.

Fig 4.24 Balance of off-balance sheet WMPs



Source: Moody’s 2017.

From Fig 4.24, we could find out that off-balance-sheet WMPS pushed the balance down. The decrease in the performance of financial products is mainly driven by external appearance. These are not the main protected products, but often accompanied by implicit bank guarantees. By the end of June 2017, they accounted for 76% of the total outstanding WMPs, down from 80% at the end of 2016. By contrast, the share of the balance sheet WMPs has grown to an all-time high. The inclusion of the WMP business outside the bank table in the macro-prudential assessment MPA framework may explain this trend. It enhances the ability of regulators to monitor the rate of expansion of off-balance-sheet credit.

Fig 4.25 Maturity mismatch between WMPs and underlying assets eases

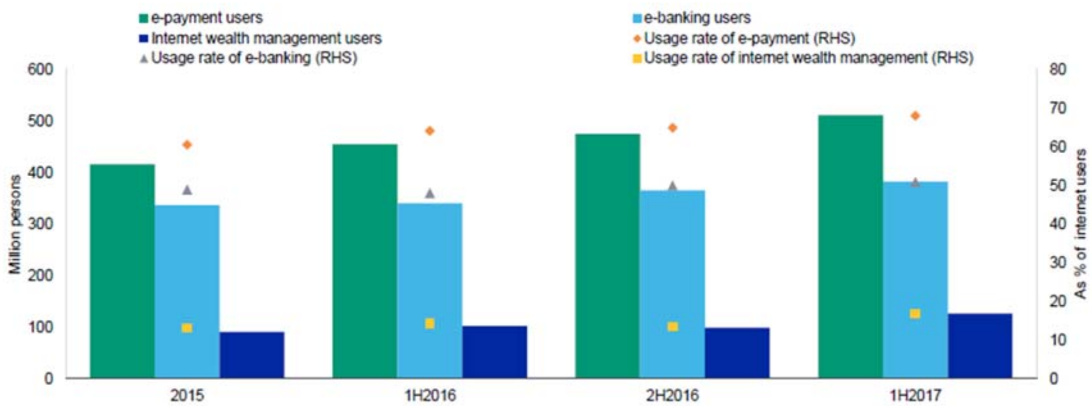
Source: Moody's 2017.

As presented above the Fig 4.25, we can conclude that the short term (1-3 months) WMP still dominates the newly released products, accounting for nearly 47% of the total, but its share has declined for four consecutive quarters. The proportion of newly issued WMPs from three to twelve months rose from 45% in the previous quarter to 46% in the third quarter of 2017.

4.2.3 E-finance

The share of e-financial users continues to grow recent years in China. The increase in internet use is a key driver of the development of China's financial technology industry. According to the China Internet Network Information Center (CNNIC), the total number of Internet users in the first half of 2017 was 751 million, accounting for 54.3% of the total population.

Fig 4.26 Share of e-finance users

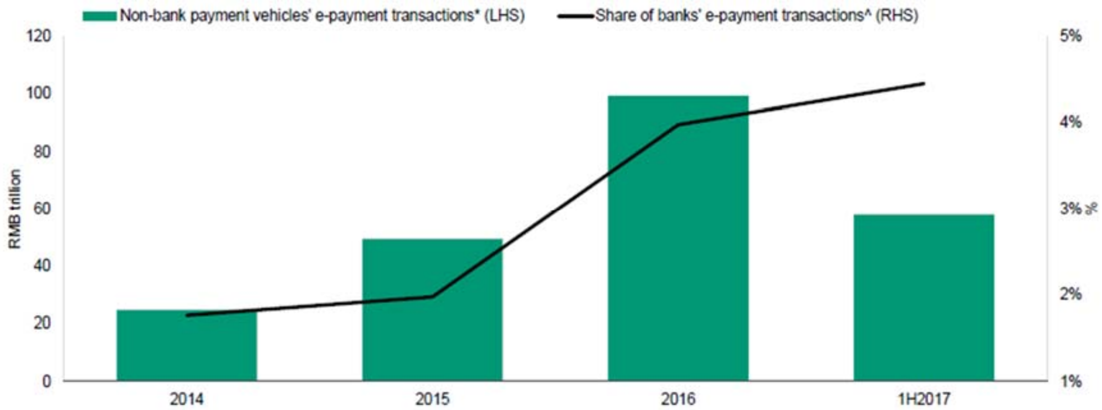


Source: China Internet Network Information Center 2017.

As the Internet becomes easier to use, electronic payments, electronic banking and online wealth management services are also growing. Nearly two-thirds of Internet users use electronic payments (68%) and half use electronic banking (50.9%). Online wealth management services, though relatively small, are rising.

As time gone, Chinese government stepped up oversight of non-bank electronic payment transactions. Although the electronic payment transactions overall share of dealing with non-bank electronic payment by bank electronic platform processing compared to trading volume is still small, but growing steadily since 2014, to 4.5% of the total amount of electronic payment transactions in the first half of 2017 as Fig 4.27 below:

Fig 4.27 E-payment transactions

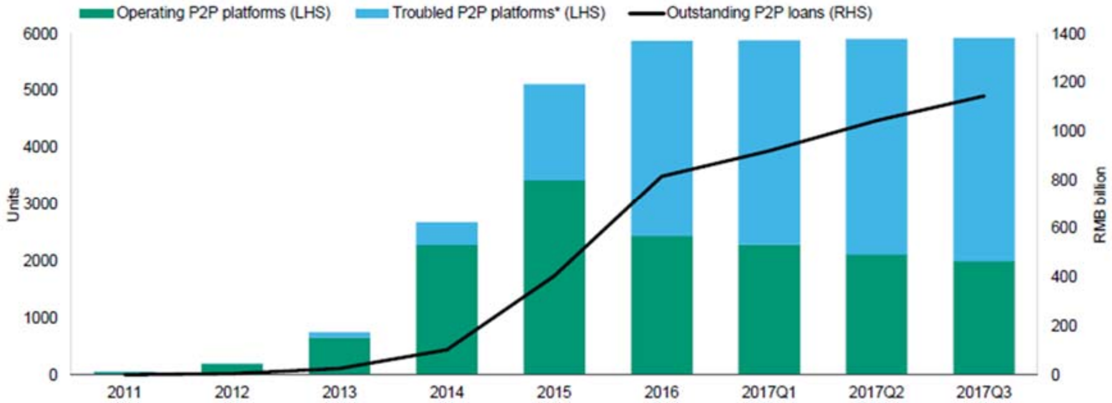


Source: Moody's 2017.

In August 2017, the People's Bank of China accelerated the regulation of the rapidly growing third-party payment industry[8], requiring that all online payments be cleared through a unified platform. Online payment supervision will be further concentrated.

[8] News from money.163.com.

Fig 4.28 P2P lending.

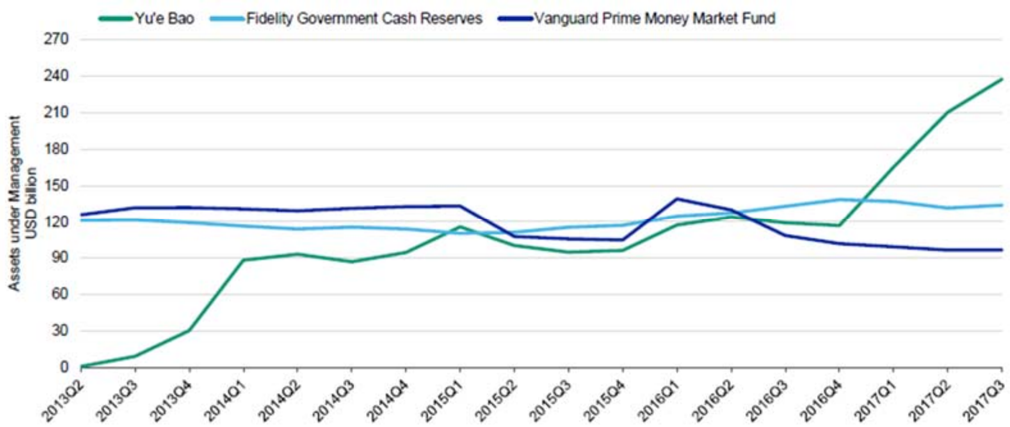


Source: Moody’s 2017.

Recent years in China, the peer-to-peer lending grew moderately, by the end of 2017 at the end of the third quarter, China through peer-to-peer (P2P) lending expanded micro credit balance of RMB 1.15 trillion. However, in the third quarter of 2017, the number of operating platforms continued to fall by 5.2% in the first half of 2017 and fell 13.5% in the first half of 2017. Since risk management is weak leading to high default rates, P2P lending has attracted regulatory concerns, although so far, it has not yet constituted a systemic risk in view of the small size of the industry (approximately 1.6% of the total number of shadow banking assets as of 2016).

As example, by 2017 at the end of the third quarter, assets under management (AUM) jump in dollar terms to $238 billion, Yu’e Bao is still the world's largest money market funds as Fig 4.29 below:

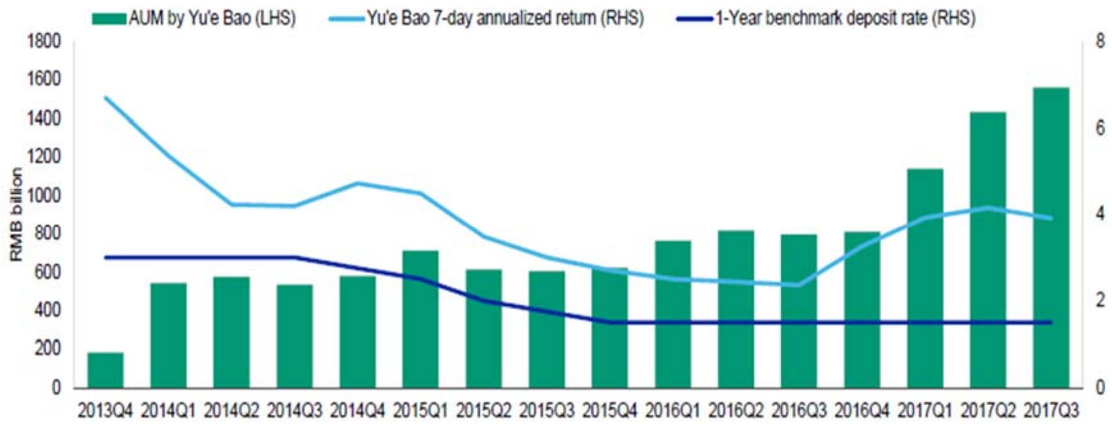
Fig 4.29 Comparison of several biggest money market funds



Source: Moody’s 2017.

The AUM growth of Yu'e Bao fell significantly to 9 per cent in the third quarter of 2017, compared with 41% in the first two quarters and 26 per cent in the first two quarters, although it reached a new high of 1.56 trillion yuan. The slowdown in asset growth appears to be due to a combination of tighter regulation and lower yields. As of the third quarter of 2017, the fund's seven-year annualized yield fell below 4.0%. This may reflect the rules of the securities and futures commission released in August 2017, aimed at improving liquidity risk management of money market funds (MMF) industry, focus on big investors focus on potential risks of MMF as Fig 4.30 below:

Fig 4.30 Yu’e Bao assets



Source: official report from Yu’e Bao 2017.

After the decision in May 2017 to reduce the upper limit of the individual account balance to RMB 250,000 yuan from the previous rmb100 million, the fund announced that it will further reduce the cap to RMB 100,000 in August 2017, which will further improve its liquidity risk management.[9]

4.2.4 Trust sector

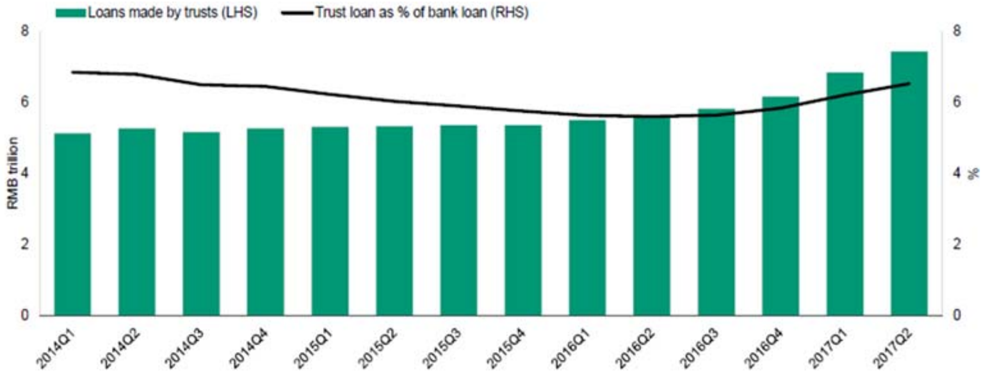
Nowadays in China, the trust lending growth remains strong. In the first two quarters of 2017, credit lending surged as credit lending soared in the second half of 2016. The strong growth reflects the CBRC's July 2016 decision[10] to tighten the bank's

[9] News from Yu’e Bao official announcement.

[10] News from CBRC 2016.

WMP business rules. The proposal specifies that the trust sector is the only allowed intermediary channel for banks to invest in non-standard debt assets. As a result, the trust industry is now playing an increasingly important role as a conduit for bank transfers and expansion of shadow credit, while the ability of non-bank financial institutions as regulated by the China securities regulatory commission has been reduced as a conduit for bank transfers, which shown as Fig 4.31 below:

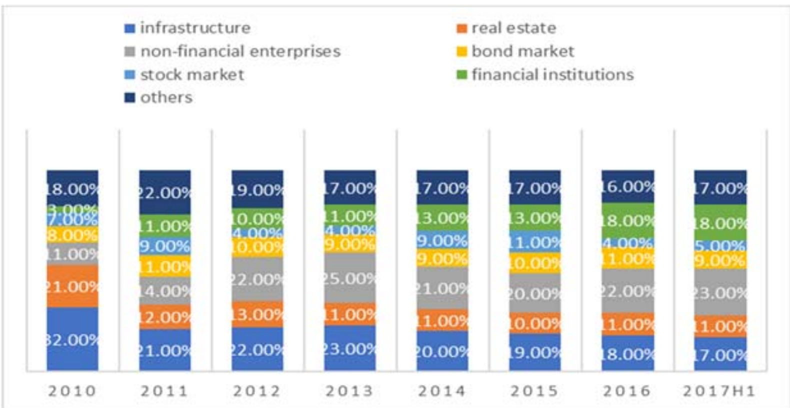
Fig 4.31 Growth of trust loans



Source: China Trustee Association 2017.

However, regulators have recently stressed that trust companies are increasingly exposed to real estate and overcapacity. Tighter rules on trust loans could increase refinancing risks for corporate borrowers that rely heavily on shadow credit, which can be presented below:

Fig 4.32 Trust sector assets

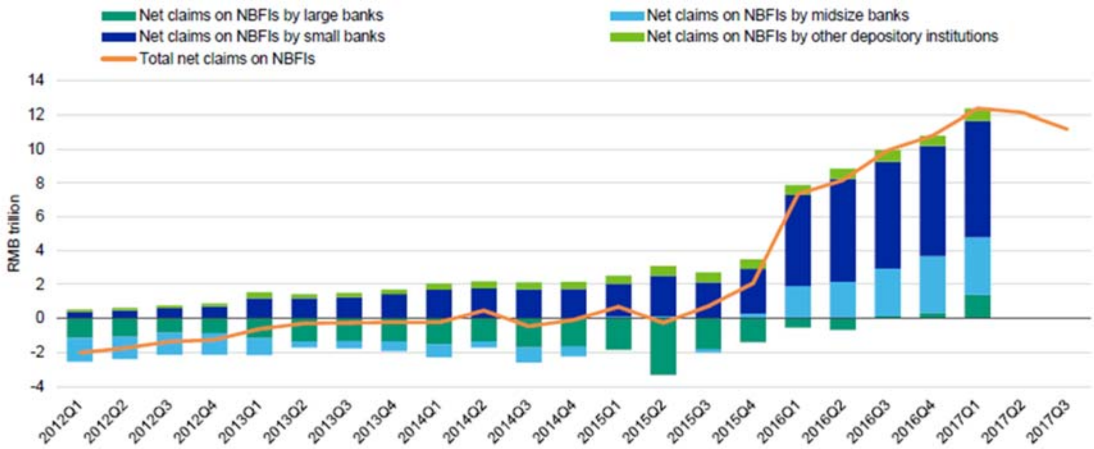


Source: Author’s calculations based on data from China Trustee Association 2017.

4.2.5 Interconnectedness and Spillover Risks to Banks

The relationship between Banks and non-bank financial institutions has declined slightly recent years in China. In the past three years, signs of a rapid rise in the interconnections between Banks, mainly small and medium-sized Banks, and shadow Banks have begun to emerge. Banks' net claims to non-bank financial institutions fell in the third quarter of 2017. Tighter regulatory restrictions on transactions between Banks and non-bank financial institutions have slightly reduced the scope of regulatory arbitrage as Fig 4.33 below:

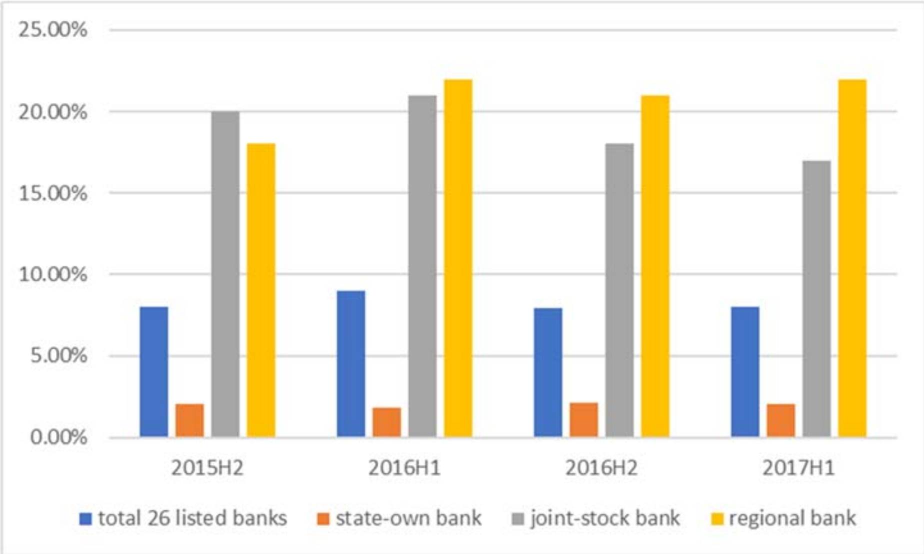
Fig 4.33 Net claims on NBFIs



Source: People's Bank of China 2017.

According to data from Fig 4.34, by June 2017, investment in accounts receivable from absolute value further dropped to 11.4 trillion yuan, from 2016 at the end of 11.8 trillion RMB to 11.4 trillion RMB. Their share of total assets fell to 7.7% from 8.4% in the same period. But there are different trends among Banks.

Fig 4.34 Investment receivables of major traditional banks in China (investment receivables as % of total assets)

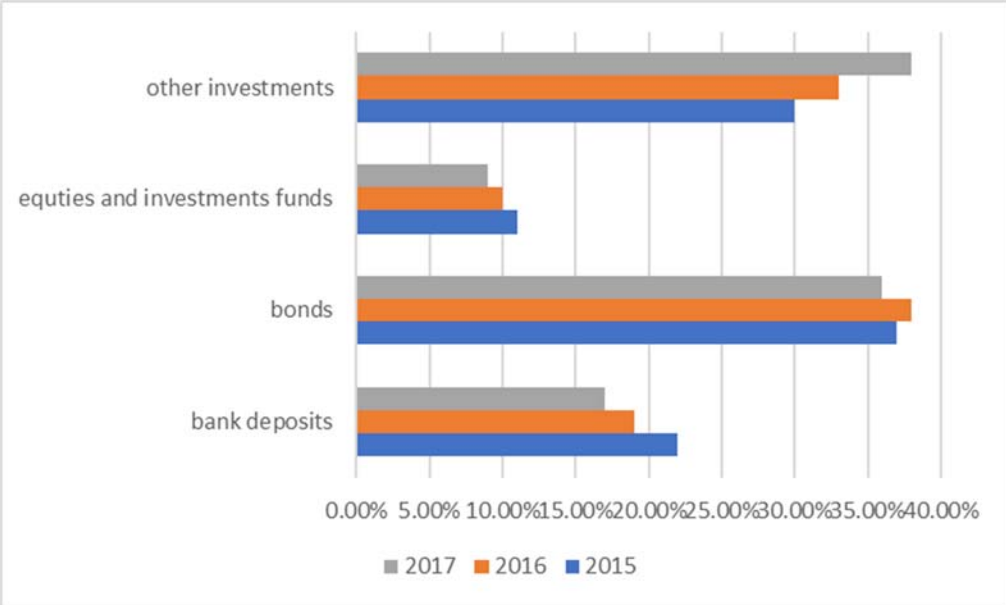


Source: Author's calculations based on data from Moody's.

From Fig 4.34 above, the nine listed joint-stock Banks reported a significant decline in investment receivables relative to assets. In contrast, the 12 regional Banks' investment receivables grew faster than the total asset growth rate of the first six months of 2017. Limited asset composition and asset quality disclosure may mask potential credit risks, which are increasingly concentrated among regional Banks.

Also, the insurance sector become a new source of shadow finance in China. Insurers have shifted their asset allocation on so-called "other investments" and stocks after easing restrictions on permitted investment assets in 2012. "Other investments" mainly include project debt plans and broad shadow banking products such as asset management products, trust plans and other alternative investment tools. The continued growth of alternative investments is bad for credit because it reduces the transparency of insurers' assets and undermines their return on stability and liquidity. These investments generate additional credit risk. Small and medium-sized insurers are more vulnerable because they are less able to manage alternative investment risks. It presented as Fig 4.35 in the following:

Fig 4.35 Insurers' investments (as % of insurers investments)



Source: Author's calculations based on data from Moody's 2017.

4.3 Summary of potential risk and regulation of shadow banking system in China and European Union

After the analysis of shadow banking system in both China and European Unions, we find out that in recent years there were rapidly expansion of shadow banking system in both China and European Union after the financial crisis in 2008. Nowadays, the various types of shadow banking business have been more and more important in Chinese and European Union's financial system, due to the short-term of development of shadow banking system, most of regulatory and investors are lack of the control of the shadow banking business, which results that there still are some unknown risks could influence the stability of original financial system. Moreover, most individual investors and financial institutions are losing their confidence of the single and traditional investments tools, which made them turn to invest in shadow banking business, meanwhile, they are facing the challenge of avoiding the risks and so did regulatory.

Tab 4.1 Size of shadow banking (trillion euros)

	Chinese shadow banking business	European Union shadow banking business
Size of shadow banking as % of GDP 2016	86.5%	272%
2015	64.9%	217.6%
2014	51.9%	171.36%
GDP 2016	9.08	13.367
2015	8.971	13.306
2014	8.455	15.106
Size of shadow banking 2016	7.8542	36.358
2015	5.819	28.954
2014	4.388	25.886

Source: Author calculations based on data from World-bank.

According to Tab 4.1, we can find out that the shadow banking system undertake more responsibilities of financial system in European Union than it in China. As we mentioned before, the most risks of shadow banking business are unknown, which means that the European Union are facing more potential risks of shadow banking system, the rest can be done in the same manner, the regulation of shadow banking system would be harder to establish perfect in European Union than it in China.

Tab 4.2 Core types of shadow banking business

China	European Union
Entrust loans	Investment funds
Wealth management products	Financial vehicle corporations
E- finance	Derivatives
	Securities financial transactions
	Repos

Source: Author.

According to Tab 4.2, accompanied with some information introduced before, we find out that the most popular types of shadow banking business in both China and European Union.

After the specific analysis of each tool of shadow banking business, we discover that the most of shadow banking business in China are highly related with traditional banks, which could not be separated with the unique national conditions of China. Due to this kind of reasons, in my own opinion, the potential risk normally could be found earlier and controlled well in the early stage, after all, the traditional banking system have run a lot of years, which means that the regulation has been matured and the potential risks could have their way to find. For example, the entrust loans must through the traditional banks to issue in China; the wealth management products are only legally done in traditional banks; the Yu'e Bao, which has the most market share in China as E-finance, it has to have corporation with commercial banks.

For European Union shadow, the most popular types of shadow banking business are related to new financial investment tools based on original financial system. In other hand, these kinds of new financial investment tools normally have high risk in the process, which would lead to hard control in them. Although the European financial regulatory have started their attention on them, they do still have no effective regulations about these kind of business. As a result, the shadow banking business are facing more unknown risks which could not be controlled in European Union.

In China, the regulation on shadow banking system, which has not been established perfect yet. The only one official regulation from the Chinese government is that the Chinese state council 107th article. It measures that according to the principle of who is responsible for the risk disposal of the organization. For example, the wealth management business of banking institutions is supervised by the China Banking Regulatory Commission; the wealth management business of securities and futures institutions and various private equity investment funds are supervised by the China Securities Regulatory Commission; the wealth management business of insurance institutions is supervised by the China Insurance Regulatory Commission; the financial institutions' cross-market wealth management business and third party business are The central bank is responsible for regulatory coordination.

According to European Commission, there was a regulation on the transparency of securities financing transactions in November 2015, These rules increase transparency, reporting and disclosure requirements for organizations involved in the SFT, making it easier to monitor and assess the risks involved in these transactions.

Finally, based on previous analysis, Europe has more matured financial system than China, they could have more experience to regulate the risk of new financial business which are shadow banking business. In other hand, China commands all shadow banking business to follow the rules, which means that if they wanted to do the business, they must have corporation with traditional banks, this way could make Chinese government easier to regulate them, and now, it seems works well. So, it is hard to determine which one have low risks or effective regulations, because they all have their own merits and demerits. Shadow banking system is still a new financial system for both China and European Union, no one has established the perfect regulation system on regulating the shadow banking system yet, they all need time to fix the problems of risks and regulations about it.

5 Conclusion

Due to the different national conditions, there are a lot of differences between China and European Union in the aspect of shadow banking system. However, they have a same reason why shadow banking system appear, which is that after the financial crisis in 2008, individual investors and financial institutions were not satisfied with the traditional banks to finance.

The goal of this thesis is the description and the analysis potential risk and regulation of shadow banking system in China and European Union.

The thesis is divided into five chapters, the first and fifth chapter are introduction and conclusion, the second chapter is the theoretical background of the shadow banking system, the third chapter is the description of shadow banking system in European Union and China, and the fourth chapter is the analysis of potential risk and regulation of European and Chinese shadow banking system.

For China, which is a socialist country, it means that the central government would dominant most of activities, including the financing. However, Chinese government also want to make their financial system more diversification, as we know, most of biggest banks are owned by Chinese central government, so they absolutely want to understand most of financing activities to reduce the risks, in order to prevent their citizen from losing. The government command all participants of shadow banking business get relationship with traditional banks, which could reduce the 'shadow' of business, thereby it could reduce the potential risks well and also establish a better regulation. Nevertheless, the financial system of China is not matured as it in European Union, which means that the Chinese government are lack of experience of making regulation in shadow banking system, compared with European Union regulatory.

Most countries in European Union are capitalist countries, their financial market seem like more liberalization than it in China. Absolutely, most of participants of shadow banking business, they do not need make relationship with traditional banks, they could be more 'shadow' to finance, moreover, this phenomenon would lead the shadow banking system easier to evade regulation, in the same time, it could bring a lot of unknown potential risks to investors. However, most of countries in European Union are developed countries, they have established a matured financial system before the appearance of shadow banking system, obviously they would have more experience to make a new way to regulate the shadow banking system well.

Based on previous analysis, due to the different national system, although the Chinese government would permit the shadow banking business operate in China, they want to help investors to prevent the potential risks from shadow banking business. That's why they make most of shadow banking business involved into their familiar area, making relationship to traditional banks they owned, which could make them easier to make the regulation. Most countries of European Union, they have matured financial system, moreover, they indulge most participants of shadow banking market to free operate, which have resulted that the size of shadow banking business have accounted for 272% of GDP in 2016, it presents they would have more risks that if most of shadow banking business failed, which could influence their financial system. In summary, Chinese and European Union have their merits and demerits in prevention of potential risk and regulation, it is hard to say which one is better.

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List of Abbreviation

NBFI	Non-bank financial institution
CIV	collective investment vehicles
ABS	Asset-backed securities
MBS	Mortgage-backed securities
RMBS	Residential Mortgage-Backed Securities
CMBS	Commercial Mortgage-Backed Securities
CMOs	Collateralized Mortgage Obligations
CDOs	Collateralized debt obligations
CLOs	Collateralized loan obligations
CBOs	Collateralized bond obligations
CRECDOs	Commercial real estate collateralized debt obligations
CDS	Credit default swap
OTC	Over-the-counter
ABCP	Asset-backed commercial paper
P2P	Peer to peer
SMEs	Small and medium-sized enterprises
CAGR	Compounded annual growth rate
CBRC	Chinese banking regulatory commission
MFI	Monetary Financial Institution
IFs	Investment funds
FVCs	Financial vehicle corporations
MMFs	money-market funds
GDP	gross domestic product
ECB	European central bank
IRs	IRs: interest rate swaps
CDS	CDS: credit default swap market
FX	FX: Foreign exchange
ICMA	International capital market association
SFTs	Securities financing transactions

ESMA	European securities and market authority
WMPs	Wealth management products
CSRC	China Securities Regulatory Commission
TSF	Total social financing
NCD	Negotiable certificates of deposit
MPA	Macro-prudential assessment
NSDA	Non-standard debt assets

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Xu Shiyuo 许仕玉

Student's name and surname

List of Annexes

Annex 1: European Union financial sector (trillion euro)

	Monetary financial institutions (excluding money market funds)	Money market funds	Non-MMF investment funds	Other financial institutions	Insurance corporations and pension funds
2012	53.2	1.1	8.5	22.3	12.8
2015	49.6	1.3	11.7	26.6	16.1
2016	50.4	1.2	12.3	26.8	16.5

Annex 2: Euro area FVCs' assets (trillion euro)

	securities loans	debt securities	other securitized assets	other assets
2010	1.51	0.3	0.1	0.5
2011	1.49	0.28	0.1	0.6
2012	1.38	0.27	0.1	0.5
2013	1.3	0.26	0.1	0.4
2014	1.25	0.25	0.1	0.4
2015	1.26	0.24	0.1	0.3
2016	1.24	0.23	0.1	0.3

Annex 3: EU derivatives markets in 2017 (billion euro)

	G 16 dealers	Banks	ICPFs	Other financials
IRS	1000	120	180	200
FX	600	420	20	215
CDS	300	20	0	10

Annex 4: Size of banks and shadow banking business in China (trillion RMB)

	Shadow banking	Bank loans	Total bank assets (including bank loans)
2011	20	60	110
2012	25	65	125
2013	30	70	140
2014	35	75	155
2015	40	80	170
2016	50	85	185
2017	50	90	200

Annex 5: Regulatory crackdown in China (as % of total shadow banking assets)

	Trust loans	Entrusted loans	Undiscounted bankers' acceptances	Assets funded by WMPs^	Others
2013	15%	22%	21%	20%	22%
2014	13%	23%	17%	27%	21%
2015	10%	21%	11%	40%	18%
2016	10%	21%	6%	47%	17%
2017	11%	21%	7%	43%	18%

Annex 6: Asset management business in China (trillion RMB)

	2014	2015	2016	2017Q1	2017Q2
Trust companies	14	6.5	20	22	23
Fund companies and subsidiaries	6	13	17	16.5	15
Securities firms	8	12	18	19	18.5
Insures	9	11	13	14	14.5

Annex 7: Financial sector asset composition in China

	Five biggest banks' assets	Small and midsize banks' assets	Other depository corporations' assets	Assets under management by NBFIs	Central bank assets (excluding foreign assets)
2010	42%	21%	23%	9%	4%
2012	38%	23%	23%	12%	3%
2014	33%	24%	23%	16%	3%
2016	28%	25%	22%	20%	3%
2017Q2	28%	24%	22%	20%	3%

Annex 8: Changing WMPs of banks in China (outstanding WMPs as % of total assets)

	joint-stock banks	city commercial bank	state-owned bank	rural financial institutions
2014	17%	27%	28%	26%
2015	9%	13%	16%	14%
2016	9%	12%	11%	15%
2017H1	2%	3%	6%	5%

Annex 9: WMPs asset breakdown in China

	bonds	non-standard debt assets	money market instruments	cash and deposits	equity-like products and others
2014	29.80%	20.90%	14%	26.60%	8.70%
2015	29.50%	15.70%	21.50%	22.40%	10.90%
2016	43.80%	17.50%	13.10%	16.60%	9%
2017H1	42.50%	16.10%	11.70%	15%	14.70%

Annex 10: Trust sector assets in China

	infrastructure	real estate	non-financial enterprises	bond market	stock market	financial institutions	others
2010	32.00%	21.00%	11.00%	8.00%	7.00%	3.00%	18.00%
2011	21.00%	12.00%	14.00%	11.00%	9.00%	11.00%	22.00%
2012	22.00%	13.00%	22.00%	10.00%	4.00%	10.00%	19.00%
2013	23.00%	11.00%	25.00%	9.00%	4.00%	11.00%	17.00%
2014	20.00%	11.00%	21.00%	9.00%	9.00%	13.00%	17.00%
2015	19.00%	10.00%	20.00%	10.00%	11.00%	13.00%	17.00%
2016	18.00%	11.00%	22.00%	11.00%	4.00%	18.00%	16.00%
2017H1	17.00%	11.00%	23.00%	9.00%	5.00%	18.00%	17.00%

Annex 11: Investment receivables of major traditional banks in China (investment receivables as % of total assets)

	total 26 listed banks	state-own bank	joint-stock bank	regional bank
2015H2	8.00%	2.00%	20.00%	18.00%
2016H1	9.00%	1.80%	21.00%	22.00%
2016H2	7.90%	2.10%	18.00%	21.00%
2017H1	8.00%	2.00%	17.00%	22.00%

Annex 12: Insurers' investments in China(as % of insurers investments)

	bank deposits	bonds	equties and investments funds	other investments
2015	22.00%	37.00%	11.00%	30.00%
2016	19.00%	38.00%	10.00%	33.00%
2017	17.00%	36.00%	9.00%	38.00%