

Stress-testing the non-financial companies' sector

Florin George Dragu¹

¹⁾ Bucharest University of Economic Studies, Bucharest, Romania.

E-mail: florin.dragu@gmail.com

Please cite this paper as:

Dragu, F.G., 2024. Stress-testing the non-financial companies' sector. In: R. Pamfilie, V. Dinu, C. Vasiliu, D. Pleșea, L. Tăchiciu eds. 2024. *10th BASIQ International Conference on New Trends in Sustainable Business and Consumption*. Almeria, Spain, 6-8 June 2024. Bucharest: Editura ASE, pp. 172-180

DOI: 10.24818/BASIQ/2024/10/080

Abstract

Stress-testing the non-financial sector is crucial due to firms' central economic role, spanning industries and driving growth through goods, services, and job creation. Rigorous tests assess resilience to adverse scenarios, especially important amid converging crises. The article proposes a comprehensive framework that can be used to assess the resilience of this sector to various adverse scenarios, including economic downturns, supply chain disruptions, and geopolitical tensions. By applying scenario calibration and transmission mechanisms, the article contributes significantly to understanding and managing economic shocks that may affect non-financial firms.

The research method involves a micro stress-testing module that utilizes financial statements from all Romanian companies and loan-level data from 2007 to 2022. This data is used to simulate the financial impacts of various shock scenarios on company balance sheets, offering insights into potential vulnerabilities and resilience of the sector. The scenarios include both negative and positive shocks, allowing for a sensitivity analysis that measures the potential fluctuations in financial indicators such as profitability, liquidity, and solvency under different conditions.

The main results of the study highlight a significant increase in operating revenues and expenses among Romanian non-financial companies over the study period, with detailed scenario analyses indicating how these financial dynamics could evolve under continued economic stress. The results also reveal the potential for reduced financial leverage over time, suggesting an improvement in the financial stability of these firms.

The practical implications of this research are significant for policymakers and financial regulators. First, it can be integrated with a probability of default model, which allows for a forecast of future defaults under various scenarios. Furthermore, by delineating the channels through which shocks are transmitted, the framework proposed in this paper empowers decision-makers to develop and implement targeted strategies that mitigate systemic risks and bolster resilience across sectors.

Keywords

Credit risk, stress test, micro data, scenario analysis, default

DOI: 10.24818/BASIQ/2024/10/080

Introduction

Stress-testing the non-financial sector is critical given its central role in the economy. These firms are fundamental to numerous industries, offering goods and services, creating jobs, and fueling economic expansion. By subjecting this sector to rigorous stress tests, policymakers can assess its resilience to adverse scenarios such as economic downturns, supply chain disruptions, or geopolitical tensions. This has been particularly true amidst the current environment, characterized by a convergence of multiple simultaneous crises. Understanding the vulnerabilities and potential contagion effects within non-financial companies is essential for safeguarding financial stability, preserving jobs, and maintaining overall economic health. Additionally, stress-testing helps identify areas requiring targeted support or regulatory intervention, ensuring that the sector remains robust and adaptable to evolving challenges in an increasingly interconnected global landscape.

This study contributes to the existing body of literature on stress testing, which predominantly centers on the financial sector, by extending and laying the foundational framework for stress testing within the non-financial sector as well. In the banking sector, stress testing has proven its efficacy in identifying vulnerabilities and enhancing systemic resilience. For instance, Vodenska et al. (2021) have shown the utility of stress tests in assessing and mitigating risks within financial sectors. Furthermore, Kok et al. (2021) found that banks subjected to the 2016 EU-wide stress test reduced their credit risk more significantly than those not stress-tested, underlining the tests' disciplining effect. Similarly, Georgescu O. et al. (2017) demonstrated that stress tests provide new market information, impacting banks' funding costs and stock prices, and affecting sovereign funding costs. These findings point to the potential benefits of applying similar methodologies to non-financial sectors, a gap in current research that this paper aims to address.

In addition, Georgescu O. et al. (2017) investigate the impact of the 2014 and 2016 European stress tests on banks' funding costs, stock prices, and sovereign funding costs, aiming to determine their informational value to the market. Results show that stress tests indeed provide new market information, influencing funding costs and stock prices. Three hypotheses were tested: whether stress tests reveal new information about banks, improve market discrimination between strong and weak banks, and affect sovereign funding costs of banks under scrutiny. They also enhance market discrimination between banks based on stress test performance and affect sovereign funding costs.

In Romania, non-financial companies face persistent structural vulnerabilities, including a notably low level of financial intermediation and insufficient firm capitalization. The prevalence of undercapitalized firms (Georgescu F., 2018), which significantly restricts their access to funding sources, hampers investment opportunities, undermines productivity, and hinders efficient resource allocation within the economy. Given these challenges, conducting stress testing exercises on non-financial companies becomes crucial for identifying additional vulnerabilities and addressing them effectively.

Traversing the intricate landscape of economic shocks and their cascading effects within the economy, it becomes increasingly evident that the significance of scenario calibration and transmission mechanisms cannot be overstressed (Parlatore and Philippon, 2022).

The framework proposed in this paper brings forward a tool to better navigate the multifaceted interaction between various shock types and transmission modalities, offering options to bolster resilient risk management strategies and to craft agile policy responses. Given the dynamic features of economic turbulences, the efficacy of scenario calibration and adequate assessment of the transmission channels serves as a cornerstone for accurately anticipating and preparing for potential disruptions (Bank of England, 2022). By examining diverse shock types—including fluctuations in revenues, expenses, and asset valuations—decision-makers can attain a comprehensive understanding of the intricate vulnerabilities that may permeate financial ecosystems.

Moreover, the transmission of shocks across the companies' sector introduces an additional layer of complexity. Whether shocks are disseminated uniformly across all firms, or if they exhibit asymmetrical patterns based on factors such as size or industry sector, the manner in which they propagate can significantly impact systemic stability. By discerning these transmission dynamics, policymakers can refine their interventions, ensuring that resources are allocated efficiently to mitigate systemic risks and support the resilience of key sectors.

By integrating insights from scenario calibration with an understanding of how shocks propagate through the financial ecosystem, stakeholders can develop nuanced strategies that address vulnerabilities at both micro and macro levels. This integrated approach empowers decision-makers to deploy targeted interventions that enhance the overall resilience of financial systems, fostering sustainable economic growth and stability.

The results of this study advance our understanding of how non-financial firms can manage economic shocks. Firms with robust profitability are better equipped to service their bank debts, consequently showing a lower probability of loan default. This aligns with prior research and underscores the importance of profitability, liquidity, and controlled indebtedness as critical factors in maintaining financial stability. The findings also highlight the effectiveness of the stress-testing framework applied to non-financial sectors, suggesting that similar strategic assessments can be beneficial in mitigating financial risks and enhancing overall economic resilience.

Future research could extend these findings by conducting longitudinal studies to assess the long-term impacts of stress-testing based interventions, providing a richer understanding of their effectiveness. By building on the previous literature, this paper contributes novel insights into the resilience of non-financial sectors, by providing a tool to assess firms' capacity to withstand economic shocks

The remainder of the paper is structured as follows. The second section details the data and introduces the methodology used to develop the scenario assessment and stress test for non-financial companies. The third section presents the results obtained, while the final chapter concludes the main ideas from the paper.

1. Data and methodology

The study employs a quantitative and data-driven research method using a micro stress-testing module that leverages financial statements and loan-level data collected from Romanian companies between 2007 and 2022. This approach allows for detailed simulations of how various shock scenarios—both negative and positive—affect firms' balance sheets. These simulations can be used to uncover potential vulnerabilities within the sector and assessing its resilience. Through this method, the research conducts a sensitivity analysis to explore potential fluctuations in key financial indicators, such as profitability, liquidity, and solvency, under different economic conditions. This methodological approach can provide robust insights into the financial dynamics, resilience and stability of the sector.

As previously alluded to, the proposed framework serves to better disentangle the interplay between different shock types and transmission mechanisms. By offering a comprehensive examination of these dynamics, the tool facilitates a more precise calibration of scenarios and a deeper understanding of how various shocks propagate throughout the economy.

Economic shocks manifest in diverse forms, ranging from sudden demand shifts to regulatory changes, and can significantly impact non-financial companies through various channels. These shocks may emanate from global economic trends, supply chain disruptions, or geopolitical tensions, underscoring the multifaceted nature of their potential effects on businesses. These shocks possess the ability to penetrate firms' balance sheets through diverse avenues, resulting in possible decreased revenues, increased expenses, depreciation of asset values, or a combination of these elements. Then, the negative effects can further propagate throughout sectors, generating operational hurdles, liquidity constraints, and elevated risk levels.

Therefore, the first aspect of the proposed framework is associated with the type of shock capable of impacting a company.

Within revenue dynamics, fluctuations in income streams stem from various sources, including shifts in demand patterns, changes in consumer behavior, market volatility, industry-wide transformations, and adjustments in regulatory frameworks. These variations in revenue constitute a fundamental type of shock, exerting significant influence on a company's financial health and operational stability.

On the expenses' side, a multitude of shocks can disrupt companies' operations as well. These include not only increased operational costs and heightened debt servicing obligations due to rising interest rates, but also shifts in cost structures, vulnerabilities in supply chains, possible effects of climate risks and fluctuations in macroeconomic trends. Such disruptions can pose significant challenges to firms, impacting their profitability, liquidity, and overall financial health.

An additional avenue for risk transmission lies within the asset domain. Assets, spanning from liquid investments to tangible resources, are vulnerable to various shocks arising from market volatility, credit risk, extreme weather events, or geopolitical tensions. Furthermore, the ongoing transition towards a greener economy introduces the risk of significant increases in stranded assets, as shifts in energy production methods and environmental regulations, coupled with a change in consumer expectations, reshape the valuation landscape. These factors collectively underscore the importance of assessing and managing risks associated with asset valuation.

Acknowledging the intricate interdependence among revenue, expense, and asset dynamics, scenario calibration for combined shocks offers a holistic perspective on systemic vulnerabilities and resilience. Synthesizing multiple shock scenarios enables stakeholders to grasp the cumulative impact and devise integrated risk mitigation strategies.

In addition to evaluating shocks, it is important to analyze transmission channels, as diverse shocks may exert unique impacts on non-financial companies. This paper delves into several transmission channels that

facilitate the propagation of shocks within the sector, elucidating the mechanisms through which disruptions can affect companies.

Shocks may be uniformly distributed across all firms in certain scenarios, while in others, they may manifest asymmetrically, influenced by factors such as the size or industry sector of the companies. Understanding these patterns is crucial for policymakers, enabling them to tailor interventions effectively and allocate resources where they are most needed, ensuring the resilience of both individual firms and the broader economy against systemic risks.

In a scenario where the transmission is uniform to all firms, shock impacts are uniformly distributed across all companies within the NFC sector. While offering simplicity and ease of implementation, this approach may overlook inherent variations in risk exposure and resilience levels, potentially leading to misallocation of resources and systemic inefficiencies.

In addition, customizing the transmission of shocks according to the size of firms enables a tailored approach that matches companies' diverse risk profiles and systemic relevance. This ensures that larger entities, due to their significant impact on the system, are equipped to absorb shocks that may disproportionately affect them, while smaller businesses benefit from specific assistance aimed at addressing vulnerabilities and maintaining overall financial stability.

Furthermore, recognizing the varied nature of economic sectors, this mechanism can accommodate the transmission of shocks to match the specific dynamics and vulnerabilities within each industry. This approach could be particularly useful in situations like the challenges posed by the pandemic or the energy crisis. Industries experiencing significant disruptions, such as hospitality or tourism, may benefit from customized measures to mitigate adverse impacts and foster sectoral recovery.

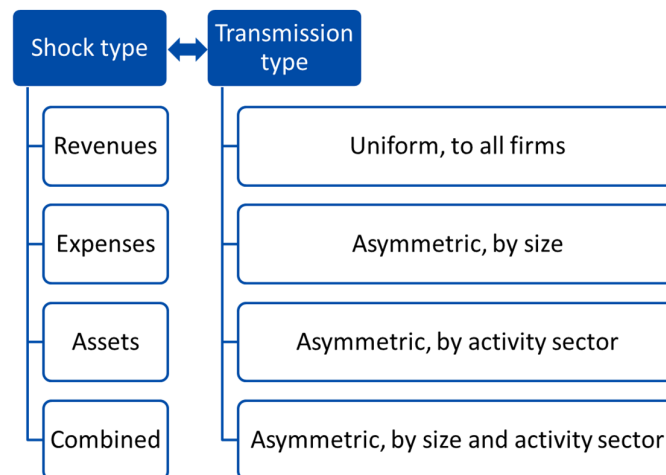


Figure no. 1. Shocks and transmission channels

Source: author's calculations

Finally, taking into account interlinkages between firm size and activity sectors can ensure a more comprehensive understanding of how shocks propagate across the economy. As such, by integrating firm size and sectoral factors, this transmission strategy can enhance the proposed framework by better capturing systemic risks and vulnerabilities. By implementing such a strategy, regulators can effectively analyze and manage systemic risks while fostering resilience across the spectrum of businesses.

Therefore, this paper brings forward a flexible mechanism that can be adapted to the specific type of shock to be analyzed, while also allowing for different transmission channels (figure no. 1).

Scenario calibration and transmission channels can draw from diverse sources such as macro forecasts, industry analyses, historical data, and news reports. These inputs generate scenarios focusing on key variables like revenues, expenses, and assets. Subsequently, these scenarios are integrated into firms' balance sheets and income statements via the profit and loss account and the equity channel. This integration then entails adjustments also to total assets or total debt, ensuring equilibrium in the balance sheet equation (figure no. 2).

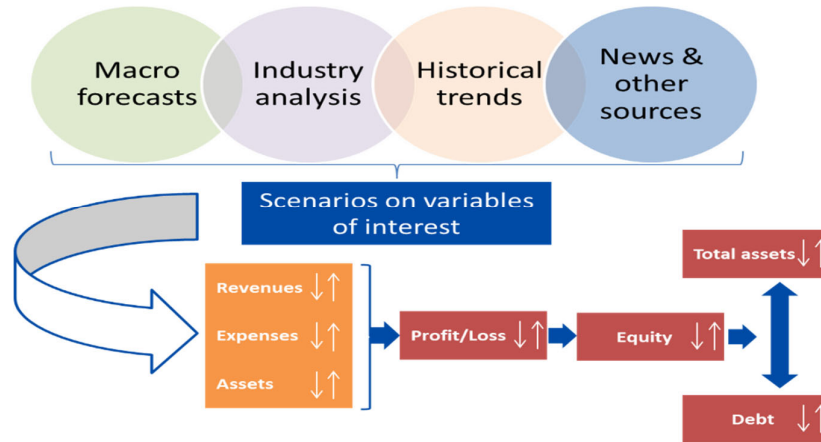


Figure no. 2. Scenario calibration and balance sheet transmission channels
Source: author's calculations

The micro stress testing module relies on a dataset constructed from the financial statements of every Romanian firm and loan-level data sourced from the Credit Registry, spanning the period from 2007 to 2022. Data is collected annually, offering a detailed view of the financial activities of these firms throughout the specified time span.

2. Results

For the purpose of this paper, the micro-stress testing module undergoes testing with a scenario closely resembling the conditions experienced during the financial crisis of 2008-2009. This negative scenario replicates the systemic shocks and stressors encountered during that period, providing a rigorous assessment of the module's efficacy in predicting and mitigating potential risks. This is will form the negative scenario (figure no. 3). In order to compute the sensitivities in a positive scenario as well, the reverse of the crisis scenario is considered.

Utilizing this framework, a range of new financial indicators across different scenarios can be generated, offering valuable insights into potential pathways for firms' financial positions. These indicators encompass metrics related to profitability, solvency, and liquidity, providing a comprehensive assessment of a firm's financial health under various conditions. By analyzing these indicators, stakeholders can gain a deeper understanding of how different scenarios may impact a firm's performance and resilience. This analytical approach enables proactive decision-making, allowing firms to identify and address vulnerabilities, optimize resource allocation, and bolster their overall financial stability in an ever-evolving economic landscape.

	2009/2008		
	Total sales	Total operating expenses	Total assets
Total companies	-13.2%	-12.0%	-2.2%
	By size		
	Total sales	Total operating expenses	Total assets
Large corporates	-13.6%	-13.1%	-8.2%
SMEs	-12.8%	-11.2%	3.1%
	By sector		
	Total sales	Total operating expenses	Total assets
Agriculture	3.9%	2.0%	21.3%
Mining and quarrying	-21.5%	-20.9%	8.0%
Manufacturing	-17.0%	-16.4%	-5.0%
Utilities	-5.6%	-6.0%	9.0%
Construction	-22.6%	-23.3%	-5.4%
Trade	-11.8%	-10.1%	0.8%
Services	-10.5%	-6.9%	-14.1%
Real estate	1.2%	-8.0%	3.7%

Figure no. 3. Main variables in the crisis scenario
Source: MoF, NBR, author's calculations

There has been a significant increase in operating revenues of Romanian non-financial companies from 2007 to 2022, with a growth rate of approximately 217%. The sensitivity analysis shows potential revenue

fluctuations for the next year between 2,072 bln. lei (negative sensitivity) and 2,699 bln. lei (positive sensitivity). Operating expenses have also experienced a substantial increase over the same period, with a growth rate of around 206%. The sensitivity analysis indicates possible expense variations ranging from 2,011 bln. lei to \$2,562 bln. lei in 2023 (figure no. 4).

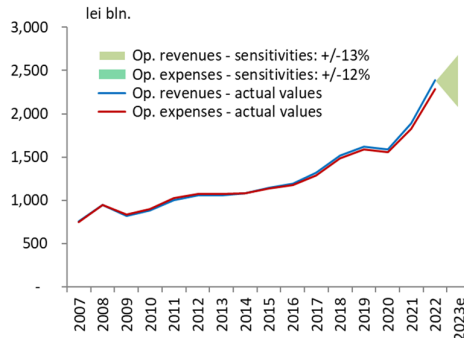


Figure no. 4. Revenues and expenses – sensitivities
Source: MoF, NBR, author's calculations

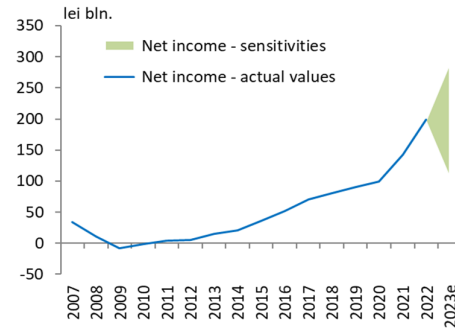


Figure no. 5. Net income – sensitivities
Source: MoF, NBR, author's calculations

This evolution in operating revenues and costs will then translate into the net income of the Romanian companies. Historically, there has been a substantial increase in net income from 2007 to 2022, with a growth rate of approximately 485% (figure no. 5).

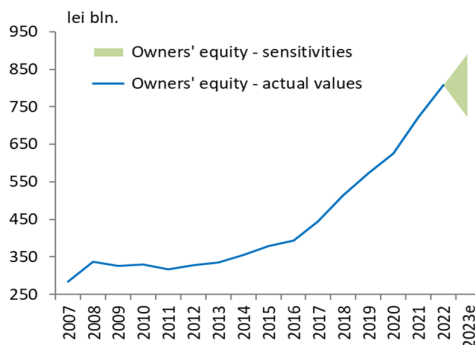


Figure no. 6. Owners' equity – sensitivities
Source: MoF, NBR, author's calculations

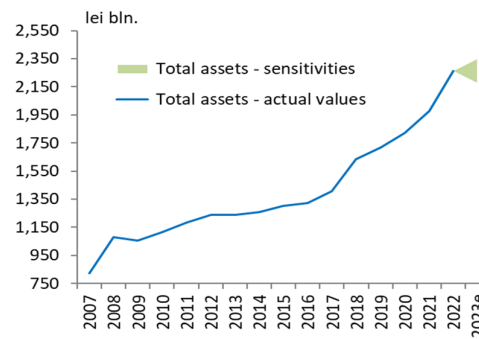


Figure no. 7. Total assets - sensitivities
Source: MoF, NBR, author's calculations

The transmission channel progresses by reflecting the evolution of net income into the equity of firms (figure no. 6). This process involves translating the changes in net income over time into corresponding adjustments in the equity holdings of companies. As net income fluctuates, these variations are mirrored in the equity accounts of firms, influencing their overall financial standing and shareholder value.

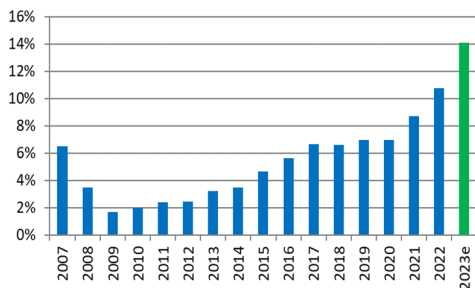


Figure no. 8. Return on assets – positive scenario
Source: MoF, NBR, author's calculations

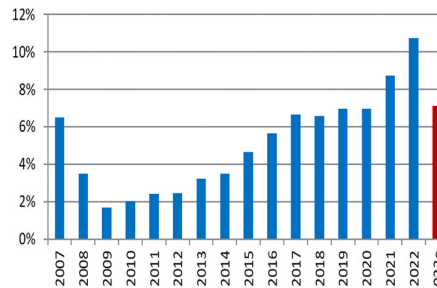


Figure no. 9. Return on assets – negative scenario
Source: MoF, NBR, author's calculations

The last step in the transmission channel must ensure balance sheet equilibrium. As changes in equity occur due to either increases or decreases, firms must adjust either total assets or total debt accordingly to maintain

balance. This adjustment ensures that changes in equity are accurately reflected without disrupting the overall financial equilibrium of the firm's balance sheet. Thus, any alteration in equity necessitates a corresponding adjustment in either assets (figure no. 7) or debt to uphold the financial integrity of the balance sheet.

Based on this new set of financial statements, one can then easily assess the financial position of the non-financial companies' sector, by generating new indicators to gauge the impact of the scenarios.

The Romanian companies' return on assets has shown a consistent upward trend over the years, starting from 6.5% in 2007 and reaching 10.7% in 2022. The ROA indicates the efficiency with which a company is utilizing its assets to generate profits, and the increasing trend suggests improved asset utilization and profitability over time. The micro stress testing framework can be used to generate future pathways of profitability (figures no. 8 and no. 9).

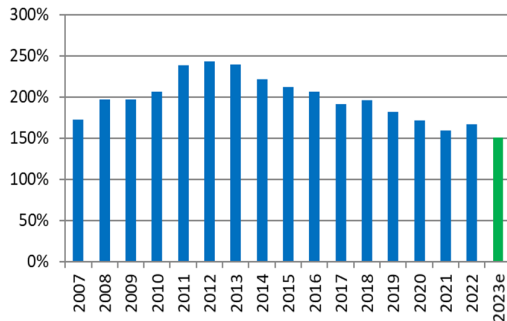


Figure no. 10. Debt to equity – positive scenario
Source: MoF, NBR, author's calculations

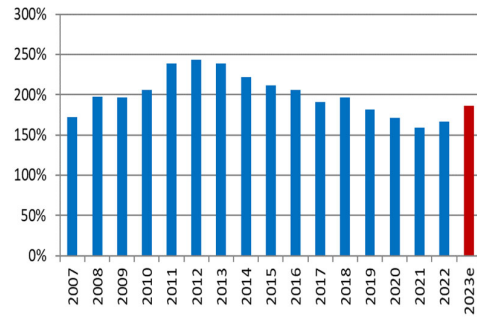


Figure no. 11. Debt to equity – negative scenario
Source: MoF, NBR, author's calculations

The Debt to Equity ratio measures the proportion of a company's debt to its equity, indicating its financial leverage. The D2E ratio has fluctuated over the years, starting at 1.73 in 2007 and declining to 1.67 by 2022. This suggests a reduction in financial leverage over time, as the company's debt decreases relative to its equity. In 2023, the projected D2E ratio under positive scenario is 1.51, while under the adverse scenario, it is 1.86 (figures no. 10 and no. 11).

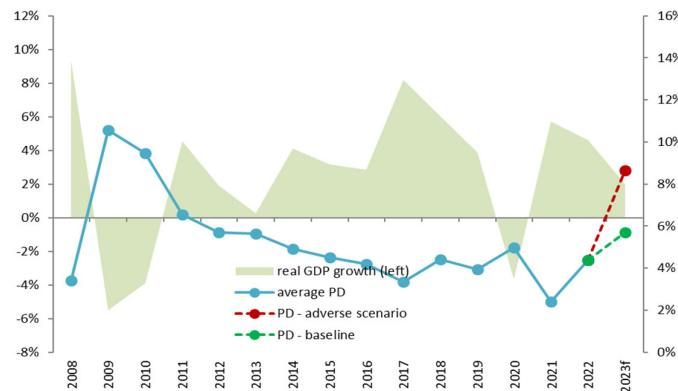


Figure no. 12. Probability of default estimation using the micro stress testing framework
Source: MoF, NBR, author's calculations

In addition to assessment of companies' financial health, these indicators can be incorporated into the estimation of firms' probability of default, enhancing the evaluation of its ability to service debt. By integrating these indicators into the probability of default calculation, creditors gain invaluable insights into the risk associated with their corporate loan portfolios. This comprehensive analysis enables creditors to make informed decisions regarding loan approval, interest rates, and credit limits, while also identifying potential risks and implementing risk mitigation strategies (figures no. 12 and no. 13). The model used to estimate the probability of default follows the methodology outlined by Costeiu and Neagu (2013). The findings indicate that companies with a stronger capacity to generate profits are better positioned to service their bank debt, thereby reducing their likelihood of defaulting on loans. These results align with existing research in the field of credit risk. Nehrebecka (2015) demonstrated that the return on assets is a primary

factor influencing a firm’s ability to service its bank debt. Moreover, other elements such as the level of indebtedness and outstanding debts to other creditors also affect default probabilities. Fidrmuc and Hainz (2010) explored the default rates of SMEs in Slovakia, finding that high indebtedness notably raises the risk of default. Their research also confirmed that liquidity and profitability significantly impact default occurrences. Similarly, Benito et al. (2004) provided evidence that indebtedness and profitability are crucial determinants of default risk.

Rating class	A	A-	BBB+	BBB	BBB-	BB+	BB	BB- (1)	BB- (2)	B+ (1)	B+ (2)	B (1)	B (2)	B- (1)	B- (2)	CCC	DDD
A	1.2%	11.6%	40.9%	43.3%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%
A-	0.3%	1.8%	15.1%	49.5%	31.2%	1.1%	0.3%	0.2%	0.1%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
BBB+	0.1%	0.3%	2.4%	17.4%	48.0%	29.2%	1.2%	0.3%	0.3%	0.2%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%
BBB	0.0%	0.1%	0.4%	3.6%	17.1%	51.7%	23.5%	1.1%	0.2%	0.4%	0.4%	0.5%	0.4%	0.1%	0.1%	0.2%	0.3%
BBB-	0.0%	0.0%	0.2%	0.7%	4.9%	20.0%	50.3%	13.7%	4.5%	1.5%	0.7%	0.5%	0.7%	0.6%	0.5%	0.6%	0.6%
BB+	0.0%	0.0%	0.1%	0.2%	1.5%	6.8%	23.9%	22.9%	19.9%	10.8%	5.0%	2.0%	1.3%	1.1%	1.2%	1.9%	1.3%
BB	0.0%	0.0%	0.0%	0.2%	0.4%	2.9%	8.6%	9.5%	16.9%	19.3%	15.1%	9.2%	4.9%	2.8%	2.3%	5.6%	2.3%
BB- (1)	0.0%	0.0%	0.0%	0.0%	0.2%	1.4%	4.9%	3.7%	6.6%	13.5%	16.9%	15.2%	10.3%	6.1%	3.8%	12.2%	5.2%
BB- (2)	0.0%	0.0%	0.0%	0.0%	0.3%	0.8%	3.9%	3.5%	3.9%	6.8%	13.2%	15.6%	14.5%	10.6%	6.0%	14.3%	6.5%
B+ (1)	0.0%	0.0%	0.1%	0.1%	0.4%	0.6%	2.4%	3.2%	3.7%	3.6%	6.8%	12.5%	15.0%	11.9%	9.1%	21.0%	9.6%
B+ (2)	0.0%	0.0%	0.3%	0.6%	0.7%	1.3%	1.4%	2.8%	3.7%	4.0%	5.3%	7.7%	10.8%	13.0%	12.5%	24.6%	11.2%
B (1)	0.0%	0.0%	0.2%	0.2%	2.5%	3.2%	2.0%	1.6%	3.1%	4.0%	5.3%	6.8%	7.6%	10.6%	11.8%	30.5%	10.7%
B (2)	0.0%	0.2%	0.2%	0.5%	2.5%	7.8%	2.9%	1.3%	5.4%	4.1%	3.8%	4.1%	5.4%	6.9%	9.5%	34.8%	10.8%
B- (1)	0.0%	0.1%	0.3%	0.8%	2.4%	9.7%	10.9%	1.5%	1.2%	1.6%	2.2%	4.8%	3.3%	5.5%	5.5%	36.7%	13.5%
B- (2)	0.0%	0.2%	0.2%	0.7%	2.0%	7.6%	19.1%	6.7%	2.3%	1.5%	2.3%	2.6%	3.2%	3.9%	5.1%	31.7%	10.9%
CCC	0.0%	0.0%	0.0%	0.2%	0.9%	1.8%	5.6%	5.6%	6.4%	6.7%	7.4%	6.6%	5.7%	4.5%	4.3%	23.1%	21.1%
DDD	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.3%	0.5%	0.6%	0.8%	1.1%	2.0%	2.7%	3.8%	4.4%	25.8%	57.7%

Figure no. 13. Transition matrix using the micro stress testing framework

Source: MoF, NBR, author’s calculations

Conclusions

This paper highlights the essential role of stress-testing in maintaining the financial stability and economic resilience of non-financial companies, which are integral to economic growth, job creation, and industry development. By applying stress tests, policymakers can gauge the sector’s ability to withstand various adverse scenarios, such as economic downturns, supply chain disruptions, and geopolitical tensions. This capability is crucial for maintaining strength during difficult periods and adapting to ongoing changes.

The research introduced a detailed framework for scenario calibration and transmission mechanisms, significantly improving our understanding of how economic shocks affect the non-financial sector. Utilizing a combination of macro forecasts and historical data, this framework generates new financial indicators that can offer deeper insights into the financial status of firms. The study of these indicators—including operating revenues, expenses, net income, return on assets, and the debt-to-equity ratio—demonstrates a trend towards increased profitability and decreased financial leverage, indicating enhanced stability and better financial health.

Nevertheless, the study has limitations, chiefly its focus on Romanian non-financial companies, which might not fully represent conditions in other economic environments or regions. Future research could broaden this approach to include various economies and sectors, potentially increasing the model’s relevance and robustness. Further investigations into the long-term effects of consistent stress-testing on sectoral innovation and competitiveness could also yield important insights.

From a policy standpoint, the findings support the need for ongoing and improved stress-testing practices. Regulatory authorities should use these insights to design interventions that protect against systemic risks while addressing the specific needs of different sectors. For creditors, integrating financial health indicators into the probability of default estimations is particularly beneficial, enhancing risk assessment and decision-making processes related to loan approvals and credit management.

In summary, this paper not only confirms the importance of stress-testing for financial stability in the non-financial sector but also enhances our methods for managing and mitigating economic shocks effectively. By tackling both immediate challenges and identifying future research directions, it sets a strong foundation for further improving the resilience and sustainability of this crucial sector.

References

Bank of England (2022) ‘Stress testing the UK banking system: key elements of the 2022/23 annual cyclical scenario’.

Benito, A., Delgado, F.J. and Pages, J.M. (2004) ‘A synthetic indicator of financial pressure for Spanish firms’, Banco de España, Working Paper No. 0411.

- Costeiu, A. and Neagu, F. (2013) 'Bridging the banking sector with the real economy. A financial stability perspective', ECB Working Paper Series, no. 1592, September 2013.
- Fidrmuc, J. and Hainz, C. (2010) 'Default rates in the loan market for SMEs: Evidence from Slovakia', *Economic Systems*, vol. 34, no. 2, pp. 133-147.
- Georgescu, F. (2018) *The Capital in post-communist Romania*. Editura Academiei Române.
- Georgescu, O.-M., Gross, M., Kapp, D. and Kok, C. (2017) 'Do stress tests matter? Evidence from the 2014 and 2016 stress tests', Working Paper Series, No. 2057, May 2017, European Central Bank (ECB).
- Kok, C., Müller, C., Ongena, S. and Pancaro, C. (2021) 'The disciplining effect of supervisory scrutiny in the EU-wide stress test', Working Paper Series, No. 2551, European Central Bank (ECB).
- Nehrebecka, N. (2015) 'Approach to the assessment of credit risk for nonfinancial corporations. Evidence from Poland', Warsaw, Poland, December 14-15.
- Parlatore, C. and Philippon, T. (2022) *Designing Stress Scenarios*, NBER Working Paper No. 29901.
- Vodenska, I., Aoyama, H., Becker, A. P., Fujiwara, Y., Iyetomi, H. and Lungu, E. (2021) 'From stress testing to systemic stress testing: The importance of macroprudential regulation', *Journal of Financial Stability*, vol. 52.