Proceedings of the 3rd International Conference on Business and Policy Studies
DOI: 10.54254/2754-1169/71/20241503

Macroeconomic Effects and Regulatory Responses to Shadow Banking: A Literature Review

Yan Ge[1,a,*]

[1]*Saint Louis University, 3674 Lindell Blvd, Saint Louis, the United States*
a. yan.ge@slu.edu
**corresponding author*

Abstract: This review offers an exhaustive exploration of the shadow banking system, from its conceptual foundations to its operational intricacies. Originating as non-traditional banking entities, shadow banks have come to play a pivotal role in global finance, facilitating credit intermediation, liquidity provision, and risk distribution. While introducing innovation and additional liquidity, they also present challenges, notably evident during the 2007-2009 financial crisis. This paper delves into the functions and operations of shadow banks, the inherent vulnerabilities they introduce to the financial system, their impact on macroeconomic stability, and the evolving regulatory landscape. With a blend of theoretical insights and empirical analyses, the review sheds light on the complexities of shadow banking and the imperative for informed regulatory responses.

Keywords: shadow Banking, macro economy, regulation policy

1. Introduction

The global financial landscape has undergone significant evolution over the past few decades, leading to the emergence of non-traditional banking entities, commonly referred to as “shadow bank”. The term “shadow bank” was first coined by economist Paul McCulley, an economist at Pacific Investment Management Company (PIMC) LLC, in a 2007 speech at the annual financial symposium hosted by the Kansas City Federal Reserve Bank in Jackson Hole, Wyoming [1]. After that, “shadow bank” is typically used to refer to a single non-traditional bank entity, such as hedge funds, money market funds, special investment purpose entities (SIVs), and other non-bank financial intermediaries, and “shadow banking” refers a macro-financial system or activity with non-traditional bank. These institutions or activities, operating outside the purview of traditional regulatory frameworks, have gained considerable influence, playing pivotal roles in credit intermediation, liquidity provision, and risk distribution. While they bring innovation and additional liquidity to the market, they also introduce complexities and potential vulnerabilities.

During the 2007-2009 subprime crisis, the shadow banking system became severely strained, and many parts of the system collapsed. Many analysts and policymakers pointed to the shadow banking system as a significant accelerator of systemic risks, which culminated in the financial meltdown. Credit creation through maturity, credit, and liquidity transformation can significantly reduce the cost of credit relative to direct lending, and these conveniences lead shadow banks to easily replicate the core functions of the traditional banking system. Thus, shadow banks take on many of the same risks but with far less capital. Based on the above characteristics, shadow banks

DOI: 10.54254/2754-1169/71/20241503

can promote capital turnover and capital utilization rate, but simultaneously, shadow banks overextend credit and affect economic stability. These peculiarities have sparked a surge of academic and policy-oriented research aimed at understanding the intricacies of shadow banking and its implications for macroeconomic stability, and at developing relevant regulatory policies.

Given the prominence and potential risks associated with shadow banking, it becomes imperative to understand its operational mechanisms, growth determinants, and impacts on the broader economy. This literature review endeavors to synthesize the recent ten years of research on the effects of shadow banking on the macroeconomy and measures to regulate shadow banking in major economies.

2. Conceptual Framework of Shadow Banking

After the concept of "shadow bank" was coined by Paul McCulley in 2007, the consultative document in 2012 of the Financial Stability Board (FSB) endowed a broad definition of "shadow banking" as "credit intermediation involving entities and activities (fully or partially) outside the regular banking system" or non-bank credit intermediation in short [2]. However, there are two areas for improvement in this definition [3,4]. First, some entities that are unusually thought of as shadow banking will be covered because they provide some intermediate credit [3]. Second, it simply divides shadow banking into activities outside traditional banks [4]. To improve on the definition of shadow banking, it is proposed that shadow banking includes all financial activities, except traditional banking, which requires a private or public backstop to operate [5]. Furthermore, a new approach based on function to determine shadow banking activities is introduced. This approach suggests that shadow banking should provide various services, including securitization, which encompasses tranching of claims, maturity transformation, liquidity 'puts' from banks to Structured Investment Vehicles (SIVs), and support to par value money funds. Additionally, it should offer collateral services to support the efficient re-use of collateral in repo transactions, for Over-The-Counter (OTC) derivatives, in prime brokerage, and in securities lending. Other roles include bank wholesale funding arrangements, such as the use of collateral in repos and the operations of the tri-party repo market, as well as deposit-taking and/or lending by non-banks, which can be seen in practices by insurance companies (e.g., in France) and bank-affiliated companies (e.g., in India and China).

Besides, in the Federal Reserve Bank of New York Staff Reports, it was also divided shadow banking into three sub-systems [6]. First, the Government-Sponsored Shadow Banking Sub-System. Originating nearly 80 years ago with the creation of the government-sponsored enterprises (GSEs), this system dramatically reshaped bank funding and credit transformation. Unlike traditional banks, GSEs fund themselves through capital markets and have introduced intermediary techniques that have changed traditional banking practices. Second, the "Internal" Shadow Banking Sub-System reflects the transformation of major banks over the past 30 years, shifting from traditional deposit-funded processes to a more market-risk intensive, wholesale-funded model. Within this system, banking has evolved to be less credit-risk intensive, relying on a network of entities under Financial Holding Companies (FHCs) funded globally. Third, the "External" Shadow Banking Sub-System. Serving as a global network of balance sheets, this system emphasizes loan origination and securitization mainly from the U.S. but also involves Europe and offshore financial centers. Unlike the "internal" system, it is more a product of vertical integration and gains from specialization, with diversified broker-dealers and non-bank intermediaries playing key roles.

DOI: 10.54254/2754-1169/71/20241503

2.1. Emergence and Function in Shadow Banking

The emergence of shadow banking must satisfy some demand in the market, otherwise, it is impossible to emerge and develop until now. Kodres concluded four key functions of shadow banks [7]:

First, shadow banks provide maturity transformation obtaining short-term funds to invest in long-term projects. Second, shadow banks provide liquidity transformation that entails using cash-like liabilities to buy harder-to-sell assets. Third, investors employ techniques such as borrowing money through shadow banks to buy fixed assets to magnify the potential gains (or losses) on an investment.

Fourth, shadow banks take a borrower's credit default risk and transfer it from the originator of a loan to another party [7, p.42].

Moreover, more detailed operation stages to illustrate the function of shadow banks were given [8]. A new concept—shadow chains—was proposed, which includes four stages: The first stage is the granting of mortgage loans by banks or financial companies. Next, consolidate ("pile up") mortgage debt. The third stage is securitization. Finally, the fourth stage is to sell the mortgage bonds [8, pp.1749-1750].

Based on the above four-stage process, the shadow bank entities transform illiquid and risky debt under mid-term and long-term liabilities into externally risk-free and high-liquidity short-term obligations (repo and commercial papers) on the currency market.

Intuitively, as long as shadow banks can provide liquidity in the market, investors are willing to rely on the money from shadow banks [9, p.2383]. In conclusion, the shadow banking system gives flexible maturities and provides liquidity to assets in the market by issuing securities with high liquid by minimizing their credit default risk.

Therefore, through the above characteristics of shadow banking and services provided by shadow banks, the emergence and development of shadow banking in the market seems more logical.

2.2. Hidden Trouble of Shadow Banking

In addition to providing the market functions mentioned above, shadow banking also creates hidden trouble. In the traditional banking system, the capital cycle could be simply concluded that money flows from depositors through banks to borrowers, and then borrowers return the money through banks to depositors [10, p.263]. In this cycle, traditional banks as intermediate are supervised by the central bank and protected by deposited insurance. With the development of the economy, the demand for capital is increasing especially during the economic expansion period. The major function of shadow banks is to extend credit and provide more currency in the financial system. Shadow banks include such familiar institutions as investment banks, Money-Market Mutual Funds (MMMF), securitization, and mortgage brokers; some rather old contractual forms, such as repurchase agreements (repos); and many esoteric financial derivatives, such as asset-based securities (ABS), collateralized debts obligations (CDOs), and asset-based commercial paper (ABCP) [10, pp.261-262]. Through these institutions, contracts, and financial derivatives, shadow banks not only extend credit but also disperse currency in various channels, forms, and fields. Extending credit leads shadow banks to have lower equity requirements to support higher leverage [6, pp.1-6]. When there is a problem in cash flow, shadow banks lack enough equity to resist risk. Besides, due to the dispersion of funds, a shadow bank crisis will quickly spread and cause a very wide-ranging impact.

What's more, for regulators, dispersed currency in different channels, forms, and fields creates a harsh situation to supervise shadow banks because the relationship between every depositor,

DOI: 10.54254/2754-1169/71/20241503

borrower, institution, and financial derivatives is too complex to supervise all participators. In 2017, the European Systemic Risk Board published a report to describe the potential risks created by shadow banks, that is, liquidity risk and risks associated with leverage among some types of investment funds; interconnectedness and contagion risk across sectors and within the shadow banking system; pro-cyclicality, 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 [11].

3. Effect of Shadow Banking on Macroeconomy

In recent years of research, scholars have explored the impact of shadow banking on the macroeconomy. Based on the characteristics and market functions of shadow banking, its impact on the macroeconomy can be roughly divided into the following points:

1. Financial stability and macroeconomic volatility.

The shadow banking system, while often heralded for its ability to provide additional liquidity and credit channels, has also been scrutinized for its potential to induce financial instability. The shadow banking system, especially the repo market, played a crucial role in the 2007-2009 financial crisis. It is suggested that due to the use of securitized banking and the resultant runs on repo, vulnerabilities were amplified, leading to greater macroeconomic volatility [12]. Similarly, the work presented touched upon the inherent risks of shadow banking, emphasizing its role in the global financial crisis and subsequent regulatory challenges [8].

In 2017, the concept of 'shadow money' was creatively proposed [9, p.2382]. Unlike the general concept of broad money, shadow money includes large uninsured deposits, prime money market funds, private label repurchase agreements, financial-backed commercial paper, and asset-backed commercial paper (ABCP), and other forms of short-term wholesale funding [9, p.2383]. Thus, the liquidity of shadow money is fragile. Based on the concept of shadow money, to analyze the shadow banking effect, they presented a macro-finance model in which liquidity transformation in the financial sector drives the macroeconomic cycle. The results of the model show how shadow banking as a fragile liquidity transformation boosts asset prices and creates growth in good times at the expense of bad times.

Similarly, in their model of shadow banking, it was emphasized that vulnerabilities arise from investors' neglect of tail risks [13]. This neglect can lead to over-optimism in boom times, driving up asset prices, but can also result in dramatic corrections when the overlooked risks materialize, leading to sharp drops in asset prices. Moreover, the increased reliance on shadow banking for liquidity can lead to heightened sensitivity of asset prices to shocks in this sector. Vulnerabilities in the shadow banking sector can spill over to broader financial markets, leading to volatile asset price movements [14].

In essence, while shadow banking can provide essential liquidity and credit channels, its operations have been linked to heightened volatility in asset prices, with potential systemic implications for the broader economy [12,13,14].

2. Transmission of monetary policy.

The role of shadow banking in influencing the transmission mechanism of monetary policy is an area of growing interest. Insights into the interplay between prudential controls, such as capital regulation, and monetary policy were offered, highlighting how the risk-sensitivity of the capital framework can shape how financial institutions measure, manage, and price risks [15]. This, in turn, influences the transmission mechanism of monetary policy. Furthermore, the creation of complex financial derivatives by shadow banks adds another layer of intricacy. These financial derivatives invisibly magnify the leverage of the collateral, leading to higher leverage that can distort the

DOI: 10.54254/2754-1169/71/20241503

conventional channels for transmitting monetary policy. Additionally, these derivatives amplify investor sentiment, further complicating the policy transmission landscape.

Delving into the realm of unstable banking, the focus is on the operations of financial intermediaries in markets influenced by investor sentiment [16]. It is contended that volatility in the market prices of loans not only destabilizes bank credit and real investment but also highlights the inherent instability of banks themselves. This evolving relationship between capital regulation and the transmission mechanism suggests an increasing influence of capital standards on financial institutions' behavior, which in turn potentially impacts monetary policy outcomes. Furthermore, the increasing complexity of financial derivatives in shadow banking complicates the tracing of underlying assets and their regulation.

3. Transfer of risk to households.

With financial liberalization and innovation, there has been a notable shift of risk towards the household sector. Households today bear a more significant brunt of financial risks than before, with fewer intermediaries acting as buffers. This shift in risk ownership has profound implications for how households respond to economic shocks and monetary policy changes. As highlighted, households are increasingly holding assets more vulnerable to market risk and have seen a significant expansion of their balance sheets relative to incomes. This growing exposure has not only altered households' risk perceptions but also tested their ability to measure and manage these risks [15, p.13].

Empirical evidence of the consequences of an unchecked expansion of mortgage credit is provided, pointing to the US mortgage default crisis as a case in point [17]. It is illustrated how aggressive lending practices, often targeting less-informed households, led to a cascade of defaults, severely impacting the broader economy. This study highlights the dangers of risk proliferation in the household sector without adequate checks and balances. A comprehensive analysis of the subprime crisis is offered, tracing its origins and proposing potential solutions [18]. At the heart of this analysis is the role of households in the crisis. The dangers of transferring complex financial risks to households are underscored, especially without adequate safeguards or financial education.

Such shifts, catalyzed in part by the operations of the shadow banking system, underscore the need for a more comprehensive understanding of the financial decision-making processes of households and the consequent macroeconomic implications.

4. Regulation of Shadow Banks

With the shadow banking boom, this migration of financial activities away from regulated entities to the less-regulated shadow banking system poses challenges for financial stability and necessitates a reevaluation of regulatory frameworks to encompass this evolving landscape [19]. In past studies, there have been two main propositions for reducing the impact of shadow banks. One is adjusting the execution mode of financial derivatives. It has been suggested that regulators should change the execution rule of Money-Market Mutual Funds (MMMF), repurchase agreements (repos), asset-backed securities (ABS), collateralized debt obligations (CDOs), and asset-backed commercial paper (ABCP) to limit shadow banks expanding credit and force them to have enough equity to increase tolerance of risk [10, pp.284-289]. Additionally, the liquidity services should be provided by sponsor banks to exchange-traded funds (ETFs) or large-scale commercial bank backstops for leveraged financing and buyouts to improve shadow banks' tolerance of risk [5, p.6]. Overall, this proposition can effectively limit the expansion of credit outside traditional banks. Another proposition for reducing the influence of shadow banks is to strengthen supervision. Due to the effectiveness problems of monetary policy to shadow banks, it has been proposed that regulators should collect more data before making a monetary policy and separately consider the monetary policy impact between big traditional banks, small traditional banks, and shadow banks [10,20].

DOI: 10.54254/2754-1169/71/20241503

Moreover, it was summarized by the European System Risk Board that a set of systematic measures and methods should be implemented to enhance supervision [11]. It is believed that supervision should be based on both entities and activities. The entity-based supervising approach should use aggregate balance sheet data complemented with data from other sources [11, p.9]. In contrast, the activity-based mapping approach should aim to complement the focus on entities to ensure that all segments of the shadow banking system are captured [11, p.31]. Comparing these two propositions, each has its advantages and disadvantages. Adjusting the execution mode of financial derivatives is complex but potentially effective in curbing shadow banking activities. Implementing regulations may result in increased expenses for regulators but can improve the current situation, which lacks regulation for shadow banks. According to the two potential solutions mentioned, this article prefers the approach of modifying the execution rule of financial derivatives. Without fundamental restrictions on their activities and authority, shadow banks might use the flexibility of financial derivatives to avoid regulation, posing a heavy and costly burden for regulators [21, pp.1480-1481].

Additionally, some researchers have raised concerns about the regulation of shadow banks. It is believed that the unique nature of banks, wherein shareholders internalize only a fraction of the social costs associated with default on liabilities, sets the stage for a nuanced discussion on shadow banking regulation [22]. This distinction, driven by the role of bank liabilities as exchange media, differentiates banks from other firms and presents challenges in regulatory practices. However, the reality of imperfect enforcement introduces a scenario where not all markets, where bank assets are refinanced with money-like liabilities, can be monitored by regulators. A pivotal difference emerges between regulated and unregulated markets. In regulated markets, banks can commit to a financing policy prior to receiving private asset-related information, whereas in unregulated markets, banks make ex-post-optimal trades after acquiring this information [22, p.169]. This dichotomy leads to adverse selection issues in shadow banking, while formal banking remains unaffected. Conversely, overly stringent regulations can exacerbate adverse selection, pushing banks to offload excessive risk into the shadow banking sector to circumvent high capital requirements. Furthermore, there are concerns that ongoing efforts in regulatory reforms create a paradox: as regulations tighten around traditional banking institutions, the allure of shadow banking intensifies, primarily due to the gap between capital and liquidity mandates for regulated versus non-regulated entities [23]. The focus of these reform initiatives should be to mitigate the inherent risks posed by shadow maturity transformation, requiring transparent safeguards and credible credit and liquidity safety nets. Despite progress, current regulatory measures have yet to fully address the potential systemic threats posed by shadow credit intermediation.

5. Conclusion

The evolution of the shadow banking system underscores the dynamism of the global financial landscape. While shadow banks have contributed significantly to financial innovation, liquidity provision, and credit distribution, their operations have also brought to the fore complexities and potential systemic vulnerabilities. The 2007-2009 financial crisis served as a stark reminder of the latent risks within this sector, prompting rigorous academic and policy debates. As this review has highlighted, the challenge lies not just in understanding the intricacies of shadow banking but also in crafting regulatory policies that strike a balance between fostering innovation and ensuring financial stability. Given the rapid transformations in the financial sector and the growing prominence of shadow banks, continuous vigilance, informed policymaking, and interdisciplinary research are paramount to navigating the challenges ahead and ensuring a resilient global financial system.

DOI: 10.54254/2754-1169/71/20241503

Acknowledgments

I am grateful to Prof. Edward Vytlacil for his valuable guidance and insightful comments throughout the writing of this review. I also appreciate the resources and services provided by the Saint Louis University Library, which were instrumental in this research. Lastly, special thanks to Daokuan Bao for his moral support and guidance in the direction of my life.

References

[1] *McCulley P. Teton Reflections. PIMCO Glob Cent Bank Focus. 2007. Available from: https://www.pimco.com/en-us/insights/economic-and-market-commentary/global-central-bank-focus/teton-reflections/*
[2] *Financial Stability Board. Strengthening oversight and regulation of shadow banking. Consultative Document. 2012.*
[3] *Pozsar Z, Singh M. The nonbank-bank nexus and the shadow banking system. IMF Work Pap. 2011;(11/289).*
[4] *Cetorelli N, Peristiani S. The role of banks in asset securitization. Fed Reserve Bank New York Econ Policy Rev. 2012;18(2):47-64.*
[5] *Claessens S, Ratnovski L. What Is Shadow Banking? IMF Work Pap. 2014; No. 14/25.*
[6] *Pozsar Z, Adrian T, Ashcraft A, Boesky H. Shadow banking. Fed Reserve Bank New York Staff Rep. 2010;(458).*
[7] *Kodres LE. What is shadow banking. Finance and Development. 2013;50(2):42-43.*
[8] *Slepov VA, Kosov ME, Burlachkov VK, Grishina OA, Sakharov DM. Shadow banking: Reasons of emergence and directions of development. Int J Civil Eng Tech. 2019;10(2):1747-1754.*
[9] *Moreira A, Savov A. The Macroeconomics of Shadow Banking. J Finance. 2017;72(6):2381–2431. Available from: http://www.jstor.org/stable/26653288*
[10] *Gorton G, Metrick A, Shleifer A, Tarullo DK. Regulating the Shadow Banking System [with Comments and Discussion]. Brookings Papers on Econ Activity. 2010:261-312. Available from: http://www.jstor.org/stable/41012848.*
[11] *European Systemic Risk Board. EU Shadow Banking Monitor: No. 2 / May 2017. 2017. Available from: https://www.esrb.europa.eu/pub/pdf/other/esrb.shadowbankingmonitor1705.*
[12] *Gorton G, Metrick A. Securitized banking and the run on repo. J Financ Econ. 2012;104(3):425-451. Available from: https://doi.org/10.1016/j.jfineco.2011.03.016*
[13] *Gennaioli N, Shleifer A, Vishny RW. A model of shadow banking. J Finance. 2013;68(4):1331-1363.*
[14] *Meeks R, Nelson B, Alessandri P. Shadow banks and macroeconomic instability. Bank Italy Temi di Discussione Work Pap No. 939. 2013.*
[15] *Borio C, Zhu H. Capital regulation, risk-taking and monetary policy: a missing link in the transmission mechanism? J Financ Stability. 2012;8(4):236-251.*
[16] *Shleifer A, Vishny RW. Unstable banking. J Financ Econ. 2010;97(3):306-318.*
[17] *Mian A, Sufi A. The consequences of mortgage credit expansion: Evidence from the US mortgage default crisis. Q J Econ. 2009;124(4):1449-1496.*
[18] *Shiller RJ. The subprime solution: How today's global financial crisis happened, and what to do about it. Princeton University Press. 2007.*
[19] *Duca JV. How capital regulation and other factors drive the role of shadow banking in funding short-term business credit. J Bank Finance. 2016;69:S10-S24.*
[20] *Zhou, Tewari. Cogent Econ Finance. 2019;7:1636508. Available from: https://doi.org/10.1080/23322039.2019.1636508*
[21] *Jiang E, Matvos G, Piskorski T, Seru A. Banking without deposits: Evidence from shadow bank call reports. J Finance. 2016;71(6):2381-2417.*
[22] *Plantin G. Shadow banking and bank capital regulation. Rev Financ Stud. 2015;28(1):146-175.*
[23] *Adrian T, Ashcraft AB. Shadow banking regulation. Annu Rev Financ Econ. 2012;4(1):99-140.*