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Solvency Capital and Its Theoretical Impact on Investment Bank Operations

SUMMARY

This review article looks more specifically at the concept of capital solvency and its relevance to the investment banks. It considers why solvency capital matters basically as a buffer for financial instability and unexpected losses and how it supports the overall health of financial institutions. This article also determines the need for capital solvency in facilitating the ability of investment banks to manage risk, maintain investors' confidence, and comply with evolving financial regulations. Key regulatory frameworks, such as Basel I, II and III, are considered to show how they influence the way banks handle capital requirements. Drawing upon a wide range of scholarly literature and regulatory reports, this review provides a succinct overview of the state of the art in capital solvency, its challenges, and how it shapes investment banking practice today.

Keywords: Capital solvency, Investment banks, Risk management, Financial regulation, Basel frameworks

JEL codes: G10, G21, G28, G32

Introduction

Capital adequacy is a fundamental concept for the financial stability of investment banks. It refers to the necessary capital reserves that a bank must maintain to absorb potential losses and continue operations in the event of a financial crisis. This capital acts as a buffer against bankruptcy, ensuring the bank's ability to meet its long-term obligations and protecting the interests of its investors and clients. The importance of capital adequacy can't be underestimated, as it underpins the flexibility and reliability of financial institutions in volatile markets (Aldasoro et al., 2022).

The challenges of maintaining capital adequacy are particularly acute in the context of investment banks. Unlike commercial banks, investment banks engage in a range of complex and high-risk financial activities, including trading, underwriting and asset management. These activities expose them to significant market, credit and liquidity risks, which require a strong capital framework to mitigate potential losses (Andersen and Juelsrud, 2024). Furthermore, the regulatory environment for

investment banks is becoming increasingly stringent, and the capital adequacy ratio is closely monitored to ensure systemic stability and prevent financial crises (Bitar and Tarazi, 2022).

HISTORICAL CONTEXT AND REGULATORY FRAMEWORK

The evolution of capital adequacy norms has been a continuous and multidimensional process, propelled by financial crises and increasing sophistication in global markets. Banks had operated earlier under relatively unfettered regulatory supervision. Capital norms were non-formal and non-standardized, and financial systems were vulnerable to crises. The banking crises of the 1980s and 1990s highlighted these weaknesses, leading to a significant reassessment of capital adequacy standards (Vasu and Gheorghe, 2014).

A key development in the establishment of international banking stability was the introduction of the Basel Accords. Basel I, first adopted in 1988, established minimum capital standards by bringing attention to credit risk and the use of risk-weighted assets. It required banks to hold capital equivalent to at least 8% of risk-weighted assets, providing a more predictable risk management model (McClure et al., 2013).

However, as financial markets developed, the need for more comprehensive regulatory enforcement became essential. Basel II came in 2004, extending Basel I with operational risk, and enhancing credit risk calculations. The aim of this development was to more closely link regulatory capital requirements to the underlying risks of banks. This time period also witnessed the continuing revisions and enhancements of Basel II, but thanks to the 2008 financial crisis, they were also found out for obvious shortcomings, most notably, their lack of coverage regarding liquidity risks and inter-linkages between financial institutions. This underscored the need for additional regulatory reforms (Jacques, 2008).

To answer to all these limitations, Basel III was introduced in 2010 as a comprehensive reform of banking regulation, which included a countercyclical capital buffer that required banks to hold additional capital to deal with potential downturns during periods of economic growth. Higher capital ratios and new regulatory requirements have been introduced, such as the leverage ratio and the liquidity coverage ratio, designed to enhance banks' resilience and mitigate systemic risks (Cummings & Durrani, 2016). To avoid repeating the systemic failures seen during the global financial crisis, this strategic buffer method was introduced (McClure et al., 2013). These frameworks have evolved and show the dynamic nature of capital requirements. This ongoing adaptation is part of ongoing efforts to respond to evolving financial conditions to ensure banks hold enough capital to safeguard the stability of the financial system and support sustainable economic development. The Basel

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Accords have also laid the foundation for a global approach to banking regulation, serving as a model for regulatory frameworks in other industries and contributing to the development of a global regulatory framework for banking (Podoaba, 2015)

REGULATORY INFLUENCES

The Basel III framework, introduced in response to the global financial crisis, represents a significant development in banking regulation, aimed at increasing the sector's resilience to economic shocks. The main thrust of these reforms is capital quality, particularly core capital, which is favoured for its better loss-absorbing capacity. This change is to ensure that banks remain well capitalized in order to better weather any financial stresses and safeguard depositors and investors. the Research emphasizes on the benefits of those enhanced capital structures, resulting in a more stable banking industry able to withstand the wreckage on the money market (Gatzert and Wesker, 2012).

The leverage ratio is an integral part of the Basel III framework, and it has been designed to provide a non-risk-based backstop to risk-based capital requirements. This ratio matters because it establishes a minimum amount of capital that a bank must keep against its total assets, and it also provides an uncomplicated measure that is not affected by the complex accounting involved in risk-weighted assets. It seeks to restrict the amount banks can leverage their own capital beyond a baseline requirement, which helps ensure they don't fail during economic downturns. The critically important Basel III leverage ratio of 3% states that a bank's Tier 1 capital must equal or exceed 3% of its total exposure (King and Tarbert 2011). And leave it to the world of risk-weighters to approach this with risk-weighted measures — to altough the risk model fails or is gamed, at least banks will have a base level of capital to deal with adverse shocks. This is all the more critical because excessive leverage caused many of the financial institutions that failed in the financial crisis. Through placing restrictions on leverage, Basel III hopes to reduce the amount of risk taken by banks that the risk-weighted capital requirement itself may incentivize (Dermin, 2015).

The leverage ratio is designed to add to the comparability of banks financial strengh across jurisdictions, because it is not subject to the different risk-assessments that can vary by country or institution. This coverage helps to create a level playing field in the International Banking Market. The implications of the leverage ratio are not only relevant for individual bank stability; by limiting leverage, the leverage ratio is one of the tools aimed at controlling the risk of systemic risks, which may be caused by interconnectedness and the amplification of losses in times of financial distress Ojo, 2015. Thus, the Basel III leverage ratio is vital in fostering a more resilient banking system that is better equipped to weather economic turbulence and promote financial stability (Hartlage, 2012).

Further, Basel III tackles liquidity risks via the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR). Two main liquidity standards that are addressed in the Basel III framework to address the liquidity risks that surfaced in the global financial crisis are: The Liquidity Funding Ratio (LCR) and The Net Stable Funding Ratio (NSFR). These LCRs mean banks need to keep sufficient high-quality liquid assets (HQLA) that can convert to cash quickly and easily to address

a 30% stress reversal. It is a short-term liquidity buffer to help keep banks from needing to face terminal financial shocks without reliance on a central bank, or cause assets to become distressed due to lending from them.

The demand for high-quality liquid assets encourages banks to maintain portfolios that balance risk and liquidity, thereby promoting financial stability. The LCR aims to improve the banking sector's short-term resilience to liquidity shocks and ensure that banks have the necessary liquidity to cover potential cash outflows during periods of market stress (Du, 2017). The NSFR, in contrast, seeks to improve the long-term stability of a bank by ensuring it operates with a stable funding structure in relation to its asset structure and off-balance sheet activities over a horizon of one year. This ratio ensures that a bank's long-term assets are financed by a stable mix of funding sources, such as customer deposits and long-term wholesale funding, instead of over-reliance on short-term funding. By establishing a minimum stable funding requirement, the NSFR reduces the risk of a funding mismatch, leading to a lower chance of liquidity shortfalls and therefore reducing the necessity for emergency funding interventions Gobat et al., 2014. Frameworks should be created that identify shortand long-term liquidity risks, to better enable banks to cope with financial shocks without endangering either its solvency or the broader financial system. These indicators, by encouraging better management of liquidity risks, help enhance the soundness of the overall global banking system (Papadamou et al., 2021).

These measures have significantly bolstered banks' ability to weather liquidity disruptions, reinforcing the sector's overall resilience (King, 2013). Even with the comprehensive nature of Basel III, some areas warrant further exploration. The long-term impact of heightened capital requirements on banks' profitability and competitive dynamics remains inadequately addressed. Moreover, the interplay between different regulatory measures and their cumulative effect on banking operations requires closer examination (Hartlage, 2012). As the banking landscape continues to evolve, it is important to understand these dynamics to refine regulatory frameworks and ensure they effectively safeguard financial stability.

SUPERVISORY MECHANISMS FOR BANK SOLVENCY

Banks are usually subject to capital solvency requirements imposed by its supervisory authorities such as a central bank or prudential supervisory authority of the country. These authorities establish capital adequacy criteria that banks should comply with to ensure they possess adequate capital to cover possible losses and uphold financial stability. In various nations, central banks have a significant influence in implementing these international regulatory frameworks, such as the Basel Accords, which prescribe global capital requirement standards. The standards are formulated by the Basel Committee on Banking Supervision (BCBS) and then adopted by the central banks or financial regulatory authorities of each country, usually adjusting the requirements to their respective financial systems (Nicolaides et al., 2012).

In Europe, the regulatory banking environment is characterized by robust mechanisms to ensure financial stability and compliance with international standards. The European Central Bank (ECB) plays a central role in this framework,

notably through the Single Supervisory Mechanism (SSM). The SSM is responsible for the direct supervision of the largest banks in the euro area, ensuring that they comply with the strict requirements of Basel III. These requirements include maintaining a high level of capital, introducing stricter risk management practices and conducting regular stress tests to assess the resilience of banks to economic shocks (Wyemersch, 2011).

The European Banking Authority (EBA) complements the ECB's efforts by providing an harmonized approach to the regulation of banks across the European Union. The EBA develops technical standards and guidelines that aim to create a level playing field for banks across the EU, fostering the stability and integration of the European banking market. Part of the work of this authority is to set capital adequacy rules, which specify the minimum amount of capital banks must hold against their risk-weighted assets. This harmonization is necessary for maintaining investor confidence and depositor protection across member states. As an EU member state, Hungary must follow these European rules in designing its banking rules. The Hungarian National Bank (MNB) is tasked with local bank regulation, requiring them to follow the Basel Accords and other EU regulations. The MNB has a fundamental role in translating complex global regulations into the local context, thereby ensuring Hungarian banks possess adequate capital buffers and adhere to prudent risk management practices. Therefore, the MNB works in close collaboration with EU institutions, ensuring the harmonization of European directives with Hungarian banking law. This collaboration makes the Hungarian financial system stable and immune to the pressure of international finance.

While banks are responsible for managing their capital to meet these regulatory requirements, they do not set the standards independently. Instead, they must comply with the guidelines and regulations imposed by external regulatory bodies to ensure solvency and financial stability. In the global context, different continents exhibit varied approaches to implementing these standards. For instance, while European countries often align closely with the Basel Accords, other regions may adopt modified versions to suit their unique financial landscapes (Flannery & Giacomini, 2015).

For all these reasons, capital adequacy standards for banks are a key component of financial regulation, and central banks and regulatory agencies play a major role in setting and enforcing these standards. This regulatory framework gives banks sufficient capital to absorb losses, thereby safeguarding the stability and resilience of the financial system in different areas (Bindseil et al., 2004).

RISK AND CAPITAL MANAGEMENT IN INVESTMENT BANKS

Investment banks operate in a high-risk environment where they face a range of risks, including market, credit, liquidity and operational risks. Understanding and managing these risks is important to maintaining financial stability and regulatory compliance.

The risks that are faced by an investment bank

Market risk is a significant concern for investment banks due to their extensive involvement in trading activities that expose them to fluctuations in market prices such as interest rates, equity prices, and foreign exchange rates. In order to preserve their financial health and profitability, it is crucial for these organizations to manage effectively to their market risk.

Investment banks use different strategies and financial instruments in order to mitigate market risk. One of the most common used tools is derivatives, which include options, futures, and swaps. These instruments allow banks to hedge against potential losses by locking in prices or rates, thus providing a buffer against adverse market movements.

Derivatives enable banks to transfer risk to other parties willing to take that risk, thereby reducing their own exposure (Instefjord, 2005). However, derivatives demand advanced risk management techniques, not only to ensure their proper use but also to avoid compromising risk management efforts. The Value at Risk, VaR models are usually used by investment banks to estimate the potential losses of their trading portfolios within a defined time horizon. Value at Risk (VaR) is a statistical measure used to estimate the potential maximum loss over a specified period for a given confidence interval, and the bank's capital for market risk is allocated based on this estimate (Reichert & Shyu, 2003). Investment banks also actively track their market risk exposures and adapt to evolving market conditions. Including stress testing and scenario analysis to understand the potential impact on their portfolios under adverse market conditions. This allows the banks to identify potential vulnerabilities and take steps to proactively mitigate risks (Majka, 2024). While derivatives are an effective tool to mitigate market risk, they are also complex and require strong governance frameworks to manage them effectively. Investment banks must ensure that their risk management practices are consistent with regulatory standards and industry best practices to maintain financial stability and protect against market volatility (Brol et al., 2011).

To sum up, market risk management in investment banks involves a combination of different methods such as sophisticated financial tools, quantitative models, and active risk monitoring. By leveraging these tools and practices, investment banks can effectively manage their market risk exposures and support their long-term financial health (Minton et al., 2009).

Credit risk is a major concern for investment banks, resulting from a client's default on its financial obligations. This risk is particularly significant in lending and trading activities, where banks lend to a variety of partners, including corporations, governments, and other financial institutions. Effective credit risk management involves a variety of strategies. This often involves credit analysis by investment banks as lenders. This may involve verification of financial statements, credit history, and overall financial condition, allowing banks to determine the risk of default and set the appropriate credit limits and terms (Witzany, 2017). Another method is used by banks to reduce the risk of credit failure, which is the diversification of their credit opportunities. Another way companies reduce the risk of credit failure is by diversifying their credit opportunities. By using risk diversification, banks can diversify their credit risk by not concentrating their exposures to any single sector, geographic region or type of counterparty. Diversification balances the portfolio and decreases threats of loss (Khokhlova & Yushina, 2019). If investment banks extend loans, they also use credit derivatives—like credit default swaps (CDS)

to hedge against the risk of defaulting on loans. Banks can transfer the credit risk attached to a particular loan or portfolio to another party, in return for a premium, via credit derivatives. By transferring credit risk, credit sales reduce the risk of potential credit losses, allowing banks to more actively manage their credit risk (Mengel, 2007). In addition, credit derivatives, such as credit default swaps (CDS), have become popular as a means of transferring and hedging credit risk. These derivatives provide banks with flexibility in adjusting their risk exposures and enable them to respond to changing market conditions without altering their core credit portfolios (Minton et al., 2009).

Liquidity risk is a significant challenge for investment banks, it presents the risk of failing to meet short-term financial obligations because of difficulties in liquidating assets or obtaining funding. This risk is pronounced for investment banks, keeping in mind their involvement in trading operations and complex financial transactions, this risk can be vulnerable to market conditions and liquidity constraints. A simple way to measure liquidity risk is:

Liquidity Gap=Liquid Assets-Short Term Liabilities

- If liquidity gap > 0, the bank has more liquid assets than short-term obligations (low liquidity risk).
- If liquidity gap < 0, the bank may struggle to meet obligations (high liquidity risk).

Investment banks require a robust buffer of high-quality liquid assets (HQLA) to manage liquidity risk effectively, these mentioned assets, which typically include government securities and cash reserves, can be quickly and easily converted into cash to meet urgent financial needs. The composition and adequacy of HQLA are critical to ensuring that banks can withstand periods of financial stress and avoid funding shortfalls (Ihrig et al., 2019).

To align the maturities and liquidity profiles of their assets and liabilities, investment banks leverage other approaches such as the asset-liability management (ALM) strategies. This involves using financial instruments like the repurchase agreements (repos) and the commercial paper to manage short-term funding needs and ensure liquidity. To conclude, ALM helps banks optimize their liquidity positions by balancing the inflows and outflows of cash.

Besides, supervision and regulation frameworks such as the Basel III liquidity standards have introduced provisions that enhance banks' resilience to liquidity shocks. The Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR) are two of the most significant components of these standards, which require banks to maintain sufficient HQLA to cover net cash outflows over a 30-day stress period and stable funding over a one-year horizon, respectively. These regulations aim to lower systemic liquidity risk and promote financial system stability (Reinhardt et al., 2023).

The LCR is designed to ensure that a bank holds enough high-quality liquid assets (HQLA) to cover its total net cash outflows over a 30-day stress period. The formula is:

$$LCR = \frac{High\ Quality\ Liquid\ Assets}{Total\ Net\ Cash\ Outflows\ (30\ days)}$$

A minimum LCR of 100% means that the bank has enough liquid assets to cover its net cash outflows for 30 days under stressed conditions.

The NSFR aims to promote longer-term resilience by requiring banks to maintain a stable funding profile in relation to the composition of their assets and off-balance sheet activities. The formula is:

$$NSFR = \frac{Available\ Stable\ Funding\ (ASF)}{Required\ Stable\ Funding\ (RSF)}$$

A minimum NSFR of 100% indicates that a bank has sufficient stable funding to support its assets over a one-year horizon

Investment banks must also diversify their sources of finance to reduce reliance on a single source of finance. This diversification includes accessing capital markets, obtaining lines of credit from other financial institutions, and maintaining good relationships with a broad investor base. With several sources of liquidity, banks can cope with periods of market dislocation and maintain business continuity (Ruozi & Ferrari, 2013).

As a whole, managing liquidity risk is a sophisticated process that must be struck through the use of possessing quality liquid funds, employing asset-liability management techniques, following regulatory guidelines, and funding base diversification. These methods enable investment banks to effectively manage liquidity risk and provide financial stability irrespective of changing market conditions.

Operational rish is an important focus area for investment banks, as there is potential for significant financial and reputational impacts resulting from inadequate or failed internal processes, systems, personnel or external events. The complexity of investment banking operations requires a robust risk management framework to effectively manage these risks.

The management of the operational risk involves a comprehensive approach that includes both qualitative and quantitative assessment tools. According to Anderson et al. (2012) argue that investment banks should assess their operational risk exposures by integrating risk identification, measurement and control processes into their overall risk management strategy. This approach helps in visualizing operational risk mechanisms and designing regulatory frameworks that can mitigate these risks (Anderson et al., 2012).

The Internal control system has a vital role in managing operational risks. These systems comprise policies and procedures, segregation of duties, access controls, and regular audits to ensure compliance with regulatory standards. McNulty and Akhigbe (2017) emphasize that a strong internal control system is essential to identify and mitigate operational risks, thereby safeguarding the financial stability and performance of the bank (McNulty and Akhigbe, 2017).

Technological innovation is another important factor that affects operational risk management. Hu et al. (2024) examine how technological advancements can reduce and introduce new operational risks to banks. The introduction of advanced IT solutions and data-driven risk management tools can improve banks' ability to monitor and respond effectively to operational risks (Hu et al., 2024). Furthermore, regulatory requirements, such as those outlined in the Basel Accords, mandate that investment banks maintain robust operational risk man-

agement practices. These regulations require banks to allocate capital for operational risk and report their risk exposures to regulatory bodies, ensuring that banks maintain the integrity of their operations and protect against potential financial losses (Wang et al., 2018).

GAPS IN EXISTING LITERATURE

Several studies have shown that banks may not be able to adequately address all risks with the capital adequacy ratios and buffers set by central banks. The complex relationship between capital requirements and bank liquidity management is highlighted in the study realized by Andersen and Juelsrud's on the optimal capital adequacy ratio. This highlights that while the capital adequacy ratio is an important regulatory tool to ensure that banks have sufficient capital to cover potential losses, it does not by itself address all risks related to banks' liquidity. The study highlights that liquidity problems, especially during financial crises, can exacerbate solvency problems, as banks with inadequate liquidity find it difficult to meet their shortterm obligations. They suggest that the regulatory framework should include a capital adequacy ratio as well as micro-liquidity measures to ensure that banks are prepared to absorb losses while managing unexpected liquidity pressures. The study highlights the systemic risks associated with liquidity shortages, which can lead to macroeconomic instability if banks experience liquidity crises. To better prepare banks for future financial disruptions, it recommends that regulators and policymakers prioritize liquidity management processes and incorporate liquidity-specific challenges into scenario planning and stress testing. Research shows that banks with strong liquidity management processes are more resilient to market volatility or economic downturns. Overall, Andersen and Juelsrud's research provides a compelling case for reassessing the traditional focus on capital adequacy by integrating liquidity management into the regulatory framework, in addition to a holistic approach to banking regulation that recognizes the complex relationship between capital and liquidity in maintaining financial stability (Andersen and Juelsrud, 2024).

Bank Solvency Risk and Funding Costs: The study by Aldasoro et al. explores the intricate relationship between bank solvency risk and funding costs*, highlighting that regulatory capital ratios, while essential, may not fully capture the dynamic and multifaceted nature of funding costs, which can significantly exacerbate solvency risks. This research, using data from Korean banks, shows that funding costs are not constant and can fluctuate depending on different market conditions and bank-specific factors, which affects the overall financial stability of the bank. The authors emphasize that solvency risk is closely related to funding costs, as high funding costs can erode a bank's profitability and capital reserves, increasing the risk of failure. This neglect can lead to an inaccurate assessment of the bank's actual solvency position, as the interaction between solvency risk and funding costs can create a feedback loop, where higher costs increase risk, which further increases funding costs. The study suggests that banks should adopt more comprehensive risk management strategies that consider potential fluctuations in funding costs, as well as maintain strong capital buffers. This approach would involve closely monitoring market conditions, employing stress tests that factor in funding cost fluctuations, and developing contingency plans for periods of elevated funding pressures. By doing so, banks can better anticipate and mitigate the risks associated with funding cost variability, thereby enhancing their overall resilience and stability in the face of financial uncertainties (Aldasoro et al., 2022).

Capital Shortfall Identification: the study realized by Tsagkarakis et al. delve deeper into the complexities of identifying bank capital shortfalls, arguing that traditional capital adequacy measures alone are not able to adequately protect against potential financial vulnerabilities. They propose the development and implementation of a multi-criteria decision support system (MCDSS) to better identify and manage risks associated with weak banks. This sophisticated system will integrate various financial indicators and qualitative factors to provide a more comprehensive assessment of a bank's health. The authors highlight that conventional metrics, like the capital adequacy ratio, frequently only consider quantitative indicators of capital reserves while ignoring other crucial factors like operational risks, market conditions, and management caliber. By incorporating multiple criteria, MCDSS can provide a deeper understanding of a bank's risk exposure, enabling more accurate prediction of capital shortfalls. By using this technology, banks can proactively identify their vulnerabilities and implement targeted strategies to mitigate risks. To better manage risk, a bank with a low rating might, for example, improve operational effectiveness, diversify its asset portfolio, or fortify corporate governance practices. The authors believe that by utilizing advanced analytics and data-driven insights, banks may transcend a uniform paradigm of risk assessment. This tailored approach ensures that banks are more resilient to economic shocks and market volatility, ultimately contributing to greater financial stability in the banking sector. Furthermore, the introduction of such systems can assist regulators in their supervisory role by providing them with detailed information on the systemic risks posed by individual banks (Tsagkarakis et al., 2021).

Solvency Regulations and Risk Management: Rochette's research provides a critical analysis of the limitations of relying solely on solvency regulation to prevent bank failures, emphasizing the need for a comprehensive approach to risk management that can effectively address both unexpected events and systemic risks. Solvency regulation generally aims to ensure that banks maintain a certain level of capital buffer to absorb potential losses, thereby safeguarding their solvency. However, Rochette argues that these regulations, while necessary, do not sufficiently take into account the unpredictability of financial markets and the complex web of relationships between banks and other financial institutions. A major limitation of solvency regulation is its retrospective nature; they are based mainly on historical data and past financial crises. This backward-looking approach can leave banks vulnerable to new types of risks that may arise due to changes in market dynamics, technological developments or geopolitical events. Rochet suggests that banks should adopt a forward-looking risk management practice that

^{*} Funding cost refers to the expenses a bank or financial institution incurs to obtain the funds necessary to lend or invest. This can include interest payments on deposits or borrowed funds, fees associated with acquiring loans or other financial instruments, and any other costs related to securing capital.

includes stress testing and scenario analysis to anticipate and prepare for potential challenges. Furthermore, solvency regulation often fails to address systemic risks arising from the interconnectedness of financial institutions. The failure of one bank can trigger a domino effect, leading to widespread instability in the financial system. Rochet highlights the importance of implementing risk management frameworks that consider the systemic impacts of individual bank actions, facilitating cooperation and information sharing between banks to mitigate these risks. By integrating comprehensive risk management practices with existing solvency regulation, banks can increase their resilience to internal and external shocks. This approach involves not only maintaining adequate capital buffers, but also developing liquidity management, operational risk assessment and governance structures. In addition, Rochette advocates for the ongoing training and development of bank employees to ensure that they are equipped to effectively identify and respond to emerging risks. In conclusion, while solvency regulations are an important element of financial supervision, Rochet's research highlights that these need to be complemented by robust, adaptive risk management strategies that can adapt to the changing financial environment and address the diversity of risks in the banking sector (Rochet, 1999).

Conclusion

Solvency capital plays a critical role in ensuring financial stability and operating integrity of investment banks. Tracking its historical development, this article has pointed out the growing role of regulatory mechanisms in sustaining financial resilience. Solvency capital is not only a buffer against loss but also a basis for investor confidence and systemic stability. With the diverse and complex risk environment under which investment banks must operate, ranging from market and credit risks to operational and liquidity concerns, maintaining adequate solvency capital is of utmost importance. Understanding these dynamics properly is imperative for both practitioners and regulators to be able to anticipate vulnerabilities and ensure long-term stability within the investment banking sector.

REFERENCES

- ALDASORO, I.-CHO, C.H. AND PARK, K. (2022): Bank solvency risk and funding cost interactions: Evidence from Korea. *Journal of Banking & Finance*, 134, p.106348. DOI: 10.1016/j.jbankfin.2021.106348
- ANDERSEN, H. AND JUELSRUD, R. (2023): Optimal capital adequacy ratios for banks. *Latin American Journal of Central Banking*, 5(2), pp.100107–100107. https://doi.org/10.1016/j. latcb.2023.100107
- ANDERSEN, L.B.-HÄGER, D.-MABERG, S.-NÆSS, M.B. AND TUNGLAND, M. (2012): The financial crisis in an operational risk management context—A review of causes and influencing factors. *Reliability Engineering & System Safety*, 105, pp.3–12. https://doi.org/10.1016/j.ress.2011.09.005
- BINDSEIL, U.-MANZANARES, A. AND WELLER, B. (2004): *The Role of Central Bank Capital Revisited.* [online] papers.ssrn. com.
- BITAR, M. AND TARAZI, A. (2022): A note on regulatory responses to COVID-19 pandemic: Balancing banks' solvency and contribution to recovery. *Journal of Financial Stability*, 60, p.101009. DOI: 10.1016/j.jfs.2022.101009

- BROLL, U.-WONG, W.-K. AND WU, M. (2011): Banking Firm, Risk of Investment and Derivatives. *Technology and Investment*, 02(03), pp.222–227 doi: 10.4236/ti.2011.23023.
- CUMMINGS, J.R. AND DURRANI, K.J. (2016): Effect of the Basel Accord capital requirements on the loan-loss provisioning practices of Australian banks. *Journal of Banking & Finance*, 67, pp.23–36. http://dx.doi.org/10.2139/ssrn.2396384
- DERMINE, J. (2015): Basel III leverage ratio requirement and the probability of bank runs. *Journal of Banking & Finance*, 53, pp.266–277. https://doi.org/10.1016/j.jbankfin.2014.12.007
- DU, B. (2017): How Useful Is Basel III's Liquidity Coverage Ratio? Evidence From US Bank Holding Companies. *European Financial Management*, 23(5), pp.902–919.
- FLANNERY, M.J. AND GIACOMINI, E. (2015): Maintaining adequate bank capital: An empirical analysis of the supervision of European banks. *Journal of Banking & Finance*, 59, pp.236–249. DOI: 10.1016/j.jbankfin.2015.06.008
- GATZERT, N. AND WESKER, H. (2012): A Comparative Assessment of Basel II/III and Solvency II. *The Geneva Papers on Risk and Insurance Issues and Practice*, [online] 37(3), pp.539–570.
- GOBAT, J.-YANASE, M. AND MALONEY, J. (2014): The Net Stable Funding Ratio: Impact and Issues for Consideration. *IMF Working Papers*, 14(106), p.1.
- HARTLAGE, A.W. (2012): The Basel III Liquidity Coverage Ratio and Financial Stability. *Michigan Law Review*, [online] 111, p.453.
- HU, M.-ZHANG, Y.-FENG, X. AND XIONG, X. (2024): How technological innovation influence operational risk: Evidence from banks in China. *International Review of Financial Analysis*, [online] 95, p.103480.
- IHRIG, J.-KIM, E.-VOJTECH, C.M. AND WEINBACH, G.C. (2019): How Have Banks Been Managing the Composition of High-Quality Liquid Assets? *Review*, 101(3). https://doi.org/10.20955/r.101.177-201
- INSTEFJORD, N. (2005): Risk and hedging: Do credit derivatives increase bank risk? *Journal of Banking & Finance*, 29(2), pp.333–345. DOI:10.1016/j.jbankfin.2004.05.008
- JACQUES, K.T. (2008): Capital shocks, bank asset allocation, and the revised Basel Accord. *Review of Financial Economics*, 17(2), pp.79–91. https://doi.org/10.1016/j.rfe.2007.03.003
- KHOKHLOVA, G. AND YUSHINA, Y. (2019): Risk management of credit institutions as a factor of investment activity development. *IOP Conference Series: Materials Science and Engineering*, 667(1), p.012039. DOI: 10.2991/aebmr.k.200312.223
- KING, M.R. (2013): The Basel III Net Stable Funding Ratio and bank net interest margins. *Journal of Banking & Finance*, 37(11), pp.4144–4156. DOI: 10.1016/j.jbankfin.2013.07.017
- KING, P. AND TARBERT, H. (2011): *Basel III: an Overview*. [online] Aspen Publishers.
- MAJKA, M. (2024): Market Risk Analysis in Investment Risk Management. [online] Researchgate.
- MCALEER, M.-JIMENEZ-MARTIN, J.-A. AND PEREZ-AM-ARAL, T. (2013): GFC-robust risk management strategies under the Basel Accord. *International Review of Economics & Finance*, 27, pp.97–111. https://doi.org/10.1016/j.iref.2012.09.006
- MCNULTY, J.E. AND AKHIGBE, A. (2017): What do a bank's legal expenses reveal about its internal controls and oper-

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- ational risk? *Journal of Financial Stability*, 30, pp.181–191. https://doi.org/10.1016/j.jfs.2016.10.001
- MENGLE, D. (2007): Credit Derivatives: An Overview FEDERAL RESER VE BANK OF ATLANTA.
- MINTON, B.A.-STULZ, R. AND WILLIAMSON, R. (2008): How Much Do Banks Use Credit Derivatives to Hedge Loans? *Journal of Financial Services Research*, 35(1), pp.1–31. DOI: 10.1007/s10693-008-0046-3
- NICOLAIDES, M.-RUDIN, S.-WATSON, R. AND HARTWIG, K. (2012): Regulatory Issues and Solvency Capital Requirements. pp.341–362.
- OJO, M. (2015): Implementing Basel III through the Capital Requirements Directive (CRD) IV: leverage ratios and capital adequacy requirements Munich Personal RePEc Archive. *Uni-muenchen.de*.
- PAPADAMOU, S.—SOGIAKAS, D.—SOGIAKAS, V. AND TOU-DAS, K. (2021): The prudential role of Basel III liquidity provisions towards financial stability. *Journal of Forecasting*.
- PODOABĂ, L. (2015): An Empirical Research Regarding Density and Penetration Insurance on Accident & Health Premiums in Future Implementation of Solvency II. *Procedia Economics and Finance*, [online] 32, pp.1517–1524. doi: 10.1016/S2212-5671(15)01539-7
- REICHERT, A. AND SHYU, Y.-W. (2003): Derivative activities and the risk of international banks: A market index and VaR approach. *International Review of Financial Analysis*, 12(5), pp.489–511. DOI:10.1016/S1057-5219(03)00061-9
- REINHARDT, D.-REYNOLDS, S.E.-SOWERBUTTS, R. AND CARLOS VAN HOMBEECK (2023): Quality is our asset: The international transmission of liquidity regula-

- tion. *Journal of Banking and Finance*, 154, pp.106919–106919. https://doi.org/10.1016/j.jbankfin.2023.106919
- ROCHET, J.-C. (1999): Solvency regulations and the management of banking risks. *European Economic Review*, 43(4-6), pp.981–990. https://doi.org/10.1016/S0014-2921(98)00109-3
- RUOZI, R. AND FERRARI, P. (2013): Liquidity Risk Management in Banks: Economic and Regulatory Issues. *Liquidity Risk Management in Banks*, pp.1–54. DOI:10.1007/978-3-642-29581-2_1
- TSAGKARAKIS, M.-P.-DOUMPOS, M. AND PASIOURAS, F. (2021): Capital shortfall: A multicriteria decision support system for the identification of weak banks. *Decision Support Systems*, 145, p.113526. DOI:10.1016/j.dss.2021.113526
- VASIU, D.E. AND GHEORGHE, I. (2014): Case Study Regarding Solvency Analysis, during 2006-2012, of the Companies having the Business Line in Industry and Construction, Listed and Traded on the Bucharest Stock Exchange. *Procedia Economics and Finance*, 16, pp.258–269 https://doi.org/10.1016/S2212-5671(14)00799-0
- WANG, Y.-LI, G.-LI, J. AND ZHU, X. (2018): Comprehensive identification of operational risk factors based on textual risk disclosures. *Procedia Computer Science*, 139, pp.136–143. DOI:10.1016/j.procs.2018.10.229
- WITZANY, J. (2017): Credit Risk Management. *Credit Risk Management*, pp.5–18. DOI:10.1007/978-3-319-49800-3 ISBN: 978-3-319-49799-0
- WYMEERSCH, E. (2011): Europe's New Financial Regulatory Bodies. *Journal of Corporate Law Studies*, 11(2), pp.443–462. http://dx.doi.org/10.2139/ssrn.1813811