

Evolving Efficiency in Romania's Banking Sector: A Long-Term Assessment of Performance and European Alignment

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Abstract. *This study examines the evolution of banking efficiency in Romania between 2010 and 2023 by employing a comparative assessment of key financial indicators relative to the European Union average. Using official statistical data sourced from Eurostat and World Bank Group, the analysis integrates general expenses relative to assets, the cost-to-income ratio, return on assets (ROA), return on equity (ROE), and the dynamics of non-performing loans (NPLs). A longitudinal methodological approach enables the identification of structural trends, cyclical shifts, and convergence patterns, highlighting critical stages such as the post-crisis adjustment, the consolidation phase, and the accelerated modernization driven by digital transformation. The results show that although Romanian banks initially exhibited weaker operational efficiency and lower profitability compared to the EU, significant improvements have taken place following balance-sheet restructuring, enhanced risk management, and the accelerated adoption of digital technologies. The sharp decline in NPLs and the substantial increase in ROE after 2015 demonstrate a notable strengthening of financial performance. Despite persistent gaps in ROA and cost structures, the Romanian banking sector has shown increasing convergence with European standards. Overall, the study emphasizes the essential role of digitalization, cost optimization, and technological integration in enhancing long-term competitiveness and resilience within the Romanian banking system.*

Keywords: banking efficiency; digital transformation; Romanian banking sector; financial performance; European convergence

JEL Classification: G21, G28, G32

1. Introduction

The efficiency of the banking system is a fundamental condition for economic stability and resilience, especially in emerging economies such as Romania, where the financial sector has undergone a major transformation process over the last two decades (Asmild & Matthews, 2012; Gherțescu et al., 2024). In the literature, banking efficiency is defined as the ability of credit institutions to transform resources into strong financial results while maintaining an adequate level of risk (Battese & Coelli, 1995). Recent studies highlight the role of structural reforms and European convergence in increasing the efficiency of the Romanian banking sector, especially after joining the European Union (Andries & Ursu, 2016). At the same time, research shows that accelerated digitization, the adoption of fintech technologies, and the optimization of operational processes have become important factors in determining banking performance (Vives, 2019). The Romanian banking system underwent

significant reconstruction after the 2008 global financial crisis, which stimulated interest in econometric models for evaluating efficiency, such as DEA and SFA (Chortareas, Girardone & Ventouri, 2013). In addition, regional competitiveness and integration into the European banking market have created additional pressure to improve the efficiency of credit institutions in Romania (Delis, 2012).

The literature shows that traditional performance indicators, such as ROA and ROE, provide limited information, requiring a complex analysis that includes cost efficiency, profit efficiency, and asset quality (Fiordelisi & Molyneux, 2010). Furthermore, the growth of financial intermediation, the digitization of services, and banking consolidation are contributing to the redefinition of efficiency strategies in Central and Eastern Europe (Fungáčová, Solanko & Weill, 2010). In Romania, the modernisation of digital infrastructure and the expansion of electronic banking services have accelerated the process of organisational transformation in most financial institutions (Sava & Lupu, 2021).

Research highlights that banking efficiency is influenced by both internal factors such as bank size, capital structure, and business model, and external factors, such as inflation, GDP growth, and market volatility (Triki & Maktouf, 2020). Comparative analyses at European level indicate that Romanian banks are gradually converging towards the EU average efficiency, although significant structural differences remain (Mihai, 2020). At the same time, efficiency studies show that the high level of non-performing loans has been a major obstacle to achieving optimal efficiency in the post-crisis period (Beck, De Jonghe & Schepens, 2013). Recent developments in the banking sector, marked by digitization, consolidation, and automation, point to a new stage in the analysis of banking efficiency, focused on technology and sustainability (Drigă & Isac, 2014; Manta et al., 2024). Furthermore, research on digital transformation shows that the adoption of artificial intelligence and process automation can have a major impact on productivity and operational efficiency (Barras, 1990; Siminică et al., 2025). Given these developments, the analysis of banking efficiency in Romania becomes essential for understanding how financial institutions are adapting to economic, technological, and institutional changes.

The purpose of this paper is to assess the evolution of the efficiency of the Romanian banking system between 2010 and 2023 by comparing the main operational, profitability, and risk indicators with the European Union average. The paper aims to highlight both convergence and structural transformation trends, as well as the impact of digitalisation and external shocks on banking performance.

2. Materials and methods

The analysis was conducted based on a set of official indicators taken from the Eurostat database and World Bank Group, supplemented with aggregate information from reports by the National Bank of Romania and the European Banking Authority. The data covers the period 2010–2023 and includes comparable series at European level, which allows for the assessment of Romania's position relative to the European Union average. The selected indicators: general expenses relative to assets, cost-to-income ratio, ROA, ROE, and non-performing loan ratio, were processed uniformly to ensure methodological consistency throughout the period.

Annual developments were analyzed using a longitudinal approach, with percentage differences and direct comparisons with European values to identify trends, convergences, and structural divergences. The graphs were created in-house using standard R functions so that the visual interpretations accurately reflect the dynamics of the indicators. The methodology is based on the principles of comparative financial analysis, integrated with a contextual perspective on macroeconomic changes and digital transformations in the banking sector. The analysis looked at both structural

changes and the transitory effects generated by exogenous shocks, with a view to gaining a multidimensional understanding of banking efficiency. This methodological approach highlights the relationship between modernization, operational discipline, and convergence with European standards.

3. Results

Analyzing the performance of Romania's banking sector requires an integrated assessment of operational efficiency, profitability, and risk, through systematic comparison with European standards. The selected indicators; overhead expenses relative to assets, cost-to-income ratio, ROA, ROE, and the evolution of non-performing loans, capture structural dynamics, adaptation to shocks, and the capacity for convergence with the European Union. The approach used tracks both long-term trends and the impact of recent transformations, such as digitization, balance sheet consolidation, and macroeconomic changes. This structure allows for the identification of critical points, progress, and strategic directions necessary for increasing the efficiency of the Romanian banking system.

3.1. General expenses relative to assets

Between 2010 and 2021, Romanian banks recorded higher general expenses relative to assets than the European average. This shows that the operational efficiency of the Romanian banking sector was lower than that of banks in the European Union.

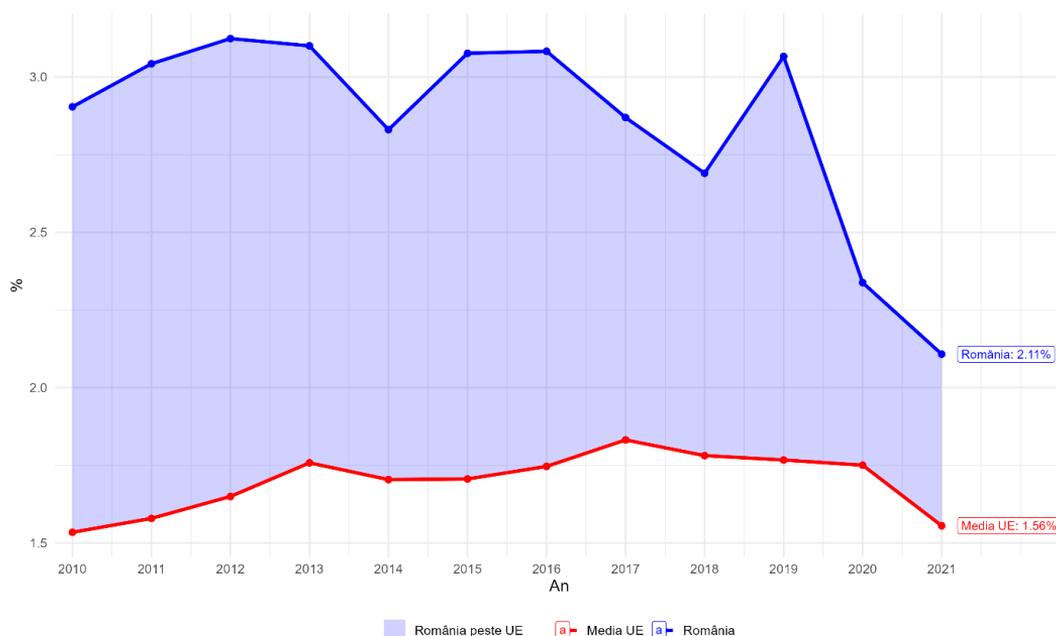


Figure 1. Evolution of general banking expenses relative to total assets (%) in Romania compared to the European Union average (2010–2021)

Source: own processing

In the early years, the indicator remained above 3%. There are two explanations for this. On the one hand, the low quality of assets led to high provisions. On the other hand, the business model was still based on extensive branch networks and high operating costs. The European average remained stable at around 1.5–1.7%, which

accentuated the difference in efficiency.

After 2014, the indicator in Romania began to fluctuate, but without falling significantly below 2.8%. These values reflected a slow restructuring process. Banks began to sell non-performing loan portfolios, reduce staff, and invest in IT systems. However, the gap with the EU remained high.

The major change occurred between 2020 and 2021. Overall costs relative to assets fell to 2.1%. This jump is linked to two phenomena. The first was accelerated digitization, which reduced the need for physical operations. The second was the COVID-19 pandemic, which forced banks to optimize expenses and close low-traffic branches.

In comparison, the European average remained almost unchanged, at around 1.5%. The difference between Romania and the EU narrowed to only 0.5 percentage points. This is the smallest gap in the entire period analyzed.

This development has several implications. First, it confirms that Romanian banks have entered a phase of convergence with European standards. Second, it shows that efficiency can be gained quickly by investing in technology and adapting to new business models. Third, it demonstrates that external shocks, such as the pandemic, can accelerate changes that would otherwise have taken longer.

In the long term, maintaining these gains depends on continued digitization and strict control of expenses. Without these measures, there is a risk that the indicator will remain above the EU average, which would limit the competitiveness of the Romanian banking sector.

3.2. Bank cost-to-income ratio

The bank cost-to-income ratio in Romania has been much more volatile than the European Union average, which has remained relatively stable, between 55% and 61%. This difference in stability highlights the efficiency gaps and different adaptation capacities of Romanian banks compared to their European counterparts.

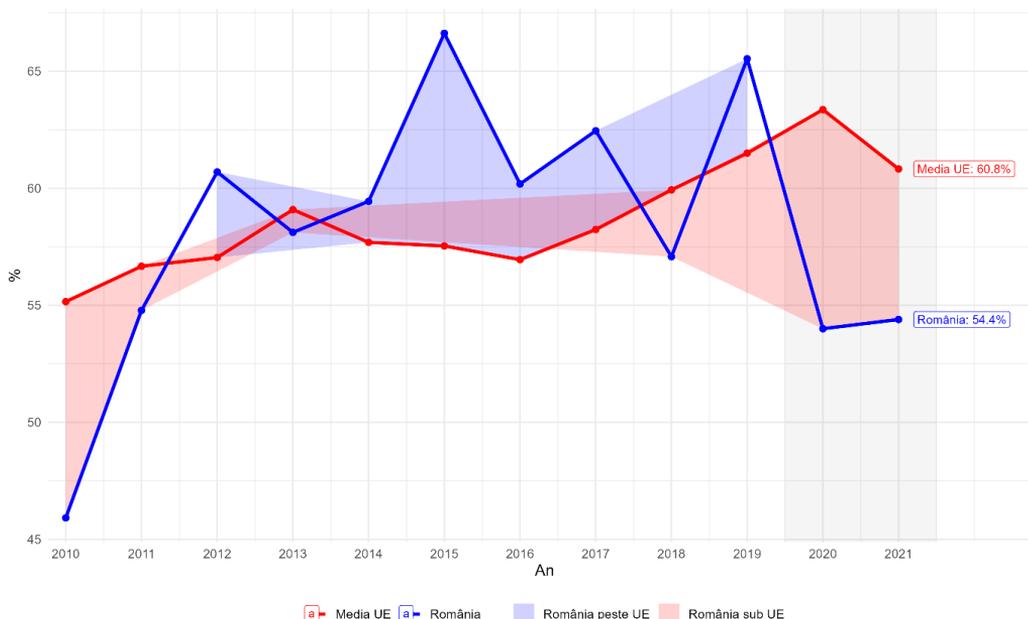


Figure 2. Evolution of the bank cost-to-income ratio (%) in Romania compared to the European Union average (2010–2021)

Source: own processing

In 2010, Romania recorded a level of approximately 46%, below the European average, which seemed to indicate an efficiency advantage. However, this result was circumstantial, resulting from rapid adjustments after the global financial crisis and not from structural consolidation.

Between 2011 and 2015, the cost-to-income ratio rose steadily, exceeding the 66% threshold in 2015, while the European average remained almost unchanged. The sharp increase in the index reflects the burden of non-performing loans and the rigidity of the cost structure, which led to a marked deterioration in efficiency and a widening gap with European standards.

After this peak, between 2016 and 2019, the indicator partially declined and fluctuated between 57% and 65%. However, it remained generally above the EU average, showing that restructuring, optimization, and digitization measures were underway but insufficient to achieve real convergence. During the same period, European banks maintained a more stable level, confirming the difference in institutional and operational maturity.

The significant transformation came in 2020 and 2021, when Romania's cost-to-income ratio fell to 54%, falling below the European average for the first time in many years. This progress was driven by the acceleration of the digitization process and the impact of the COVID-19 pandemic, which forced the optimization of networks and the reduction of operating expenses. Romania thus managed to reverse the gap and achieve a level of efficiency comparable to or even higher than that of the European Union.

The evolution shows that Romania entered the analyzed period with a cyclical advantage, but quickly lost it under the pressure of structural problems and poor asset quality. However, the experience of recent years shows that the Romanian banking sector has the capacity to catch up and converge towards European standards. Maintaining this progress will depend on continued investment in technology and discipline in cost control, in order to avoid a return to high levels in times of economic stress.

3.3. Return on assets (ROA)

Between 2010 and 2014, return on assets (ROA) in Romania recorded negative or very low values, ranging between -0.16% and -0.64% , indicating losses in the banking sector.

The situation worsened in 2014, when the level fell to -1.32% , the worst result of the period, explained by the increase in non-performing loans and the need for additional provisions. In contrast, the European average remained relatively stable, at around $0-0.5\%$, which accentuated the difference between Romania and the rest of the European Union.

After 2015, things changed. The indicator entered a positive trajectory, reaching 1.24% and subsequently stabilizing between 1% and 1.5% . The recovery was possible thanks to the process of cleaning up balance sheets, selling non-performing loan portfolios, and the economic recovery, which supported lending growth and reduced operating costs. However, the gap with the European average remained, as EU banks recorded returns of over 2% after 2015 and continued to advance, exceeding the 4% threshold in 2022.

In Romania, the best point was reached in 2018, with a return of 1.55% , but this development was not sustainable. In 2019, the indicator fell to 1.34% , and in 2020 it fell even further, to 0.95% , amid the effects of the COVID-19 pandemic. Deferrals of payments, additional provisions, and the slowdown in lending reduced profitability, even though it remained positive.

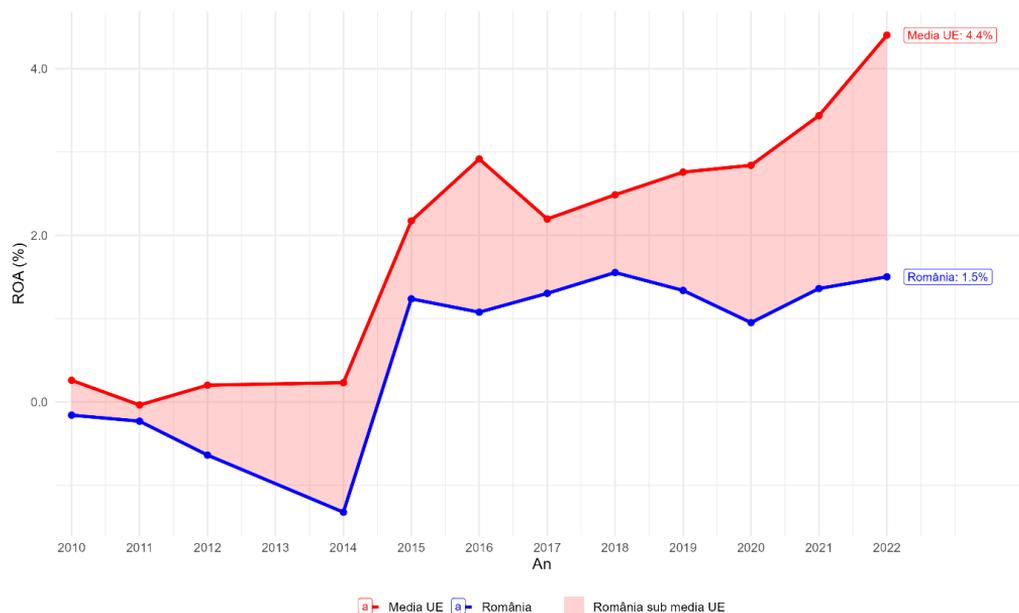


Figure 3. Evolution of return on assets (ROA) in Romania compared to the European Union average (2010–2022)

Source: own processing

After 2020, the return on assets began to recover again, rising to 1.36% in 2021 and 1.50% in 2022. However, the gap with the European Union remained considerable, as the European average accelerated much faster, reaching 4.4% in the same year.

Overall, the evolution of return on assets in Romania shows a transition from post-crisis losses to stable but modest profitability. While European banks have managed to capitalize more effectively on economic growth and innovation, Romanian banks have remained at a lower level, highlighting untapped potential for increased efficiency and profitability in the coming years.

3.4. Return on equity (ROE)

The evolution of return on equity (ROE) in Romania clearly reflects the transformations that the banking sector has undergone over the last decade. Between 2010 and 2014, the indicator was extremely volatile, fluctuating between low positive values and dramatic declines. After a relatively modest start in 2010, at 2.6%, the return approached zero in 2011 and fell to -7.1% in 2012, indicating a severe deterioration in profitability. The situation worsened further in 2014, when the indicator reached -15.2% , marking the lowest point of the period, amid losses generated by the high volume of non-performing loans and the pressure of provisions on capital. During the same period, the European average remained positive, albeit modest, highlighting the structural gap between Romania and the rest of the European Union.

After 2015, the picture changed radically. The banking sector entered a phase of sustained recovery, with balance sheet clean-ups, the resumption of lending, and economic growth. Return on equity suddenly returned to positive territory, reaching 11.3% in 2015, and between 2016 and 2019 it remained between 10% and 13%. This jump confirms that the restructuring and consolidation process has been successful, with Romania gradually approaching the European average and even exceeding it at times.

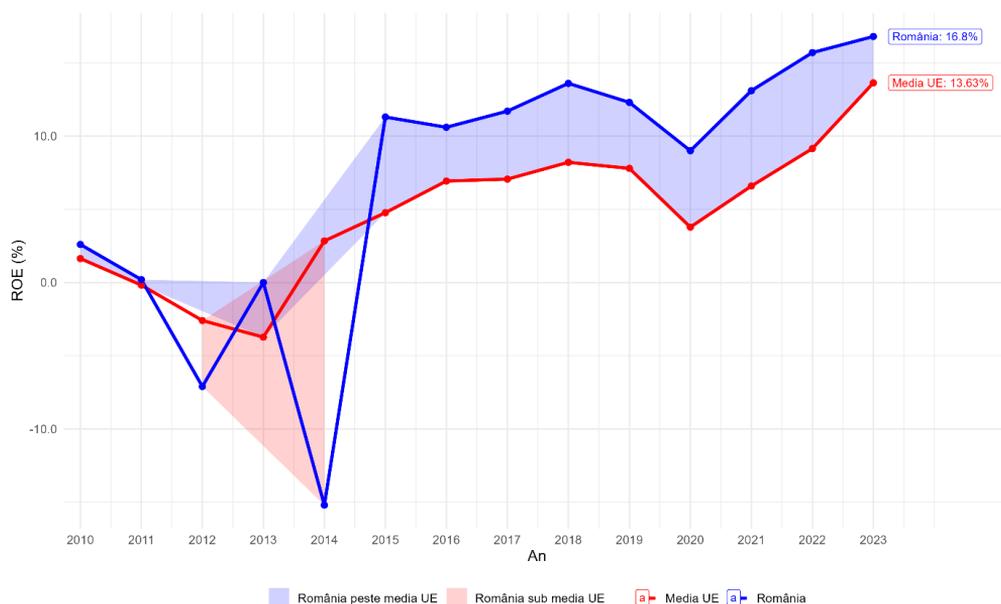


Figure 4. Evolution of return on equity (ROE) in Romania compared to the European Union average (2010–2023)

Source: own processing

The years 2020–2021 brought another adjustment, influenced by the COVID-19 pandemic. The return fell to 9% in 2020, reflecting the pressure of provisions and economic uncertainty, but quickly rebounded in 2021 to over 13%, a sign that the banking system has managed to weather the shock and adapt.

In 2022–2023, the trend was one of the best in the entire series. The return rose to 15.7% in 2022 and 16.8% in 2023, significantly exceeding the European Union average, which stood at around 13.6%. These figures show the high capacity of Romanian banks to generate profits for shareholders, despite an economic context marked by high inflation and geopolitical uncertainty.

The evolution of return on equity in Romania outlines three distinct stages: a critical phase of losses and instability between 2010 and 2014, a rapid recovery and consolidation between 2015 and 2019, and finally, a period of maturation after 2020, in which the indicator not only stabilized, but also consistently exceeded the European average. This progress demonstrates not only the effect of restructuring and digitization, but also the banking sector's ability to capitalize on economic opportunities and strengthen its long-term profitability.

3.5. Non-performing loans

The evolution of non-performing loans (NPLs) in Romania between 2010 and 2020 outlines a complex cycle with three distinct stages: risk accumulation, drastic correction, and stabilization. This indicator is important for understanding the efficiency of the banking sector, as high NPL levels limit institutions' ability to generate profits, tie up capital in provisions, and amplify systemic instability risks.

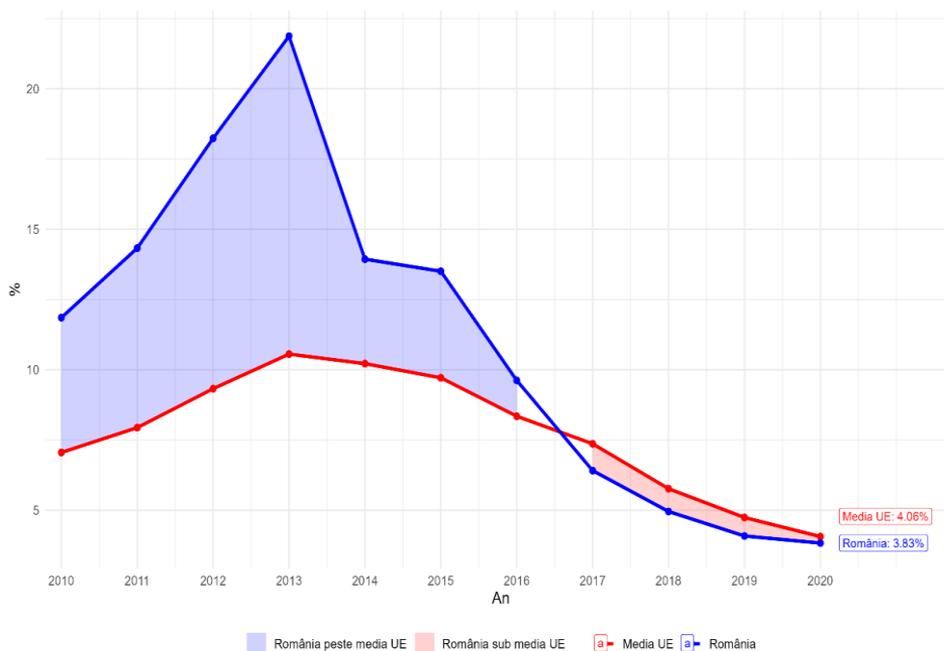


Figure 5. Evolution of non-performing loans as a percentage of total gross loans (%) in Romania compared to the European Union average (2010–2020)

Source: own processing

Between 2010 and 2013, Romania experienced a process of accelerated deterioration in the quality of its loan portfolios. The NPL level rose from almost 12% to over 21%, more than twice the European average, which remained around 10%. This dynamic reflected the cumulative effects of the credit expansion in 2006–2008, when relaxed standards fueled a credit boom, and the subsequent recession, which reduced borrowers' ability to repay their loans. Unlike Western European economies, where the crisis was mitigated by rapid government intervention and early bank restructuring, Romania faced a delayed and more abrupt correction, which exposed structural weaknesses in risk management.

Between 2014 and 2016, the structure of Romania's banking sector changed significantly. Under pressure from regulators, particularly the National Bank of Romania, banks began selling off large portfolios of non-performing loans to investors specializing in the management and recovery of such assets. Among the most active were APS Holding in the Czech Republic, the Polish company Kruk, the German group EOS, and the Swedish firm Intrum Justitia. The intervention of these entities facilitated an extensive process of balance sheet cleaning, which led to a rapid reduction in the NPL ratio and strengthened the stability of the banking system. Banks accelerated the sale of non-performing loans, strengthened provisions, and revised lending criteria, which led to a significant reduction in NPLs—from over 21% in 2013 to below 10% in 2016. In comparative terms, this adjustment was one of the fastest in the Central and Eastern European region.

After 2017, Romania entered a phase of stabilization and convergence. The NPL level fell steadily to 3.8% in 2020, falling below the European Union average (4%) for the first time. This performance is remarkable, considering that in just seven years Romania has gone from being one of the most exposed economies in Europe to the risk of non-performance to a relatively favorable position, comparable or even superior

to the European average. The result reflects not only restructuring efforts, but also the maturing of lending processes, the diversification of bank income sources, and the implementation of stricter risk assessment standards.

The impact of the reduction in non-performing loans has been manifold. First, it freed up capital previously tied up in provisions, allowing banks to resume lending and improve their solvency ratios. Second, it supported the recovery of profitability, as reflected in the evolution of return on equity (ROE) and return on assets (ROA), which entered a positive trajectory after 2015. Third, it strengthened investor confidence and contributed to the stability of the financial system by reducing vulnerabilities that could have amplified external shocks, such as those associated with the COVID-19 pandemic.

4. Conclusions

A comparative analysis of key financial and operational performance indicators shows that the Romanian banking system underwent a complex process of structural adjustment between 2010 and 2023, characterized by three distinct phases: post-crisis, consolidation, and accelerated convergence. General expenses relative to assets confirm the existence of a persistent gap compared to the European average, but its reduction in 2020–2021 highlights the cumulative effects of digitization, restructuring of territorial networks, and optimization of operational processes. The evolution of the cost-to-income ratio initially highlights the structural rigidity of the Romanian banking sector, affected by high levels of non-performing loans and cost inertia. However, the reversal of the trend after 2020 shows that technology integration, process automation, and adaptation to new market conditions can generate significant and sustainable efficiency gains.

Profitability indicators, ROA and ROE, confirm the transition from a period of financial vulnerability to a cycle of robust profitability. The accelerated recovery after 2015 and the exceeding of the EU average in terms of ROE in recent years highlight the maturing of the financial intermediation process, the improvement in asset quality, and a superior capacity to monetize banking activities. However, the persistence of a gap in ROA indicates the existence of structural constraints, such as still high infrastructure costs and constraints generated by a moderate level of financial intermediation.

The evolution of non-performing loans is one of the most telling signs of the transformation of the Romanian banking system. The reduction of NPLs from over 21% to values comparable to or below the European average demonstrates the effectiveness of balance sheet clean-up measures, the effectiveness of regulatory interventions, and the consolidation of prudent lending practices. This adjustment has allowed banks to free up capital, reduce pressure on provisions, and redirect resources to productive activities, directly contributing to increased efficiency and profitability.

Overall, the results indicate a clear process of convergence with European standards, accelerated by the adoption of new technologies, the modernization of digital infrastructure, and the restructuring of traditional operating models. Romania has evolved from a banking system marked by systemic vulnerabilities to one characterized by high profitability, stability, and an increasingly advanced degree of efficiency. However, the sustainability of progress depends on maintaining the pace of investment in digitization, diversifying the business model, rigorously controlling costs, and strengthening the quality of loan portfolios. In a volatile economic environment marked by geopolitical tensions, the banking system's ability to integrate technology, manage emerging risks, and optimize operational performance will determine its future level of competitiveness and resilience vis-à-vis the European Union.

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