

EVALUATING THE REASONS FOR THE RISE OF SHADOW BANKING IN THE UNITED STATE AND CHINA

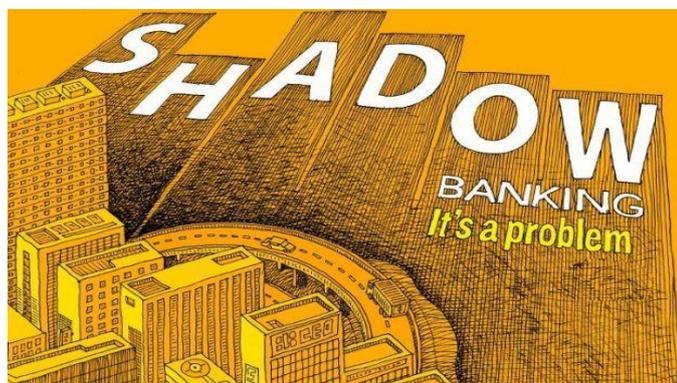
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ABSTRACT:

Shadow banking has rapidly grown in the United States and China over the years, which exhibits unique driving forces, components, players and risk profiles. Notwithstanding the differences between the two, they give rise to similar regulatory concerns, including systemic risk and regulatory arbitrage, difference is that China's commercial and shadow banking systems are absent of many of the mechanisms that allowed the U.S. to regulate its way out of America's financial crisis.



BACKGROUND OF THE REPORT:

INTRODUCTION:

The concept of shadow banking system(SBS) as a set of organisations and markets, comprise of diverse responsibilities which include traditional banking activities but does so outside regulatory jurisdiction environment (Bernanke, 2012). Shadow banking system was first conceived by an investment manager and economist Paul McCauley in 2007(Kodres, 2013).According to financial stability report(2017), SBS is defined as credit intermediation which engage into

operations and enterprise similar to conventional banking system through non-bank channels which can result into systemic risk.

The major reasons for the rise of SBS before the crisis is the uncertainty, for instance in 2007 households are less eager to hold shadow money due to the fact that its liquidity might evaporate (Acharya, 2013). During the crisis, SBS be came a vital source of financial instability which resulted to credit intermediation, maturity transformation, liquidity provision and the attitude of the investor to maximise more return on their investment (Bernanke, 2013).Also, another reason is a low requirement for collateral which enables SBS to make liquidity more available that allows investors to deploy their wealth and boosts assets price. It became a substitute for banking lending which is another source for the banks.

Krugman (2009) contends that the activities of shadow banking contribute to the worldwide recession. He further explains that SBS is very essential compared to commercial banks, elected officials and administrators should consider and understand that they may cause another possible financial meltdown, rather than respond by regulating the institutions. Therefore, the global financial stability board should get involved to check the excesses of these unregulated financial institutions to avoid possible financial crises and appropriate monitoring to reduce systemic risks.

Shadow banking has play essential economic functions as financial intermediation,

extension of entrusted loans, wealth management products to the new economy demand. It also play a very important role in helping to grow and improve the access to financial service. Also, it provides funding to local government financing vehicles, real estate developers by increasing gross domestic product. Similarly, it plays a role of securitisation. It has been widely reported that shadow banking activities started in the United States which spread to other countries, for example China and other European countries. SBS make credit available, liquidity and credit guarantees and encourage savings from investor that would foster economic growth and development. It is also useful economically which needs adequate management and regulations (Claessens et al., 2012).

This report aims to evaluate the reasons for the rise of Shadow Banking in the United State and China and to compare the convergence and divergence of financial innovations instruments in shadow banking. Also to illustrate how and why the shadow banking may result in rising systemic risks. Analyse measure of regulation taken to minimise risks in SB over the last 20 years.

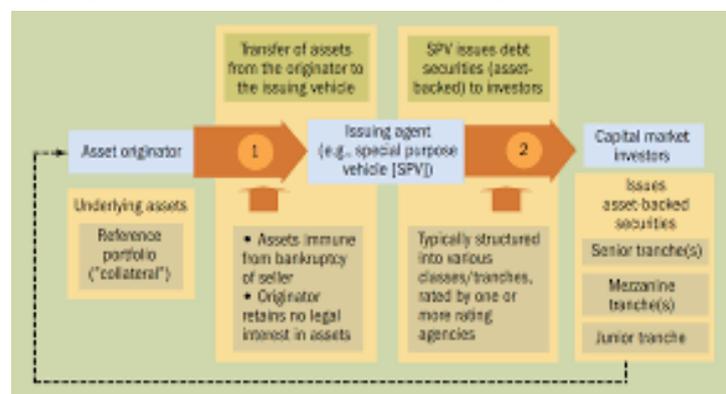
1.1 The Rise of Shadow Banking in the USA:

The emergence and rise of SBS is the increasing integration of banking with capital market (Adrian and Shin, 2009). Furthermore, they argue that commercial banks credit became less important, while securitisation funds are vital. Conventional banks diversified more sources to increase their profits, SBS overtook the activities of traditional banks, in the beginning of the early 1990s before the crisis, credit market became more critical factor. During the crisis, the financial institutions substantially decline while commercial banks engage actively in buffer duty for investors by increasing the level of the credit. Similarly, (Nersisyan and Wray 2010)

claimed that because of the deregulations of the financial system since the 70s, big banks in the US began to involve in substantial financial activities. (Please see Appendix 1)

Shadow banking system now surpasses the activities of the financial institution that are regulated (commercial banks) in regard to provide funds to customers such as households, student loans, and automobile industries before the 2008-2010 financial down (Hall, 2009). The activities of shadowbank system became connected with commercial banks between various credit channels that created systemic risk (Cowen, 2012). Investors are purchasing securities from various institutions such as mutual fund (MF), pension fund (PF), hedge fund (HF) and other financial organisations (Pozsar et al, 2010). The activities of SBS as identified by Bernanke (2013) were connected to the 2008 – 2010 global financial crises. (Zhang, 2013). This affected the bubble estate business, particularly investment banks which trust in short term loan and need to access finance via capital market. This obstacle is as a result of a decline in the value assets like mortgage which begins to fall (Jones, 2013). Mortgage securitisation lost its tempo and the size of the mortgage securities rapidly decline due to the weakness of the markets.

How Securitization works in the US:

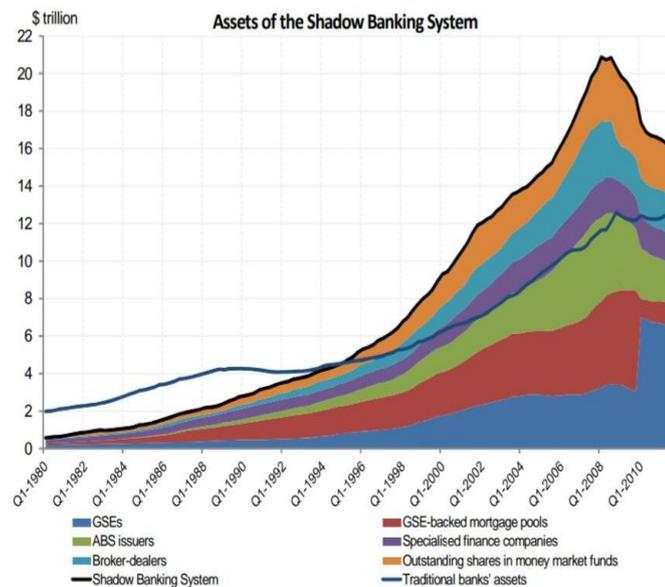


Source: IMF (2011) Source

Figure 1 in US between growth rates of securities the period 2004-2011

According to Jobst (2008), securitisation is a business of merging different types of assets to trade them to other investors. For instance, mortgage-backed securities and asset-backed commercial papers are examples of securitisation. It depends on mortgage loans associated with risk when the borrower defaults, the investor loses. In other way, it can simple mean as transfer of credit risk to those that can absorb losses, though it add to the fragility of the financial institution to leverage up by buying one another securities.

In 2007 approximately US\$ 10 trillion amount of mortgage credit and the derivatives depending on mortgage credits. (Vincent, 2013) the growth size of the assets was significantly increase similarly with the real estate prices before the financial meltdown it start to decline.



Source: Federal Reserve, DG Treasury
 Figure2 the period between1980- 2010 distribution of types of assets in shadow banking in US.

Source: Federal Reserve, DG Treasury

The table above illustrates the assets size of SBS in the US, it plays a significant role for both global and US economy, any changes in the US economy can affect another part of the world economies. In1970, the change in financial activities from traditional banking to the shadow banking began with increasing acceleration in the 80s.However, at the turn of the century.

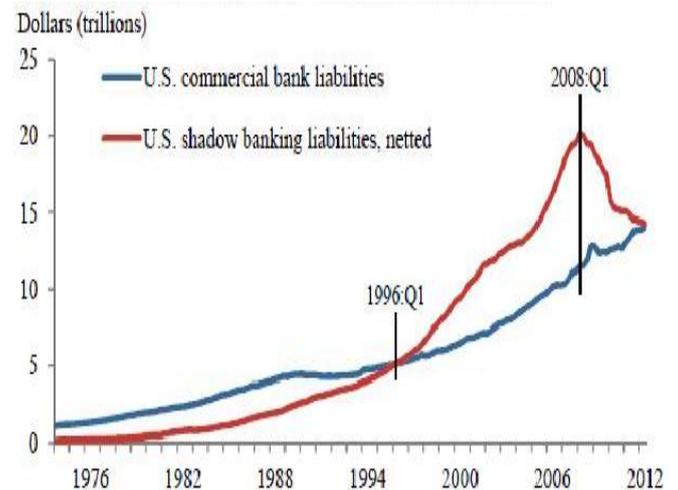


Figure 3: Shadow banking exceeds commercial banking activity Source: Federal Reserve Flow of funds (2012)

The figure above clearly identify the rise of shadow banking exceed conventional bank, although before the money crisis it was increasing, and after it decline (Pozsar e tal, .2013)

1.2 The Rise of Shadow Banking in China:

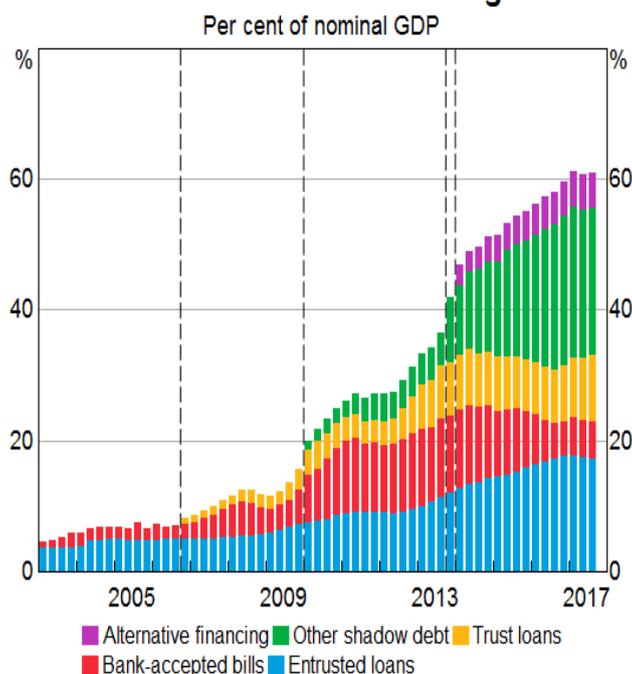
As reported bythe People’s Bank of China (PBOC),SBS refer tobanking business which serves as credit intermediation which include institutions and business outside the conventional banking industry. It provide essential service of provision of liquidity, credit transformation which could be potentially be a source of systemic risk or regulatory arbitrage8th (Elliott and Yan (2013).The growth and developments of China in the past three decade is an important period before the industrial revolution (Eichengreen et al., 2011).The rise of SBS in China is one of the most dynamic developments in China's

financial system over the past few years. Further research contends that SBS play a significant role which immensely contributed to the overall growth specifically in the suburban, towns and villages where the growth of GDP is thriving credibly (Allen, 2008).

Although shadow banking in China started operations productively before the global financial crisis of 2008, it however begins to witness significant growth within the period under review. The reasons is that the Chinese government after the crisis implemented its monetary policy which makes it more challenging to get finance (loan) through commercial banks. The impact of shadow banking has become an increasingly essential alternative source of liquidity in China. The ineffectiveness of China's traditional banking system is a central catalyst behind the rapid growth in the rise of shadow banking. For different reasons, China's commercial banking sector has a high level sophistication. Banking institutions controlled by large state-managed banks, generally favours state-owned enterprises either large firms in providing loans (Andrian, 2016). Thus, shadow banking is needed to supply liquidity to deprived firms such as private micro and small-sized firms.

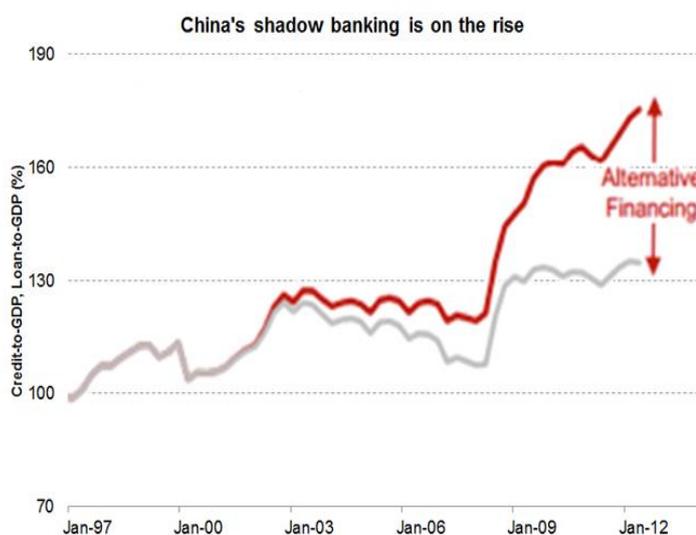
The above figure illustrate the rise of SBS before the crisis in 2000, for instance the rate is small, though it is increasing , from that period it began to increase base on the evidence provided from the graph, during the crisis it slightly decreased, but after the crisis there is a noticeable continuous increase. It indicates that approximately 273.1 billion renminbi in July 2014 compared to 1.97 trillion renminbi in June, according to (FSB, 2013).

China – Shadow Financing*



SOURCES: CEIC; RBA; Wind information (2017)

Figure 5.



Sources:Credit Suisse (2012)

Figure 4

The analyses of the above table illustrate that before the crisis the components are small, during the crisis it slightly increases while after it rises. Bank accepted bills refer to instrument of debt which is usually short term in nature. China corporate sectors and local government financing support the vast majority of their activities, while illiquid and opaque debt assets are differently challenging. In summary, the above table are instruments of SBS in China.

Below are the differences in terms of instruments

Instruments of SBS in USA	Instruments of SBS in China
1. Agency Debt that is government sponsored debt Security.	Informal loans and BB and below rated bonds
2. Municipal Bonds.	Bank Trust Cooperation Financial product
3. Asset backed securities.	Leveraged leases
4. Commercial paper which include dealer paper.	Asset backed securities
5. Assets backed commercial paper.	Negotiable Securities
6 Collateralized Debt obligations (CDOs).	Credit guarantees
	Real estate investment trust.

yields than these traditional deposits. Also in China, Wealth Management Product (WMP) is instruments of investment because it gave fixed return which is above deposits interest rates. It is different from commercial mutual funds. Due to high yield offer by WMP which lead to continued growth, it becomes an important feature of China's financial system. Though commercial bank takes active part in the investment decision, they retain control because they play a central role, because of the large product of the proportion.

Conversely, out of the above three subgroups of shadow banking participants, the first and third subgroups are the key players in the US shadow banking. These are money market mutual funds, hedge funds, investment banks, structured investment vehicles and government-managed enterprises. Shadow banking system in the US has long established its relevance in the capital markets. For instance, money market funds can function independently from traditional banks, while repo and securitisation markets are spread completely to participants, including banks and non-banks. The shadow banking in the US is more market-based, function in parallel to and to a great extent, in the rivalry for the market with traditional banks.

However, China's SBS has developed more reliance in contact with commercial banks to execute essential task of credit intermediation. Traditional banks have long had a significant role in the Chinese financial system, enjoying full benefits regarding the branch network, scale and marketing channel. Trust companies create WMP and banks use their client linkages to market them in return for a commission. The proceeds raised from the WMP are then invested by trust companies in wide-ranging assets, including money market and bond funds, small and medium-sized enterprises loans, real estate loans and local government financing vehicle loans. In short,

1.2 The Comparison and Contrast of Shadow Banking in the United States and China:

Shadow banking system in China is substantially different from its United States counterparts with its distinctive features.

1.3.1 Composition and Players:

Several financial analysts, expert and academia have come up with distinctive classification of the SBS participants and were divided into three categories. The first is the government-managed shadow banking subsystem comprising of the government operation such as the Federal Home Loan Bank System, Fannie Mae and Freddie Mac. Secondly is the 'internal' and 'external' shadow banking subsystem which makes major banks applied a series of activities of off balance sheet such as securitisation (special purpose vehicle) and strategies in assets management (Pozsar e tal, 2013).

In contrast, the Chinese shadow banking activity is influenced by China's low-interest-rate policy on deposits which brings about the emergence of wealth management products (WMP) in 2004. WMP provide investors, particularly small investors, and channel investment through which they can gain higher

the operation of the WMP system is 'bank-centric'. The trust companies need to cooperate with banks to obtain funding and mitigate the credibility problem in issuing WMP.

1.3.2 Level of Sophistication:

Developed financial system in US has led to improvement in standardisation of SB and utilises highly sophisticated financial apparatuses to offer complicated financial products include securitised loans, asset-backed commercial paper, repurchase agreements and money market funds, Securitisation, for instance, is a well-established practice in the US financial markets, performing the critical function of converting illiquid into liquid assets(Zhang, 2013).

1.4 Regulations in China Shadow Banking System:

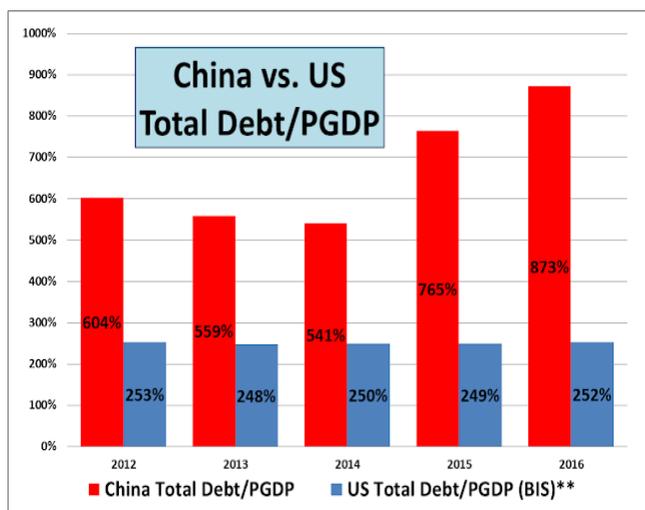
Main reason that brought Shadow banking regulation in China is increasing both efficiencies and risks which operate as a double-edged sword and also to minimise those risks while maximising, or at least not significantly impairing, those efficiencies.

The existing financial regulatory Authority in china comprising the following body, namely China Banking Regulatory Commission (CBRC), the China Securities Regulatory Commission (CSRC) and the China Insurance Regulatory Commission (CIRC) which is known as "Yihang Sanhui". The practical structure of shadow banking regulatory frame work is in the circular No. 107 which recognize the function of shadow banking with commercial banking segment, it also cautions the systemic risks associated with shadow banking. The responsibility charge by the PBOC is to regulate banking institutions activities and supervision while CBRC charge with the responsibility of regulating banking operation in China and CBRC responsible for regulating private equity investment funds and insurance companies.

Although the Circular No. 107 makes significant efforts to simplify and make clear subsection of regulatory duties, though it has some impediment. However, the development of shadow banking has significantly changed the way the financial markets operate in China, posing a serious challenge to China's traditional banking sectors.

1.4.1 Recent China Changes in Shadow Banking Regulations:

Starting in early 2017, CBRC and PBoC launched a series of measures that have aimed at various channels used to structure off-balance-sheet lending. The guidelines are to tighten rules on Business in asset management to fend off systemic risks. The Rules banned



Source: IMF reports (2016)

Figure 6

The above graph illustrates the comparison of total debt between US and China. The Chinese government introduced Total Social Financing (TSF), to track the leverage in their economy, grew to RMB 155.99 trillion RMB (US\$ 23 Trillion), up 12.8 percent from 2015, per the PBOC Report. (Pg. 28) "Total financing" required by households and businesses entrepreneur

asset managers from promising investors a guaranteed rate of return, while also requiring them to set aside 10% percent of the management charges they collect for provision purposes. In September 2017 - money market funds came under regulatory attack (Ft.com, Jan 2018).

The financial regulators proposed general rules to mitigate risks that possible escalate everywhere on distinct on assets. Rules on entrusted lending business FT.com, January 8, 2018, New Regulation on shadow banking in 2017 – CBRC has put new curbs on the country’s entrusted lending business. The CBRC at the weekend (Jan 2018) issued another rulemaking decisions for companies making entrusted loans, from providing guarantees for those loans from being used to buy equities, bonds or derivatives by the company borrowing to stem risk in the country’s financial sector (Acharya,2010).

New regulations announced by China’s securities regulator The new rules would result in an essential tightening of the regulatory risk limits that managers must carefully observe, and were likely to improve liquidity spontaneously among MMFs and to slow their rate of growth in October 2017,

1.4.2 Regulatory Measures to Mitigate the Systemic risk:

China Securities Depository and Clearing Corporation Limited (CSDC) in April 2017, declare a plan to tighten requirements using corporate bonds to serve as collateral. CBRC issues eight rules to advance regulatory efficiency risk measures for the banking sectors and investigates cross-guarantees for bank loans and identifies risky corporate borrowers (Borst, 2013)

PBOC agrees to include CDs with maturities of less than one year when calculating compliance with the wholesale funding cap of one-third of bank’s total

liabilities from 2018. CBRC necessitates all trust companies to register their products with government-backed China Trust Registration Co. by end-November 2017. CSRC releases new rules to advance the improvement of liquidity risk management in the MMF industry. focusing on risks to the MMFs posed by large investors, and their exposures to issuers with lower domestic credit ratings in August 2017,President Xi Jinping’s speech at the 19th National Congress highlights the significance of establishing a dual-pillar financial policy framework and reiterates the on-going regulatory policy priority of safeguarding the financial stability

October 2017 (Zhang, 2013).

1.5. Shadow Banking Regulations in the USA:

The recent financial panic of 2007 to 2009, numerous perspectives agree that the removal of the Glass-Steagall Act cause to the United State and failure of financial regulators to recognise the risks in shadow banking probably the most significant cause of financial crisis (Mannuel, 2011). In November 1999, President Bill Clinton signed the Gramm-Leach Act abolished part of the provisions of the Glass Steagall Act. The clearly make distinction amongst traditional banking sector and investment banks. Similarly, Congress passed fundamental regulatory reform of the financial institutions in the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010.

Dodd-Frank comprises requirement applicable to shadow banking;such as, hedge funds will now register with the Securities and Exchange Commission (SEC), over-the-counter derivatives business all should go under exchanges and clearinghouses, and Federal Reserve will monitor all vital institutions. Further regulatory reform innovations such as Volcker rule has contribute significantly which modified the oversight of credit rating

agencies. Shadow banking system should adjust with the existing policies and regulations and anticipate other forms of regulatory arbitrage and shadow banking to surface.

Though Dodd-Frank considers some valuable, essential pace in the regulation of shadow banking, there still pitfalls that are silent. Some crucial gaps involve the regulation of MMMFs, securitisation, with reports. The law fashioned by the council of regulators, the Financial Stability Oversight Council, with important power to identify and manage systemic risks, plus the power to suggest significant changes in regulation, if consider necessary for financial stability. However, arguably the above three areas contributed to the crisis and which demand for further regulation to be strengthening. MMMFs, securitisation, and repo are vital components.

The standard of TLAC has been designed so that failing G-SIBs can have comfortable loss-absorbing and recapitalisation capability obtainable in resolution for authorities to implement an orderly resolution that mitigate effects on monetary stability, avoids public funds loss and maintain adequate continuity of essential role (FSB, 2015) The US reform under the Dodd-Frank Act does little more than tuning regulatory authorities within the previous regulatory framework, which has proved to be an outdated system for a well-developed economy like the US and it has been incorporated in Basel 3.

1.6 Differences SBS between China and USA:

Looking at the differences of the activities of Shadow Banking in China, shadow banking, as previously stated, has been less complex compared to that of the United States, due to the fact that in China credit intermediation are less securitise with limited entities created. The so-called "Plain Vanilla" process suggest that credit intermediation is at

least one-step and at most two-step process in China, in short the underlying debt instrument use in the securitization process are is a singular linkage to the revenues. On the other hand in the case of the United States credit intermediation is significantly complex and beyond seven step with far more financial entities, the "vertical slicing" stated by (Adrian and Ashcraft 2016). Looking from an enforceable regulatory perspective and the ability, flexibility and independence of regulated traditional bank to shift activities to non-regulated financial institution, amidst stringent regulatory framework, the likelihood of banks in China to adopt these flexibilities is limited and non-existence compared to the United States. In retrospective regulated banks in the United States benefited from shifting their activities and it is inevitable and prospectively unlike Chinese regulated private banks, regulated banks in United States might venture into shifting their activities to non-regulated financial instructions in responsive to certain regulatory changes, such as stringent capital requirements. Supported by Vittas (1992) that tighter banking regulatory measure encourages traditional regulated institutions to circumvent intermediating capital flows through non-bank intermediation.

According to Acharya et, al (2017) the two most significant difference between shadow banking system in United States and its Chinese counterparts. In the United States the shifting process of debt obligation away from the financial institutions balance sheet to slicing, dicing and re-moulding them to a completely new collateralise and structured product rendered them to be not only very complicated but opaque in nature. Whereas in China a greatest amount of wealth management product studied around 2008 to 2014 according to (Acharya et, al., 2017) "are simple, short-term fixed income product".

Therefore, money market funds together with securitised loans and obligations are more oriented to United States. Whereas in China is underdeveloped, less sophisticated and more oriented to WMP.

CONCLUSION:

Shadow banking has rapidly grown in the United States and China over the years, which exhibits unique driving forces, components, players and risk profiles. Notwithstanding the differences between the two, they give rise to similar regulatory concerns, including systemic risk and regulatory arbitrage. From a regulatory standpoint, however, the essential advantage of shadow banking should not be disregarded. China's regulatory responses to shadow banking, as embodied in the recently issued Circular No. 107, appear to be based on a balanced view of the benefits and risks of shadow banking. It provides for guidance about the regulation of shadow banking in China. Finally, it is necessary for the Chinese government to take proactive measures to mitigate unforeseen circumstances

REFERENCES:

- 1) Accelus.thomsonreuters.com, January, 2014., (http://ihome.ust.hk/-su_mbisa/.P4).
- 2) Acharya, V. V., T. Cooley, M. Richardson, and I. Walter (2010): "Manufacturing tail risk:
- 3) Acharya, Viral V, Philipp Schnabl, and Gustavo Suarez, 2013, "Securitization without Risk Transfer," *Journal of Financial Economics*, 107, 515-536.
- 4) Adrian, T., and Ashcraft, A. B. (2016): "Shadow banking: a review of the literature", in "Banking Crises", Palgrave Macmillan UK, pp. 282-315. nking." (2010). 33 No
- 5) Allen, Qian and Quian, M. (2008). China's Financial System: Past, Present, and future, in Brandt, L. and Rawski, T. edition of "China's Great Economic Transformation", Cambridge, Cambridge University Press, PP 506-568 April 2018).
- 6) Bernanke, Ben S., (2013) Monitoring the financial system, Speech at the 49th Annual Confer-
- 7) Bernanke, Ben, Reflections on the Crisis and the Policy Response, (<http://www.Federalreserve.gov/newsevents/speech/Bernanke20120413a.html>), April, 2012.
- 8) Board of Governors of the Federal Reserve System. 2010. "Advance Notice of Proposed Rulemaking Regarding Alternatives to the Use of Credit Ratings in the Risk-Based Capital Guidelines of the Federal Banking Agencies." Joint Advance Notice of Proposed
- 9) Coase, Ronald and Wang, Ning (2012). How China Became Capitalistic, Basingstoke: Palgrave Macmillan. (www.cato.org/policy-report/january/february-2013).
- 10) Cowen, Tyler, The Age of the Shadow Bank Plan, Dave Manuel.com, Oct. 11, 2011 (1:30 pm EST).
- 11) Dodd-Frank Act at s. 106. It is worth noting that under s. 170 of the Dodd Frank Act, the Federal Reserve Board of Governors can promulgate regulations to exempt certain classes of non-bank financial companies from its supervision
- 12) [federalreserve.gov/newsevents/speech/Bernanke20120413a.html](http://www.federalreserve.gov/newsevents/speech/Bernanke20120413a.html)), April, 2012.
- 13) Eichengreen, Barry, Park Donghyun, and Shin Kwanho, 2011. When Fast Economies Slow Down: International Evidence and Implications for China. NBER Working Paper No. 16919
- 14) Elliott, Douglas and Kai Yan. "The Chinese Financial System: An Introduction and Overview." John L. Thornton China Center at the Brookings Institution Monograph Series No. 6 (July 2013).

- 15)ence on Bank Structure and Competition, Federal Reserve Bank of Chicago. Available at
- 16)<https://www.federalreserve.gov/newsevents/speech/bernanke20130510a.htm>.
- 17)Huang, Robin Hui. Banking & Finance Law Review; Scarborough Vol. 30, Iss. 3, (Jul 2015): 481-503.
- 18)Jobst, Andreas. "Back to Basics-What Is Securitization?." Finance & Development 45.3 (2008) Vincent, Jean Philippe. The Shadow Banking System in the United States: Recent Developments and Economic Role, 2013.
- 19)Jones, Huw, "Shadow Banks Face 2015 deadline to comply with first global rules", (<http://www.Reuters.com/article/2013/08/29/usg20shadowbanking-rules-idUSBRE97SOTX20130829.Dec>).
- 20)Krugman, Paul, The Return of Depression Economics and the Crisis of 2008, W. W. Norton and Company, 2009
- 21)McCulley, P. (2007). Teton reflections. PIMCO Global Central Bank Focus(August/September).
- 22)Moody's Investor Service (2013) 'Announcement: China's Shadow Banking Continues to Weigh on the
- 23)Moody's Investors Service Quarterly China Shadow Banking Monitor, February 2018
- 24)Nersisyan, Yeva, and L. Randall Wray. "The global financial crisis and the shift to shadow
- 25)Òscar Jordà, Moritz Schularick, and Alan M. Taylor. 2017. "Macrofinancial History and the New Business Cycle Facts." in NBER Macroeconomics Annual 2016, volume 31, edited by Martin Eichenbaum and Jonathan A. Parker. Chicago: University of Chicago Press.
- 26)Pozsar, Z., Adrian, T., Ashcraft, A., & Boesky, H. (2010). Shadow banking Staff Report: Federal Reserve Bank of New York.
- 27)Pozsar, Zoltan & Adrian, Tobias & Ashcraft, Adam B. & Boesky, Hayley, (2013) "Shadow banking," Federal Reserve Bank of New York Economic Policy Review, 19 (2), pages 1-16.
- 28)Pozsar, Zoltan, Tobias Adrian, Adam Ashcraft, and Hayley Boesky. (2010). "Shadow Banking." Federal Reserve Bank of New York Staff Reports no. 458 (July).
- 29)research/Moodys-Chinas-shadow-banking-continues -to-weigh-on-the-banks-PR _ 273026 (accessed 22
- 30)Shadow banking in China: A primer Douglas Elliott, The Brookings Institution, Economic Studies Arthur Kroeber, The Brookings-Tsinghua Center Yu Qiao, The Brookings-Tsinghua Center March 2015 [https:// www.Brookings .edu/ wpcontent / uploads /2016 /06/shadow _banking_china_elliott_kroeber_yu.pdf](https://www.Brookings.edu/wpcontent/uploads/2016/06/shadow_banking_china_elliott_kroeber_yu.pdf)The Regulation of Shadow Banking in China: International and Comparative Perspectives The Rise and Fall of Shadow Banking in China Sara Hsu and Jianjun Li.