

# Reconceptualizing Stability: Dynamics of Shadow Banking in Financial Markets

**Andreea-Elena CROICU**

*Bucharest University of Economic Studies, Bucharest, Romania  
Institute for Economic Forecasting, Romanian Academy, Bucharest, Romania  
andreea.croicu@yahoo.com*

**Adrian Cantemir CĂLIN**

*Bucharest University of Economic Studies, Bucharest, Romania  
Institute for Economic Forecasting, Romanian Academy, Bucharest, Romania  
cantemircalin@gmail.com*

**Abstract.** *The purpose of this paper is to provide a thorough analysis of the existing research on the topic of shadow banking. As it has captured attention from policymakers, academics, and market participants, non-bank financial intermediaries, often referred to as shadow banking, have acquired significance due to their scale and economic ramifications. The review begins with an overview of the topic and then focuses on specific key areas, including vulnerabilities of non-bank financial institutions (NBFIs), liquidity, financial leverage, and financial stability. We provide an overview of significant contributions that clarify the connection between shadow banking and financial stability.*

**Keywords:** shadow banking, non-bank financial intermediation financial stability, liquidity, leverage

## Introduction

In the aftermath of the 2008 crisis there has been a notable shift in the landscape of financial markets. Non-Bank Financial Intermediation (NBFI) has emerged as a central player in the financial system.

Since the GFC, there is no basis to posit a diminution in the anticipated severity of financial crises; rather, there is evidence suggesting an escalation of such events (Oman, 2019). The exuberance observed in the financial markets during the Covid-19 pandemic and the ongoing conflict in Ukraine heightens apprehensions and warrants additional concern (Hodula 2023).

The turning point of March 2020 marked a critical moment, triggering market turmoil and revealing again vulnerabilities in the NBFI sector. As of the latest developments, NBFI constitutes almost half of the world's financial assets, representing a significant increase from the 42% recorded in 2008 (FSB, 2023). The growth and diversification of non-bank financial intermediation (NBFI) has resulted in increased complexity and increased interconnectedness.

In the recent years, non-bank financial intermediation, also known as shadow banking sector, is considered a major contributor to the boom-boost cycles. The shadow banking sector can be conceptualized as a vulnerable source of credit and liquidity (Pozsar et al., 2012). It extends credit to high-risk borrowers and furnishes liquidity to investors in periods of stability, yet the shadow money may dissipate when the environment becomes more uncertain (Moreira and Savov, 2017).

The importance of reevaluating stability concepts is emphasized by the complexities and uncertainties within the shadow banking system that regulators are currently addressing. To achieve this goal it is crucial not to acknowledge the vulnerabilities in shadow banking activities

but also to establish regulations that strike a proper balance, between encouraging innovation and mitigating systemic risks. The changing nature of shadow banking requires collaboration, among policymakers, researchers and market participants to examine its evolving characteristics.

Enhancing the resilience of Non-Bank Financial Intermediation (NBFI) represents the most important initiative amongst the list of FSB's key priorities as the 2023 FSB Annual Report shows. There is further a coordinated project at the Financial Stability Board to help develop bold measures to consider and mitigate systemic risks linked to NBFIs.

Strengthening the resilience of the shadow banking industry is an endeavour with the FSB and national supervisory bodies working to evaluate the impact of implemented reforms and explore additional strategies to manage systemic risks in NBFIs. Despite research efforts there remains a lack of understanding regarding shadow banking dynamics. While numerous studies have investigated specific aspects, such as securitization and money market funds, a comprehensive understanding of the holistic dynamics of shadow banking remains an area for further exploration.

Moreover, while it holds true that shadow banking can augment the economy's funding, it does so without recourse to public backstops, relying on excessive leverage and a highly susceptible funding base (Farhi and Tirole, 2021). Regulatory initiatives in the aftermath of the Global Financial Crisis of 2007–2009 have primarily targeted traditional banks. Although studies generally indicate the efficacy of macroprudential policies in curtailing excessive credit expansions (Araujo et al., 2020), mitigating asset bubbles (Bianchi and Mendoza, 2018), and diminishing systemic risk (Meuleman and Vander Venet, 2020; Ely et al., 2021; Benbouzid et al., 2022), these efforts may curtail credit access for specific (risky) borrowers (Xiong and Wang, 2022) and create incentives for banks to circumvent regulatory constraints (Avdjiev et al., 2022).

First, this study provides further insights into this background by examining the shadow banking nature dynamics as well as its input in numerous components of the financial arrangement. Additionally, it investigates relatively unknown areas with a high impact on the financial stability, for instance, the financial vulnerability associated with NBFIs, liquidity concerns, and NBFIs financial leverage. Additionally, our study examines broader aspects related to financial stability and the macroprudential policy landscape associated with shadow banking.

The paper is organized as follows: Section two provide a comprehensive overview of the existing literature with a broad focus. Section three compares different perspectives on vulnerabilities associated with Non-Bank Financial Institutions (NBFIs). An examination of liquidity concerns is undertaken in Section 4. The relationship between financial leverage and shadow banking is explored in Section 5. Section 6 is dedicated to a comprehensive analysis of the financial stability implications of shadow banking. The findings are summarized in Section 7.

## Literature review

The research, on shadow banking delves into the intricacies of systems highlighting how changes in networks and industry growth impact stability. It studies how financial institutions are interconnected how risks are transmitted and the effects on frameworks.

A very well-known study by Pozsar et al. (2013) explores the complexities of the shadow banking system focusing on its components. By examining money market funds, repurchase agreements and other elements the authors provide a view of how this sector operates. This paper meticulously analyses how various entities within shadow banking are interconnected and function as intermediators. Furthermore, the paper delves into the liquidity dynamics of shadow banking. By examining the implications of shadow banking activities for financial stability, Pozsar et al. contribute to the identification of potential risks and vulnerabilities in the broader financial system.

The study ends with policy considerations that aim to encourage innovation while addressing risks. Their findings have significantly shaped perceptions of shadow banking in literature proving valuable for policymakers, regulators and industry professionals navigating this field.

This study's value goes beyond academia; and it offers insights for policymakers, regulators and practitioners dealing with the challenges of the shadow banking sector. The research paper provides insights that have significantly influenced how shadow banking is viewed in literature. Plantin (2014) formulates recommendations to reduce these risks based on the analysis. While both studies cover the relationship, between shadow banking and traditional banks, Plantin (2014) delves deeper into interconnectedness. This study investigates how shadow banking activities could affect the capital positions of banks and recommends policymakers to use insights from Pozsar et al.(2013) creates a framework for tackling shadow banking challenges while ensuring a resilient financial system.

Over the decades researchers and academics have increasingly focused on shadow banking especially following the subprime mortgage crisis of 2008–2009. Despite a temporary deceleration in its growth during the crisis, the sector resumed its upward trajectory, experiencing more sustained expansion thereafter.

The development of shadow banking is theoretically influenced by factors on both the supply and demand sides (Poschmann, 2012; Elliott et al., 2015; Lindgren, 2018). On the supply side, regulatory arbitrage stands out as the primary motivation behind shadow banking (Adrian and Ashcraft, 2012; Plantin, 2015). Adrian and Ashcraft (2012) highlight in their literature review that regulatory arbitrage occurs when financial institutions avoid holding sufficient capital against financial exposure, sidestep additional disclosure to investors, or evade tax payments to the official sector. Strict regulations, such as capital requirements and loan-to-deposit ratios, limit the financial activities of commercial banks. In contrast, shadow banks face less stringent regulations, allowing them to offer higher returns through innovative products while expanding their credit supply.

From the demand side, Poschmann (2012) asserts that the high demand from institutional investors for alternatives to bank deposits and safe assets tends to fuel the expansion of shadow banking. This demand, to some extent, can be viewed as a specific response to the stringent regulations imposed on traditional banks. Additionally, unmet needs and preferences of commercial banks that drive non-banking activities (Fein, 2013) constitute other demand-side factors. Shadow banking arises as a response to the unmet financial needs of borrowers and lenders, particularly those who are unable to access traditional banking services. For instance, in the face of unmet credit demand, shadow banks may bridge the gap by providing additional credit sources and liquidity, thereby augmenting their asset base.

Insufficient academic attention has been devoted to exploring the potential determinants of the unregulated or less-regulated financial sector. Institutional frameworks, specifically stringent banking regulations, have been found to be associated with greater growth in shadow banking (Duca, 2016; Hodula et al., 2020). In an early contribution, Acharya et al. (2013) investigate the factors influencing the expansion of shadow banking in India.

In an examination of an advanced economy, the United States, Duca (2016) employed cointegration techniques to investigate the short- and long-term drivers of shadow banking. His findings indicate that tighter banking capital and reserve requirements exert a long-term impact on shadow banking. In contrast, deposit rate ceilings, economic outlook, and risk premiums are identified as short-term determinants.

A comprehensive cross-country study conducted by the International Monetary Fund (2014), encompassing both advanced economies and emerging markets, revealed that in advanced

economies, the main factors contributing to the growth of shadow banking include regulatory arbitrage, bank restrictions, low real interest rates, and institutional demand. In emerging markets, heightened restrictions on banks, regulatory arbitrage, government support, and complementarity with the traditional banking sector drive shadow banking. The analysis makes it clear that in some fundamental aspects, which underlies the growth of shadow banking is homogenous but in different manifestations across and within countries.

Another investigation focusing on the euro area by Malatesta et al. (2016) corroborated that economic growth, term spread, and institutional demand are influential drivers of this segment of the financial system. Hachem and Song (2016), Acharya et al. (2017), Allen et al. (2017), and Chen et al. (2018) focus on financial instruments that shadow banking created, namely Wealth Management Products and entrusted loans, respectively, and their role in financial instability. Chen et al. (2017) provide documentation on how China's four-trillion-yuan stimulus package in 2009 contributed to the rapid growth of shadow banking. Feng et al. (2019) examine the extent to which shadow money, represented by WMPs, contributes to economic growth and financial stability. Kim (2017) reported similar results, utilizing panel data primarily from G20 countries. Hodula et al. (2020) posit that monetary policy may exert an asymmetric effect on shadow banking growth. Their study argues that the cost of additional capital increases when interest rates are high, encouraging the banks to engage in securitization to avoid these kinds of fees, having a positive effect.

In a more recent contribution, Croicu et al. (2023) provide a literature review addressing the structure and impacts of nonbank financial sector regulation. The research delves into how the characteristics of shadow banking have influenced regulation and financial stability. They highlight aspects like vulnerabilities, a nuanced definition changes in fund flow organization and the limited public backing of deposits or insurance. The study also emphasizes the findings in research showing a strong link between the shadow banking sector and systemic risk. Moreover it is interesting to note that both monetary policies and financial regulations currently seem to contribute to the growth of shadow banking activities and credit leakage.

Next, our analysis focuses on the central point of this research, which is to identify “what factors make the non-bank financial system risky.” For this purpose, we adopt an approach to evaluating vulnerabilities associated with Non-Bank Financial Institutions (NBFIs). This evaluation encompasses examining drivers behind NBFIs liquidity challenges their levels of leverage and other critical considerations, for systemic financial stability.

## Methodology

A comprehensive literature search is conducted to identify relevant studies on shadow banking published in academic journals, books, working papers, and other scholarly sources. Electronic databases such as Web of Science, Scopus, and Google Scholar are searched using a combination of keywords related to shadow banking, non-bank financial intermediation, financial stability, liquidity, and leverage.

Studies identified through the literature search are screened for inclusion based on predefined eligibility criteria. Gathered studies include empirical research, theoretical analyses, and policy-oriented studies which analyse aspects of shadow banking and its dynamics.

Extracted data include study characteristics (e.g., author, year, study design), sample characteristics (e.g., type of non-bank financial institutions studied), key variables (e.g., liquidity measures, leverage ratios), empirical findings (e.g., statistical results, effect sizes), and conclusions related to the dynamics of shadow banking and financial stability.

## Results

### Assessment of Vulnerabilities of the main NBFi institutions

Understanding Non-Bank Financial Institutions (NBFIs)' vulnerabilities is crucial for rethinking financial stability in the constantly evolving shadow banking landscape. Financial institutions, including the Financial Stability Board (FSB), the Bank for International Settlements (BIS), and the International Monetary Fund (IMF) provide comprehensive frameworks and different annual assessments which we will also mention in our analysis.

Due to low interest rates, NBFIs may have become more vulnerable to financial problems. In times of stress, central banks may need to provide NBFIs with direct access to central bank liquidity. As a lender of last resort, regional and systemic NBFIs can access standing lending facilities for liquidity support, while discretionary market-wide operations are supported by discretionary market-wide operations. Liquidity support and quantitative tightening should be coordinated by central banks with financial sector regulators who are responsible for financial stability.

**Table 1. Primary Assessment of risks within the shadow banking sector**

| NBFI (GFA)                                                                                 | Financial Leverage                                       | Liquidity Risk                                                                                   | Interconnectedness                                                                                                            | Currency Mismatches                                           |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Investment funds, excluding money market funds and hedge funds (\$58 trillion, 12% of GFA) | Low, but medium for bond funds with derivative exposures | High for fixed-income funds holding illiquid emerging market/high-yield assets; medium otherwise | High, cross-border spillovers (emerging market and developing economies) and potential links to banks on derivative exposures | Low, but significant externalities to foreign exchange market |
| Insurance companies (\$40 trillion, 9% of GFA)                                             | Low                                                      | Low, but medium if subject to policy surrenders                                                  | Medium;                                                                                                                       | Low, but medium is subject to policy surrenders               |
| Pension funds (\$43 trillion, 9% of GFA)                                                   | Low                                                      | Low, but could be high in some jurisdictions                                                     | Could be high only in some jurisdictions with a large share of defined benefits schemes or negative cash flows                | Low                                                           |
| Money market funds (\$8.5 trillion, 2% of GFA)                                             | N/A                                                      | Low, but medium for prime funds                                                                  | High; key players in core funding markets                                                                                     | N/A                                                           |
| Structured finance vehicles (\$6 trillion, 1% of GFA)                                      | Medium/high                                              | Medium                                                                                           | Medium; insurance and pension funds can be large investors in structured finance vehicles                                     | Low                                                           |
| Hedge funds (\$6 trillion 1% of GFA)                                                       | Medium/high                                              | Medium; due to strengthened liquidity terms                                                      | Medium/high                                                                                                                   | Medium                                                        |

| NBFI (GFA)                                           | Financial Leverage | Liquidity Risk | Interconnectedness                                 | Currency Mismatches |
|------------------------------------------------------|--------------------|----------------|----------------------------------------------------|---------------------|
| Central counterparties (\$0.7 trillion, 0.1% of GFA) | N/A                | High           | High, given their systemic position across markets | N/A                 |

Note: GFA = global financial assets; N/A = not applicable; NBFI = nonbank financial intermediary.

Source: IMF (2023) via Financial Stability Board 2022.

Li et al. (2014) explored potential financial risks emanating from shadow banking institutions in China. Employing bank stress tests, they scrutinized solvency risks for systemic financial institutions and identified some indications of bankruptcy and liquidity shortages. However, due to insufficient data, a stress test specifically addressing these concerns could not be conducted.

Si and Li (2022), utilizing firm-level data spanning the years 2003 to 2019, conducted an investigation into the correlation between the shadow banking activities of non-financial firms and their proclivity for risk-taking. The results revealed significantly positive correlation between firms' activity of participating in shadow banking and their proclivity toward risk accruing behaviours. When the firms had tighter financing constrain and weaker corporate governance, especially in a period of loose money condition and financial pressure, the correlation was even more salient. The paths through which shadow banking impacted in the firms' risk behaving included magnified commercial credit, reduced core business performance and impaired information dissemination quality. Thus, it indicated the necessity of strengthening both external supervision and internal governance for suppressing the firms' short-termism in shadow banking and financial risks generating.

Ren and Shao (2022) conducted an examination into the influence of non-state shareholder governance on the proliferation of shadow banking within Chinese state-owned enterprises (SOEs). Through an analysis of data obtained from Chinese A-share listed state-owned manufacturing enterprises (SOMEs) spanning the period from 2008 to 2018, their study disclosed that non-state shareholders play a role in the amplification of shadow banking activities in SOMEs, resulting in augmented profits and increased managerial rewards. This participation is influenced by a widening return gap between financial and productive investments and a more stringent monetary policy.

Employing an extensive dataset of Chinese listed non-financial enterprises (NFEs) spanning from 2003 to 2019, Jiang et al. (2023) examine the impact of bank competition on corporate shadow banking activities. The authors mention that there is a negative association between bank competition and corporate shadow banking activities. Increased bank competition is found to diminish corporate reliance on shadow banking by easing financing constraints, mitigating information asymmetries, and enhancing investment efficiency for firms. These results were available to test their claims, using other metrics of core variables, accounting for regional characteristics, employing instrumental variable analysis, and difference-in-differences estimation. Our findings showed that deregulation of bank entry, inducing more competitive banking markets, can be another effective tool to restrict corporate shadow banking activities while maintaining economic development.

Han et al. (2023) examines the impact of fiscal decentralization on the shadow banking activities of non-financial enterprises, utilizing data from Chinese A-share non-financial listed companies spanning the period from 2007 to 2020. Firstly, fiscal decentralization has a positive impact on the scale of shadow banking activities among non-financial enterprises. Secondly, fiscal decentralization influences the shadow banking activities of non-financial enterprises through mechanisms involving government intervention and the subsidy reversal mechanism. Thirdly, local

government debt and tax effort play a positive moderating role in the relationship between fiscal decentralization and the shadow banking activities of non-financial enterprises.

## Liquidity

The use of financial leverage by nonbank financial intermediaries can have an adverse impact on shocks in the economy. A recent report published by the FSB has revealed that NBFIs susceptible to liquidity risks, highlighting the need for strong transparency and disclosure on effective macroprudential frameworks. There are various instances where certain sectors within shadow banking have faced challenges when times of market stress have occurred, as shown by the FSB's Global Shadow Banking Monitoring Report. We will conduct a study, on the liquidity risks of the non-bank financial institutions by analysing the data we have gathered. This evaluation aims to assess and quantify the liquidity risks faced by these institutions.

Liu and Xie (2019) investigate the influence of capital requirements on the adjustment of market liquidity. They recognize the concept that the proliferation of shadow banking has been predominantly motivated by regulatory arbitrage, specifically capital requirement arbitrage introduced by Pozsar, Adrian, Ashcraft, and Boesky (2010) or Plantin (2014). In their modelling approach, shadow banks undertake similar investments as commercial banks, involving the acquisition of risk-free assets. However, shadow banks can evade capital requirement regulations, enabling them to offer higher returns than commercial banks. Nevertheless, it is important to note that shadow bank securities cannot be utilized for the acquisition of risky projects, reflecting their lower liquidity compared to commercial bank deposits. Entities such as money market mutual funds or wealth management products can be considered as representative of this category of shadow banks. These intermediaries raise funds from investors and extend loans to commercial banks through repo and other interbank lending instruments in a wholesale bank market. Although engaging in comparable activities to commercial banks, they are generally not subject to capital requirements. Expanding on the notion that investors, by investing in shadow bank securities, gain higher returns compared to those offered by commercial banks at the expense of reduced liquidity, Liu and Xie (2019) provide compelling evidence that the scale of shadow banks expands with an increase in capital requirements.

Chen et al. (2021) investigates the impact of shadow banking on the interplay between capital and liquidity creation within China's banking industry. The study employs three trust beneficiary rights as proxies for shadow bank activities, which entail the transformation of risky corporate loans into interbank loans within the banking system. First, the findings show that these activities increase regulatory capital ratios and, therefore, create a false relationship between capital and liquidity creation ratios given that the majority of contributions come from activities that increase this ratio. The results suggest that, without adjusting for the impact of shadow banking, banks with lower capital tend to create more liquidity. Thus, the dependent variable support the financial risk-taking theory. In contrast, when considering the impact of shadow banking, the risk-absorption hypothesis is evident, suggesting that banks engage in more liquidity creation when possessing higher capital ratios.

Hodula et al. (2023) investigate the relationship between the dynamics of the shadow banking sector and various measures of uncertainty. Employing a newly established database encompassing non-bank credit intermediation in 27 European Union countries from the first quarter of 1999 to the fourth quarter of 2021, the study's focus on EU shadow banking is justified by the unprecedented growth of non-bank financial intermediation, constituting nearly 40% of the total assets in the EU financial sector as of the end of 2021. To sum up, the findings contradict the

efficacy of the shadow banking sector in providing liquidity to the economy during market-wide stress events.

### **Financial Leverage of Nonbank Financial Intermediaries**

Low interest rates and higher asset price volatility in the months following the global financial crisis have led investors and institutions to use financial leverage with additional goal to raise anticipated returns. In this situation, on the other hand, the vulnerabilities linked with leverage may go unseen. This presents problems for both regulating agencies and market players. Hedge funds, which are examples of Non-Bank Financial Institution, use sophisticated or restricted investment strategies that include leverage. The increased level of synthetic leverage has risen from 8 times to 14 times NAV on a weighted average basis.

The collateralized loan obligation market serves as an illustrative example of a securitization vehicle where leverage is intricately layered through the inclusion of underlying assets and embedded within the capital structure, encompassing equity and mezzanine debt positioned below AAA-rated tranches.

Entities operating with leverage are particularly susceptible to abrupt shifts in asset prices, and their interconnectedness has the potential to disseminate stress to sectors of the financial system that may initially appear unrelated.

This strand of literature has been relatively underexplored to date. Nevertheless, Istiak (2019) employs two structural Vector Autoregressive (VAR) models to investigate the effects of shocks to shadow bank leverage on several crucial economic indicators in both pre-2000 and post-2000 periods. Most notably, the investigation indicates that the regular contractionary rate of interest policy is feeble in influencing the shadow banks' leverage. The impulse responses derived from the VAR models indicate that shadow bank leverage has emerged as a significant economic indicator in the post-2000 period, given its capacity to impact key macroeconomic variables. In a noteworthy contribution, Feng et al. (2020) discover that the leverage factor constructed from trust companies demonstrates the ability to elucidate time-series and cross-sectional asset returns. Conversely, the leverage factor derived from securities companies, despite these entities serving as legitimate financing sources for leveraged investment, does not exhibit comparable explanatory power. These findings offer fresh evidence that financial innovations introduced by shadow banks substantially magnify leverage in less sophisticated financial markets. This phenomenon influences both financial fragility and asset prices.

This is highly relevant as leverage amplification involves the transfer of funds among households, banks, trust companies, and a category of entities known as fund-matching companies, which promote leveraged investments through financial innovations known as trust plans. The most widely adopted variant is the "umbrella trust plan," while a less prevalent version is the "mezzanine trust plan." The umbrella trust plan operates as a collective investment scheme funded by wealth management product funds borrowed by the trust company. In particular, the trust company divides the scheme into several subaccounts and enables investors to deposit money reserves or items of an identical value to acquire the cash with the subaccount.

Motivated by the escalation of shadow bank leverage leading up to the financial crisis of 2007–2008, Rottner (2023) formulates a nonlinear macroeconomic model that incorporates excessive leverage accumulation and endogenous runs to capture the dynamics and quantify the progression of instability. Introducing monetary policy into the model, the author demonstrates that the zero lower bound heightens the frequency of crises and diminishes overall welfare. The model is then applied to U.S. data to estimate the probability of a run occurring around the financial crisis of 2007-2008. The estimated run risk was already substantial in 2005 and continued to rise.

Counterfactual simulations are conducted to assess whether monetary interventions enhance welfare and could have averted the financial crisis.

Deng et al. (2021) investigated the impact of inside debt resulting from CEO compensation deferral policies on shadow banking. They developed a concise model illustrating that an augmentation in bank inside debt correlates with an increase in shadow banking activities. Empirically testing this theoretical prediction using a CEO compensation deferral policy implemented in the Chinese banking sector in 2010, the authors focused on its effect on shadow banking, as proxied by non-principal-guaranteed wealth management products. According to their findings, banks with CEO compensation deferral policy present higher levels of shadow banking activities compared to their counterparts, and this does not depend on bank size or government regulations.

Lei and Huang (2023) conducted a study on the influence of the scale of shadow banking financing for enterprises on the credit spreads of bonds. Utilizing the data from corporate bonds in China's capital markets, the research measures a significant positive effect of the fund size an enterprise acquires through shadow bank channels on the credit spreads of bonds. Additionally, the study measures sizeable moderating effects of area, property rights, and profitability. Funding corporations with shadow banks shows positives in bond credit spreads for companies in the more central and western areas, particularly less profitable companies and non-SOEs. Furthermore, another research shows that the combination of the conventional contractionary interest rate policy is inefficient in managing the leverage.

### **Financial Stability and macroprudential policy**

Moshirian (2014) asserted the significance of gathering data not only for overseeing banks but also for non-banks, aiming to mitigate global or regional systemic risk and financial instability. The author showed that if the regulatory measures intensify for systemic banks, the shadow banking sector is more prone to become more innovative.

Lu et al. (2015) conducted an investigation into shadow banking in China with the objective of assessing its potential threat to the financial system, given its predominantly unregulated nature. The study explored different dimensions of shadow banking sector in China, by its types, sizes, risks, and factors contributing to its growth. The researchers also examined the motivations behind the engagement of Chinese Small and Medium Enterprises (SMEs) in shadow banking activities and recommended financial reforms to policymakers to enhance control and monitoring of this unregulated market.

The empirical inquiry conducted by Diallo and Al-Mansour (2017) investigated the correlation between the insurance sector, the scale of the shadow system, and financial stability across countries. Employing the Z-score as an indicator of financial stability and analyzing the ratio of insurance assets to GDP for 26 countries from 1998 to 2011, their findings indicated that (i) the insurance sector exhibits a negative and statistically significant association with financial stability, and (ii) when considering the shadow banking system as a conduit, the insurance sector exerts a detrimental impact on financial stability, particularly in countries with elevated levels of shadow banking assets.

Foglia and Angelini (2020) investigated the tail risk spillover dynamics among banks, insurance companies, and the shadow banking system within the Eurozone context. The connections within the financial market have contributed to the spread of instability, making it essential for policymakers to understand and address these links. A tail-event risk model was used in this study to identify the interconnectedness and systemic risk spreading among the three sectors, based on the idea that few institutions can be large too fail and they can also be too connected too fail. This model resulted in substantial impacts between the sectors and banks as the primary

contributors of the risk. On the other hand, the study also pointed out that shadow banking companies are equally important based on the influence they have in the economy. This work is very important for understanding how risks are transmitted in the financial markets and how interconnections are a factor for the enlarging effect in crises.

Hodula and Ngo (2024) has created a new database of shadow banking in 23 European Union countries, offering a comprehensive assessment of the European shadow banking sector. The study focuses on the credit intermediation function of shadow banking and develops a refined measure of non-bank financial intermediation for each country. Additionally, this paper narrows the influence on the shadow banking credit intermediary function and creates a refined measure for each country of non-bank financial intermediation. Apparently, the macroprudential policies are more stringently applied in the majority of developed countries.

The observed effect is substantial, with the growth of shadow bank lending increasing by approximately 0.5 percentage points in the short term following the introduction or tightening of a macroprudential policy tool. This contrasts with the typically estimated negative impact of macroprudential policy tightening on traditional bank lending (De Jonghe et al., 2020). Moreover, the authors ascertain that the spillover of macroprudential policy into shadow bank lending is particularly accentuated in less capitalized banking sectors.

Athari et al. (2024) scrutinize the impact of country risk ratings on the development of shadow banking globally through a dynamic panel estimation approach spanning the period 2010–2019. The empirical results demonstrate that country risk has a positive impact on shadow banking in advanced, emerging, and global samples of nations, indicating that a lower vulnerability to risk elements promotes the growth of shadow banking.

Konstantakis et al. (2024) investigate the interdependencies between the banking sector and the shadow banking sector in selected European economies within the context of sustainable development. Employing a node-theoretic structure and a network Global Vector Autoregressive (GVAR) model, they explore the relationship between these sectors within the framework of the Sustainable Development Goals (SDGs). The study argue that the European financial markets exhibit two distinct systems: the European system, led by Germany, and the United Kingdom. Analytically, a shock to the banking sector in European economies influences the shadow banking sector of other European economies, while shocks to the shadow banking assets of individual European economies do not exhibit a statistically significant impact on the banking assets of other European countries. Moreover, disruptions to the British banking system have a profound impact on European shadow banking assets, while disturbances to European member states' shadow banking assets do not have a significant effect on British GDP. This highlights the need for international cooperation in achieving Sustainable Development Goals.

Li et al. (2024) conducted an investigation into the impact of shadow banking on the efficacy of price-based monetary policy, which employs interest rates as an intermediate target to stabilize prices. Utilizing data analysis of Chinese A-share listed companies spanning the period from 2010 to 2021, they observed that shadow banking substantially amplifies the sensitivity of investment to the benchmark interest rate, thereby enhancing the effectiveness of price-based monetary policy. Employing the implementation of the macroprudential assessment (MPA) system as a quasi-natural experiment, Li et al. (2024) further revealed a notable decrease in the sensitivity of investment to the benchmark interest rate in non-state-owned enterprises (non-SOEs).

## Conclusion

This study provides a detailed review of the existing literature on shadow banking, a term associated with non-bank financial intermediation Given its scope and significant economic

repercussions shadow banking emerges as a concern, for policymakers, researchers, and relevant market participants. Firstly, our review presents a description of existing literature, followed by an in-depth analysis of the main factors of shadow banking which affect financial market stability, including liquidity and financial leverage.

The analysis offered above led to several critical conclusions that can be summarized as follows. The observation that higher liquidity magnifies the adverse effects of such shocks suggests a serious vulnerability in periods characterized by increased market volatility, such as crises (Caraiani and Călin, 2020). The negative impact of liquidity on the response of bubbles to monetary policy shocks holds significant implications, for further research this might particularly address the case of shadow banking system. Due to the complexity of shadow banking system, these patterns are particularly revealing the non-bank financial intermediaries with a higher degree of reliance on short-term funding and liquidity. More importantly, these results may help identifying latent vulnerabilities and challenges that reveal themselves during periods of market stress.

## Acknowledgement

This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS - UEFISCDI, project number PN-III-P1-1.1-TE-2021-1339, within PNCDI III.

## References

- A. Moreira, A. Savov (2017). The macroeconomics of shadow banking *J. Financ.*, 72 (6), pp. 2381-243.
- Acharya, V., Qian, J., Yang, Z., (2017). *In the shadow of banks: Wealth management products and issuing banks' risk in China*. Working paper, New York University.
- Adrian, T., & Ashcraft, A.B. (2012). *Shadow banking: a review of the literature* (Staff Report No.580). Federal Reserve Bank of New York, New York.
- Allen, F., Gu, X., Qian, J., Qian, Y., (2017). *Implicit guarantee and shadow banking: the case of trust products*. Working paper, Imperial College London.
- Andreea-Elena Croicu, Laura Andreea Iancu, Luana Cristina Rogoian, (2023) *A Review on the Impact of Shadow Banking on Financial Markets Prudential*. Regulation Proceedings of the International Conference on Business Excellence, Volume 17, Issue 1 Pages 1596-1602.
- Boubacar Diallo, Abdullah Al-Mansour (2017). *Shadow banking, insurance and financial sector stability*. *Res. Int. Bus. Financ.*, Vol. 42, pp. 224-232.
- Caraiani, P., & Călin, A. C. (2020). *The impact of monetary policy shocks on stock market bubbles: International evidence*. *Finance Research Letters*, 34, 101268.
- Chen K., Ren J., Zha T. (2018). *The nexus of monetary policy and shadow banking in China*. *Am. Econ. Rev.*, 108 (12), pp. 3891-3936.
- Chen, Z., He, Z., Liu, C., (2017). *The financing of local government in China: Stimulus loan wanes and shadow banking waxes*. *J. Financ. Econ.*
- Chun Jiang, Ya-Qi Chang, Xinyu Ge, Deng-Kui Si (2023). *Identifying the impact of bank competition on corporate shadow banking: Evidence from China*, *Economic Modelling*, Volume 126.
- Deng-Kui Si, Xiao-Lin Li (2022). *Shadow banking business and firm risk-taking: evidence from China*. *Res. Int. Bus. Financ.*, 62, Article 101729.
- E. Farhi, J. Tirole, (2021). *Shadow banking and the four pillars of traditional financial intermediation*. *Rev. Financ. Stud.*, 88 (6), pp. 2622-2653.

- F. Malatesta, S. Masciantonio, A. Zaghini (2016). *The shadow banking system in the Euro area: definitions, key features and the funding of firms* Ital. Econ. J., 2 (2), pp. 217-237,
- Fein, M.L. (2013). *The shadow banking charade*. <http://0410agzy0.y.http.dx.doi.org.z.e-nformation.ro:9797/10.2139/ssrn.2218812>.
- Feng, X., Lütkebohmert, E., Xiao, Y., (2019). *Benefits and risks of shadow money: Evidence from the chinese WMP market*. Working Paper, Available at SSRN.
- G. Plantin (2014). *Shadow banking and bank capital regulation*. Review of Financial Studies, 28 (1), pp. 146-175.
- G. Plantin (2015). *Shadow banking and bank capital regulation* Rev. Financ. Stud., 28 (1), pp. 146-175.
- Hachem, K. C., Song, Z. M., (2016). *Liquidity regulation and unintended financial transformation in China*. NBER Working paper No. 21880.
- International Monetary Fund (2014). Chapter 2. *Shadow Banking around the Globe: How Large, and How Risky?* In Global Financial Stability Report, October 2014: *Risk Taking, Liquidity, and Shadow Banking: Curbing Excess while Promoting Growth*.
- J. Araujo, M. Patnam, A. Popescu, F. Valencia, W. Yao (2020). *Effects of Macroprudential Policy: Evidence from over 6,000 Estimates*, IMF Working Paper No. 20/67 International Monetary Fund.
- J. Bianchi, E.G. Mendoza (2018). *Optimal time-consistent macroprudential policy*. J. Polit. Econ., 126 (2), pp. 588-634.
- J. Libich, J. Lenten (2022). *Hero or villain? The financial system in the 21st century*. J. Econ. Surv., 36 (1), pp. 3-40.
- J.V. Duca (2016). *How capital regulation and other factors drive the role of shadow banking in funding short-term business credit*. J. Bank. Financ., 69, pp. S10-S24.
- Jianjun Li, Sara Hsu, Yanzhi Qin (2014). *Shadow banking in China: Institutional risks* China. Economic Review, Volume 31, Pages 119-129.
- Kebin Deng, Wenxia Ge, Jing He (2021). *Inside debt and shadow banking*. Journal of Corporate Finance, Volume 69, 102038.
- Khandokar Istiak (2010) *The nature of shadow bank leverage shocks on the macroeconomy*. The North American Journal of Economics and Finance, Volume 50, 101029.
- Kim, S. (2017). *What drives shadow banking? A dynamic panel evidence*, (Vol. 43). Bank for International Settlements.
- Konstantinos N. Konstantakis, Panayotis G. Michaelides, Panos Xidonas, Ioannis Dokas, Apostolos Christopoulos, Aristeidis Samitas (2024). *The interconnectedness of European Banking and Shadow Banking for sustainable development goals: Insights from a network GVAR model*. Research in International Business and Finance, Volume 69, 102232.
- Lindgren, M. (2018). *Regulating the Shadow Banking System in China*. International Immersion Program Papers, 78.
- M. Hodula, A. Melecky, M. Machacek (2020). *Off the radar: factors behind the growth of shadow banking in Europe*. Econ. Syst., 44 (3), Article 100808.
- Martin Hodula, Blanka Škrabić Perić, Petar Sorić (2023). *Economic uncertainty and non-bank financial intermediation: Evidence from a European panel*, Finance Research Letters, Volume 53, 103675, ISSN 1544-6123.
- Martin Hodula, Ngoc Anh Ngo, (2024). *Does macroprudential policy leak? Evidence from shadow bank lending in EU countries*, Economic Modelling, Volume 132, 106657, ISSN 0264-9993.

- Matteo Foglia, Eliana Angelini (2020). *From me to you: measuring connectedness between Eurozone financial institutions*. Res. Int. Bus. Financ., 54, Article 101238.
- Matthias Rottner (2023). *Financial crises and shadow banks: A quantitative analysis*, Journal of Monetary Economics, Volume 139, Pages 74-92, ISSN 0304-3932.
- Ningze Lei, Liqiang Huang (2023). *Corporate financing from shadow banking and bond credit spreads*, Finance Research Letters, Volume 58, Part B, 2023, 104481.
- O. Jorda, M.H.P. Schularick, A.M. Taylor (2013). *When credit bites back* J. Money Credit Bank. 45 (2) pp. 3-28.
- O. De Jonghe, H. Dewachter, S. Ongena (2020). *Bank capital (requirements) and credit supply: evidence from pillar 2 decisions*. J. Corp. Finance, 60, Article 101518.
- Poschmann, J. (2012). *The shadow banking system-survey and typological framework* (Working paper No. 27). Global Financial Markets Working Paper Series from Friedrich-Schiller-University Jena.
- Pozsar, Z., T. Adrian, Ashcraft, A., Boesky, H., (2012). *Shadow banking*. Federal Reserve Bank of New York staff report No. 458.
- S. Avdjiev, U. Aysun, M.C. Tseng (2022). *Regulatory arbitrage behavior of internationally active banks and global financial market conditions*. Econ. Modell., 112, Article 105857.
- Seyed Alireza Athari, Mugabil Isayev, Farid Irani (2024). *Does country risk rating explain shadow banking development? Insights from advanced and emerging market economies*, Economic Systems, ISSN 0939-3625.
- Ting-Hsuan Chen, Chung-Hua Shen, Meng-Wen Wu, Kuo-Jui Huang (2021). *Effect of shadow banking on the relation between capital and liquidity creation*, International Review of Economics & Finance, Volume 76, Pages 166-184, ISSN 1059-0560.
- V. Acharya, H. Khandwala, T.S. Öncü (2013). *The growth of a shadow banking system in emerging markets: Evidence from India*. J. Int. Money Finance, 39, pp. 207-230.
- W. Oman (2019). *The synchronization of business cycles and financial cycles in the Euro area* Int. J. Cent. Bank., 15 (1), pp. 327-362.
- W. Xiong, Y. Wang, (2022). *A reformulation of the bank lending channel under multiple prudential regulations*. Econ. Modell., 114, Article 105916.
- Xiaoyi Ren, Huan Shao (2022). *Non-state shareholder governance and shadow banking business: evidence from Chinese state-owned manufacturing enterprises*. Res. Int. Bus. Financ., 60, Article 101631.
- Xu Feng, Lei Lu, Yajun Xiao (2020). *Shadow banks, leverage risks, and asset prices*. Journal of Economic Dynamics and Control, Volume 111.
- Xun Han, Abuduwali Aibai, Xinyan Xie (2023). *Fiscal decentralization and shadow banking activities of non-financial enterprises*. Finance Research Letters, Volume 54, 103714.
- Y. Lu, H. Guo, E. Kao, H. Fung (2015). *Shadow banking and firm financing in China*. Int. Rev. Econ. Financ., 36, pp. 40-53.
- Z. Pozsar, T. Adrian, A.B. Ashcraft, H. Boesky (2010). *Shadow banking* Social Science Research Network, Rochester, NY SSRN Scholarly Paper ID 1645337.
- Zehao Liu, Chengbo Xie (2021). *Liquidity, capital requirements, and shadow banking*. International Review of Economics & Finance, Volume 76, Pages 1379-1388, ISSN 1059-0560.