A Multi-Year Financial Performance Comparison of Banks: Neutrosophic Approach

Samandarboy Sulaymanov [1,*]

[1]Tashkent State University of Economics, Uzbekistan

Email: s.sulaymanov@tsue.uz

Abstract

In this work, a comparison plan of Agrobank and NBU for the financial years 2021, 2022, 2023, and 2024 is provided via neutrosophic approach in terms of indicators of profitability, liquidity, and solvency. The profits of the banks are analyzed through the application of net profit margin, profitability coefficient, absolute liquidity ratio, and solvency ratios. The economic ratios on profitability and liquidity point out that the NBU bank is performing better than the Agrobank but solvency ratios depict that Agrobank is more stabilized than NBU. This framework will avail a relative comparison of the two banks in terms of the opportunities, threats, strengths and weaknesses of each. In this way, findings can improve the understanding of banking industry's performance in Uzbekistan and provide useful information to policuemakers and researchers. Continuation of the study could include the consideration of factors outside the firm to determine how they affect financial performance.

Keywords: Financial Performance; Profitability; Liquidity; Solvency; Comparative Analysis; Neutrosophic Analysis

1 Introduction

The analysis of the financial performance of the banks is one of the most important issues in examining the social effectiveness since financial institutions and their stability are prevailing determinants that reigning in the level and nature of economic growth and financial stability. Banks act as a very important part of the financial system since they help in mobilizing and channeling funds, offer credit facilities and ensure the payment system. Strategizing, therefore, for their growth calls for the evaluation of their financial performance to check on the health of the banking sector.

The three key factors which are commonly used in evaluating the performance of any bank include profitability, liquidity and solvency. The use of profitability in determining how much revenue a bank earns against its cost line is suiting for the purposes of assessing the entity's sustainability. Liquidity shows how capable the bank is to meet it settles its short-term financial obligations, which is determinant in the running of the operations. Solvency on the other hand checks the ability of a bank to meet its liability commitment with its assets so as to be financially sound in the long run.[18]

In the past few years, there have been some major changes taking place in the banking sector of Uzbekistan, particularly the major players including Agrobank and the National Bank of Uzbekistan (NBU). As a result of the changes that have taken place within the financial industry, assessment of financial viability of these banks is relevant for stakeholders, investors and policy makers.

Agrobank and NBU are two representative banks in Uzbekistan which has differences in organizational structure and financial plan. As mentioned earlier, Agrobank mainly operates in one niche market, namely, the agricultural department, while the NBU operates in a variety of sectors interested in industrial, trade, and retail banking. A comparative analysis of the financial data of both corporations for several years highlights their advantages and disadvantages more effectively.

Related Work in section 2 confirms that much study has been conducted on evaluation of the financial performance with the help of several measures and different analysis methodologies. However, rather few studies available in the literature compare the performance of Agrobank and NBU with respect to profitability, liquidity, and solvency in another period of time. That is why this research seeks to conduct an analysis and comparative assessment of the two banks from the year 2021 to 2024.[20]

Generally this paper seeks to analyze the performance of Agrobank and NBU and its findings shall be based on the analysis of ratios of the two firms. The measure of profitability is made up of net profit margin and profitability coefficient; liquidity by an absolute measure and solvency by ratio of own funds to borrowed funds. Hence, the comparative approach assists in pinpointing the trends and highlighting the strengths as well as the weaknesses over the time. In this regard, neutrosophic theory is quite a powerful tool. It was applied in analysing sustainable health development,[26] Predicting customer attrition in financial sectors, and international market selection.[4]

The research uses the financial statements documents that has been collected from the two banks for the given period. In view of the above objectives the result is analyzed through ratio analysis and trend analysis to learning the financial health position of Agrobank and NBU. The conclusion of this research will be useful towards enhancing the financial performance of these banks and helpful to the decision makers.[6]

It should be noted that the comparison made in this paper is useful not only for theoretical research but also for decision-making. Hence, this research was able to provide a better understanding of profitability, liquidity, and solvency so as to facilitate the formulation of better policies in relation to the efficacy of chances for better prospects in the management of banks.

In addition, it also reveals those aspects in which each of the analysed banks performs best and notes potential fields for development. Knowledge of these aspects will be useful in planning to boost financial stability as well as profitability of the banking sector in Uzbekistan.

The paper's structure consists of the following parts: related work section and the methodology, which contains information on data sources and analysis methods, used in the present study. This is followed by the section that presents the results and discussion of the findings, whereby the study compares the selected financial performance indicators. The last one gives conclusions and suggests further research findings for the use in studies.

2 Related Work

The studies on the evaluation of the financial performance in the banking sector have been done for many studies. These factors that the scholars have deemed as influential include; profitability, liquidity and solvency. Ratio analysis has been applied often in performances of the commercial banks especially in the emerging economical situations that existed most times at the financial conditions of different countries of the world.

The analysis of performance on financial profitability based mainly depends on the net profit margin, return on assets, and return on equity. These ratios are crucial in ascertaining the extent to which the banking sector manages its resources with a view of turning in lucrative profits. This shows that when one compares multiple banks, one may find out that there is need to explain why certain banks have different profitability from others, despite being in the same industry, having similar products, and services, operational in similar markets.[3,9,19]

Liquidity analysis has also not been left behind in the list that has attracted more concern. A number of proforma measures, including the absolute liquidity ratio and the quick ratio are also used extensively to determine

the ability of a bank to meet it short-term obligations. Companies with higher liquidity are in a stronger form to counter any financial risks and risks that may hinder operation.

The two key solvency ratios are the capital adequacy ratios, which is used to determine the extent of assets that must be sold to meet current obligations and the leverage ratios that is used to determine the number of times current assets is funded by shareholders' equity.[15] These indicators reveal the success of a bank to meet its obligations with other assets more so in the short-term basis. For example, it has also been demonstrated that the more solvent a bank is the more it is likely to be resilient to shocks in its operating environment.[25]

Comparing the structurally similar entities regarding their financial performances over the years as the present banks is a suitable approach in the academic literature. Such studies can show dissimilarities in profitability, liquidity and solvency of the commercial banks and investment banks as well as the rural commercial banks with different operating capacity and scope.[1,23]

This is because of the interest in understanding the effects of economic changes on the financial performance. Several authors have looked into the impacts that outside forces, including inflation, interest rates, and the government policies, have on the banks' profits and solvency. Research has shown that, policies and market factors significantly influence the performance of the firms' finances.[8]

There are many researches dedicated to the banking sector of developing countries in which are less stable financial systems. In such cases, analysing liquidity and solvency of the company is vital to predictive purposes, stability and avoiding consequence systemic risks.[10]

Some recent studies also include relatively more complex techniques like machine learning or econometric modeling. These have given better understanding of the factors that influence financial performance and forecasting of the same has been enhanced. Furthermore, nowadays applying the neutrosophic theory became widespread in analysing the banking performance, fraud detection in bank systems, cyber security on the banking and financial sectors, and blockchain-based smart contracts. In particular, findings of the research conducted by Mohamed Bechir and Nadia Mansour applying neutrosophic techniques showed a positive and significant relationship between gender diversity and performance, with the return on equity variable being used to test performance. They also discovered that independence of directors has a positive influence on performance.[11]

While there are many researches on the financial performance of single or some selected banks or a group of them, relatively limited studies can be found where the researchers compared the performance of the banks based on its operating scope. Besides, there is a scarcity of the studies that would provide an overall assessment of the financial performance of the Agrobank and the NBU for several years.

Hence, this study intends to serve as a solution by comparing for several years Agrobank and NBU on profitability,liquidity and solvency. The results will help show that bank's strong and weak points and would be beneficial to know in which area the bank needs improvement.

3 Methodology

The approach used in this study is going to provide the research with a clear roadmap that will involve comparing Agrobank and NBU's financial performance for a period lasting for four years (2021-2024). The first one of them is the analysis of the financial viability of the two banks through financial profitability and liquidity and solvency ratios/metrics. Under this section, the process of data collection and selection of measures is discussed in addition to the used financial ratios and analytical methods, as shown in Figure 1. This method stipulates a good approach for assessing the relative performance of Agrobank and NBU in terms of their financial performance. Profitability, liquidity and solvency ratios used to analyse the validity of assessments of the banks' financial condition and effectiveness of their work. Therefore, apart from making a comparison between the two banks in terms of their financial performance, the study also examines ratio and trends for the given period. The chosen approach in this case is aimed at deepening the knowledge of financial stability of the banking system of Uzbekistan.

Table 1: Comparison of Existing Studies and Research Gap

Aspect	Existing Studies	Research Gap
Profitability Analysis	Focused on profitability metrics like ROA, ROE, Net Profit Margin	Limited multi-year comparison between Agrobank and NBU
Liquidity Analysis	Application of liquidity ratios like Absolute Liquidity Ratio	Lack of comparative analysis of Agrobank and NBU's liquidity performance
Solvency Analysis	Solvency ratios used for financial stability assessment	Inadequate assessment of Agrobank and NBU's solvency over multiple years
Comparative Studies	Comparisons of commercial banks and investment banks	Limited studies comparing Agrobank and NBU specifically
Multi-Year Analysis	Time-series analysis in general contexts	Insufficient examination of Agrobank and NBU from 2021 to 2024

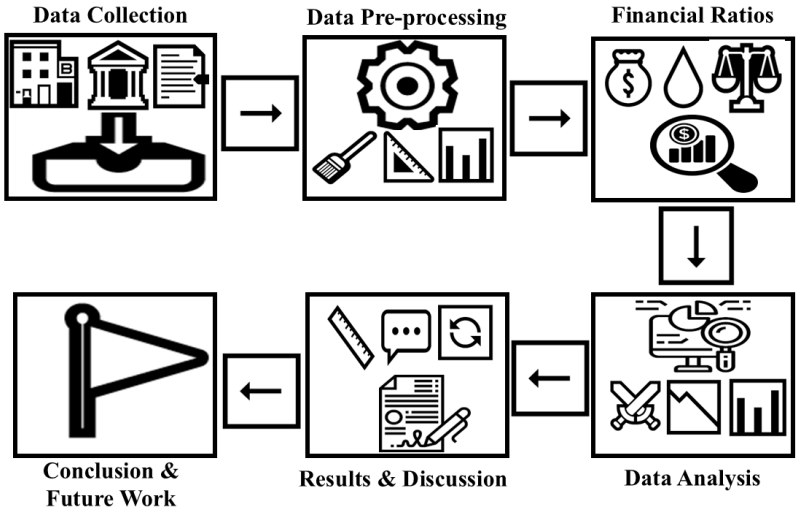

Figure 1: Proposed Methodology Framework for Comparative Financial Analysis of Agrobank and NBU.

3.1 Data Collection

Agrobank and NBU remained the main sources of the data needed for this study; therefore, annual financial statements from 2021 to 2024 were considered. They consist of such accounting values of balance sheet like assets, liabilities, total equity, interest income, interest expense, non interest income, non-interest expenses, operating costs, net profit and other necessary values. These data are significant in computation of financial ratios that indicate on the Banks profitability, liquidity and solvency. The sources of data used in this note reduces the possibility of using inaccurate information as they are audited financial statements.

3.2 Financial Ratios and Metrics

Thus, in order to measure and compare the performance of the two banks on the basis of their financial structure, the following ratios have been chosen for the study:

Profitability Ratios: Profitability ratios and with regard to income explain the ability of the bank to realize income in relation to expenditure and the assets put into operation. Based on the above discussion, the following are the primary profitability ratios that were adopted in this study:

- **Net Profit Margin:** Measures the percentage of revenue that remains as profit after all expenses are deducted.

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Total Revenue}} \times 100 \tag{1}$$

- **Return on Assets (ROA):** Evaluates the efficiency of asset utilization to generate profits.

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}} \times 100 \tag{2}$$

- **Profitability Coefficient of Authorized Capital:** Indicates the profitability concerning the bank's authorized capital.

$$\text{Profitability Coefficient} = \frac{\text{Net Profit}}{\text{Authorized Capital}} \times 100 \tag{3}$$

Liquidity Ratios: Liquidity ratios present the ability of the bank to meet nearness claims in the course of the foreseeable occurrence. Such key liquidity ratios that have been discussed in this study are as follows:

- **Absolute Liquidity Ratio:** Measures the most liquid assets against current liabilities.

$$\text{Absolute Liquidity Ratio} = \frac{\text{Cash and Cash Equivalents}}{\text{Current Liabilities}} \times 100 \tag{4}$$

- **General Solvency Coverage Ratio:** Indicates the coverage of liabilities by total assets.

$$\text{Solvency Coverage Ratio} = \frac{\text{Total Assets}}{\text{Total Liabilities}} \times 100 \tag{5}$$

Solvency Ratios: Solvency ratios assess the long-term financial stability of a bank. Important solvency ratios considered are:

- **Own Funds to Attracted Funds Ratio:** Evaluates the proportion of a bank's own funds relative to the borrowed funds.

$$\text{Own to Attracted Funds Ratio} = \frac{\text{Own Funds}}{\text{Attracted Funds}} \times 100 \tag{6}$$

- **Issuer's Own Funds to Borrowed Funds Ratio:** Reflects the ratio of a bank's own funds compared to its borrowings.

$$\text{Issuer's Funds to Borrowed Funds Ratio} = \frac{\text{Issuer's Own Funds}}{\text{Borrowed Funds}} \times 100 \tag{7}$$

3.3 Neutrosophic theory and the prospects of its implementation into bank performance analysis

The following financial ratios were computed in the analysis, and it has been assumed that the percentage enhancement will occur linearly from year 2021 to 2024. An evaluation on the performances of the two entities is done by comparing Agrobank with NBU. In addition to that, the trend analysis is used to review information over time as specified in the study period while the ratio analysis is used to evaluate the financial health of the business in question that is each bank. line graphs and bar charts are applied in presenting the financial trends in a simplified manner.[7]

To manage uncertainties and imprecisions in 1965,[24] introduced the Fuzzy Set (FS). A generalization of Fundamental Sets (FS) and Intuitionistic Fundamental Sets (IFS) is provided by the Neutrosophic Sets (NSs) of Smarandache. while the FS gives the degree of Truth Membership (TM) of a component in a set, the IFS provides a degree of TM and also a degree of False Membership (FM), and the NS provides a degree of TM, a degree of Indeterminacy Membership (IM), and a level of FM. whereas the NS provides the degree of Truth Membership (TM), a degree of False Membership (FM), and a degree of Indeterminancy Membership (IM)[16]

with IFS, the FM function does not depend on the TM function; but it is not the case with FS, since the FM function is dependent on the TM function. The TM function, IM function, and FM function are each different and independent in NS. Smarandache introduced the distinction between NSs and the different extensions of FSs that exist. One example of NS that can be traced to the work of Smarandache is named Single-Valued NS (SVNS). The SVNS was introduced by the first author, Haibin Wang, in the international symposium that took place in Salt Lake City, Utah, United States. In order to get much attention from the researchers, NSs and SVNSs have been introduced in a variety of seminars and published in a variety of conferences and journals.

In Neutrosophy, one can relate a notion to both its opposite and its neutral in order to get their common elements, as shown by the formula $A >$ non-$A >$ = nonempty set.[22] It is the most common part of the rare things. It is a contradiction, but it is true.[5] Neutrosophic logic, neutrosophic sets, neutrosophic probabilities, neutrosophic data, neutrosophic policies, neutrosophic physics, and neutrosophic algebraic structures are all progeny of neutrosophy.[13]

It holds good but in a limited context, i.e. Hegelian dialectics only handles the dynamics of opposites ('A' and 'anti-A'), but in our everyday life, not only the opposites interact, but the neutrals 'neut-A' among them too.[2] This is because in Hegelian dialectics, only the dynamics of the opposites ('A' and 'anti-A') are considered.[17] For instance, if you are fighting a man (i.e. the two of you are polar opposites of each other), but those who are not on either side of the conflict, including the police, get involved and attempt to bring the two of you together again. Neutrosophy is the study of the connections between opposite forces and their neutral states.[21]

Compared to other types of logic, NL contains a larger percentage of "indeterminacy" from unforeseen factors hidden in some statements. It also makes each component t, i, and f "boil over" 100 or "freeze below" 0 respectively. For instance, the value t in some tautologies is over 100, a quality referred to as "overtrue." Neutrosophic Set is a powerful tool that might be employed so as to describe information that is uncertain, imprecise, incomplete, and irregular.[14]

The basics of neutrosophic sets are as follows:

Definition 1 The neutrosophic sets S can be defined in the space x as:

$$S = \langle x, T_S(x), I_S(x), F_S(x), x \in X \rangle \tag{8}$$

Where $T_S(x)$ is the truth membership function, $I_S(x)$ is an indeterminacy membership function, and $F_S(x)$ is a falsity membership function. The sum of the three previous parameters is:

$$0 \leq T_S(x) + I_S(x) + F_S(x) \leq 3 \tag{9}$$

Definition 2 The single-valued neutrosophic set (SVNS) is a significant generalization of the intuitionistic fuzzy set, single-valued fuzzy set, and classical fuzzy set. To bypass the challenges of applying nonstandard subsets to real-world problems, Wang et al. put forward single-valued neutrosophic numbers (SVNNs), which present a more practical alternative. The complexity of nonstandard subsets makes them inappropriate for real-world problems, which further justifies the use of SVNNs. Moreover, all set-theoretic operators established in the context of SVNS possess fundamental and consistent properties.

Definition 3 In most decision-making issues, decision-makers play different levels of importance based on their position and field of expertise. Therefore, it is necessary to study the impact of the contribution of each decision-maker. If decision-maker evaluation is done using single-valued neutrosophic numbers (SVNNs), the corresponding weights can be determined as below:

$$E_S = \frac{1 - \sqrt{\frac{(1-T_S)^2+(I_S)^2+(F_S)^2}{3}}}{a_S^{p=1}\left(1 - \sqrt{\frac{(1-T_S)^2+(I_S)^2+(F_S)^2}{3}}\right)} \tag{10}$$

Definition 4 In an MCDM setting, decision makers may draw different conclusions regarding the variables, which may be called criteria or measures based on the extent of analysis. However, for the purposes of consistency and accuracy in the decision-making process, it is necessary to consolidate these individual judgments at each stage. The combination of multiple decision makers may be determined as follows:

$$G = (g_{ij})_{n\times n} = \langle g_{ij}^1, g_{ij}^2, g_{ij}^3, \ldots, g_{ij}^p \rangle = \langle e_1 g_{ij}^1 \oplus e_2 g_{ij}^2 \oplus e_3 g_{ij}^3 \oplus \cdots \oplus e_p g_{ij}^p \rangle \tag{11}$$

$$= \frac{1 - \prod_{s=1}^{p} (1 - T_{ij}^s)^{e_s}}{\left\langle \prod_{s=1}^{p} (I_{ij}^s)^{e_s}, \prod_{s=1}^{p} (I_{ij}^s)^{e_s} \right\rangle} \tag{12}$$

Definition 5 The score function to compute the crisp value is given as:

$$F_S = 1 - \sqrt{\frac{(1 - T_S(x))^2 + (I_S(x))^2 + (F_S(x))^2}{3}} \tag{13}$$

Extending the foundation of complex neutrosophic sets (CNSs), Nasir et al.[12] introduced an extension of this framework known as complex neutrosophic relations (CNRs) and their types. These concepts are substantiated with real-world examples related to their applications. When we are measuring the quality of a relation in a CNR, three fundamental components are considered: the membership degree, the abstention degree, and the nonmembership degree. These components are all described in terms of complex numbers originating from the unit circle in the complex plane.

4 Results and Discussion

Here, the following comparison between the two companies is presented: Agrobank and NBU. The results provided are linked by the perspectives of profitability, liquidity, and solvency for the years 2021-2024.The shifts and variation in the financial performance of both the banks are compared on the basis of analytical results of the study.

4.1 Financial Summary

The detailed comparison of both the banks is provided in the form of financial summary in the table below in Table 2 The table below displays the balance sheet of the Agrobank and NBU in regard to the assets, liabilities, and equity in the given period. The table below demonstrates that the overall value of the assets of Agrobank increased and so did its liabilities in the years that passed as well as its equity that reached 2024. In the balance, assets and liabilities, compared with the level of the previous year, NBU demonstrated significantly higher growth rate than Agrobank, which indicates the more active expansion of its activities.

The increase of assets of both the banks reflect that their financial activities have been on the rise. Still, it is worth to recognize that NBU has effectively formed its assets at a higher rate than its counterparts, implying either a more active investment approach or a simply larger number of customers. In addition, the higher the liabilities imply that NBU may be using borrowed fund or deposits to finance operations more than what Agrobank is doing, as shown in Figure 2.

Table 2: Financial Summary of Agrobank and NBU (2021–2024)

Year	Bank	Assets	Liabilities	Equity
2021	Agrobank	31211.06	25839.85	5371.21
2022	Agrobank	39971.15	30625.02	9346.14
2023	Agrobank	53068.19	43562.92	9505.27
2024	Agrobank	66699.71	54402.79	12296.91
2021	NBU	79861.14	65988.04	13873.10
2022	NBU	89919.41	75150.70	14768.71
2023	NBU	119918.14	103540.55	16377.59
2024	NBU	127502.89	109654.21	17848.68

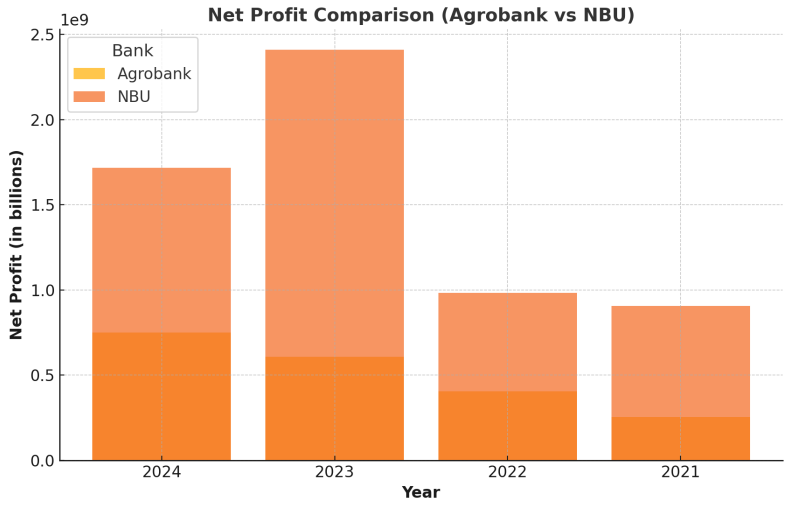

Figure 2: Net Profit Comparison of Agrobank and NBU (2021–2024)

4.2 Profitability Analysis

Gross profit is another measure of financial success since it reveals how a particular bank can generate revenues in relations to its costs and other expenses. There are other measures based on the profitability aspects as table 3 presents.

Despite the fact that both of them have been growing over the past four years, NBU maintain more attractive net profit margines and ROA in the majority of the years. This indicates that it has a higher possibility of making an efficient utilization of its available resources to produce an income. The improvement in the net profit margin of NBU could be due to the better managerial performance, better sales of interest and non-interest income, or better efficiency in controlling the operating expenses.

The trend of ROA also shows that NBU has better utilization of assets than Agrobank in the following manner. Nevertheless, profitability of Agrobank increased over these years, and this is an improving factor that is however lower than the recognized NBU. As shown in Figure 4:

4.3 Liquidity and Solvency Analysis

In the following table, both banks' liquidity and solvency ratios have provided in the Table 4. This layout of ratios shows that while the Agrobank has maintained a better extent of stability with the liquidity ratios of dear, those of NBU vary significantly in different years.

Moreso, while the numbers show that Agrobank made comparatively less profits in some years, it depicted better relative liquidity stability. But solvency turned out to be higher in NBU, and this equation depicts a

Table 3: Profitability Metrics (2021–2024)

Year	Bank	Net Profit	Net Profit Margin (%)	ROA (%)
2021	Agrobank	254.88	11.91	1.13
2022	Agrobank	404.12	10.98	1.09
2023	Agrobank	609.23	8.55	1.35
2024	Agrobank	750.89	7.62	1.27
2021	NBU	905.42	11.91	1.13
2022	NBU	983.33	10.98	1.09
2023	NBU	2409.59	15.33	2.01
2024	NBU	1716.55	8.55	1.35

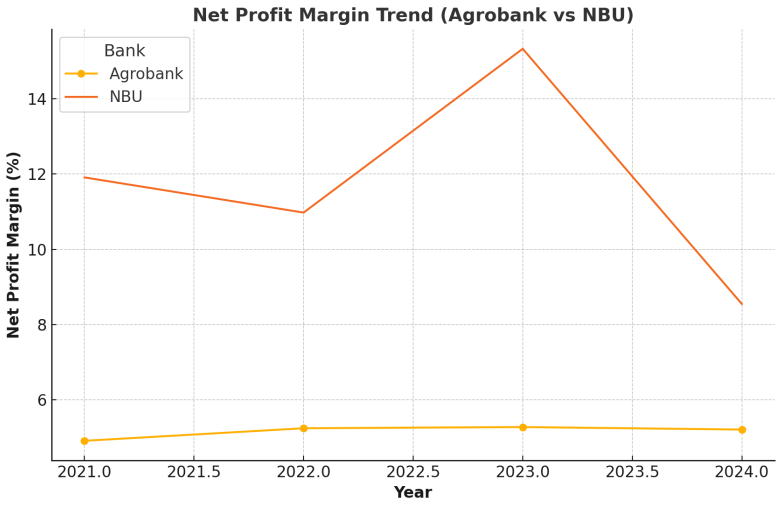

Figure 3: Net Profit Margin Trend (2021–2024)

better capacity to meet the amount owed over assets. From this difference, we can deduce that, although, NBU yields more profits than Agrobank, the latter is less vulnerable in the provision of liquidity.As shown in Figure 5:

5 Conclusion

The comparative analysis of the two financial ratios of profitability, liquidity and solvency of Agrobank and NBU by the years 2021 to 2024 has been prepared in this paper. It is evident from the results presented here that the two banks have different operating models and financial reporting systems.

In the analysis of financial profitability, it was apparent that NBU was financially more rewarding than Agrobank in terms of both net profit margin and return on assets (ROA). This a clear indication that NBU has a higher ability to generate income from the assets than the other banks due to better interest income and other earning, coupled with effective cost control.

In this far as liquidity is concerned, trends established for Agrobank showed better stability than that observed for NBU which has fluctuated over the years. This implies that compared to other banks, for instance, Standard Chartered Bank, Agrobank has been relatively conservative in managing its liquidity perhaps to emphasize on an easily manageable short term liquidity risk rather than growth as is the case with most well-developed economies.

From the solvency ratios calculated above, it was noticed that NBU had a slightly better solvency capacity to offset their liabilities with their assets than Agrobank. This could be explained by the fact that NBU company has a greater asset base and it reported higher profitability thus making it financially stronger.

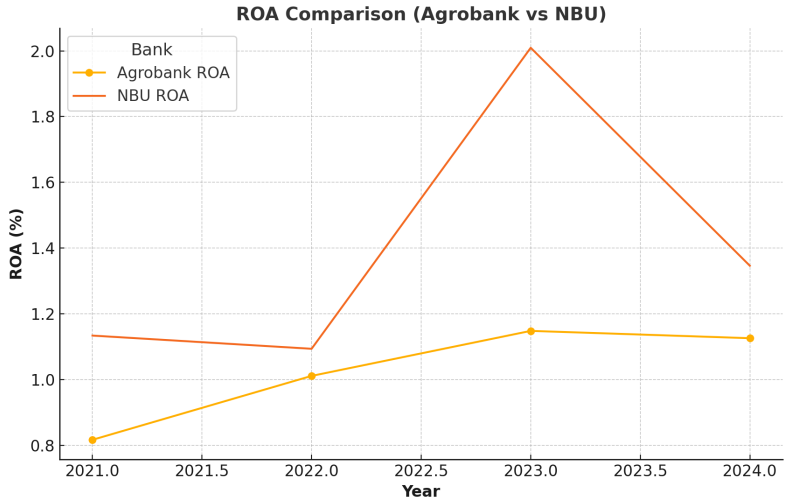

Figure 4: Return on Assets (ROA) Comparison (2021–2024)

Table 4: Liquidity and Solvency Ratios of Agrobank and NBU (2021–2024)

Year	Bank	Liquidity Ratio (%)	General Solvency Ratio (%)	Own to Borrowed Funds Ratio (%)
2021	Agrobank	100.08	164.0	49.0
2022	Agrobank	115.9	162.8	55.8
2023	Agrobank	110.3	121.7	36.3
2024	Agrobank	104.0	123.2	38.9
2021	NBU	108.0	164.0	49.0
2022	NBU	115.9	162.8	55.8
2023	NBU	110.3	121.7	36.3
2024	NBU	104.0	123.2	38.9

In general, the paper gives a comprehensive understanding of the financial condition of the Agrobank and NBU while pointing out where the banks may need improvement. Future work can further extend this comparison to other banks within the region and it can also measures the variables such as risk management factors, operational effectiveness and other factors that have an impact on the performance of these financial institutions. In addition, the study presents a neutrosophic approach to the more efficient management of uncertainties and imprecisions in financial analysis. Neutrosophic logic is a generalization of classical fuzzy and intuitionistic fuzzy logic in the sense that it considers degrees of truth, indeterminacy, and falsity, and thereby gives a more comprehensive evaluation of financial performance. This method enhances the financial ratio and trend evaluation by including different degrees of uncertainty, which is most useful in predicting financial stability and risk management. Based on neutrosophic sets, this paper gives a broader analytical perspective by considering variability and ambiguity in financial data and making a more flexible and realistic evaluation of the banks' performance.

6 Future Implications

The implications of the comparative analysis of the Agrobank and NBU for the stake holders, the policy makers and researcher are as follows. Since financial performance is a key factor in banking stability and future growth, such differences hold usefulness in the planning arena and policy making.

Firstly, the higher profitability observed in NBU means that the enhancement of efficiency as in the case of NBU is something Agrobank should consider for its own benefit. Realisation of higher revenues both through interest and non interest income enhancement and increase in operational efficiency may also result to improved profitability for Agrobank.

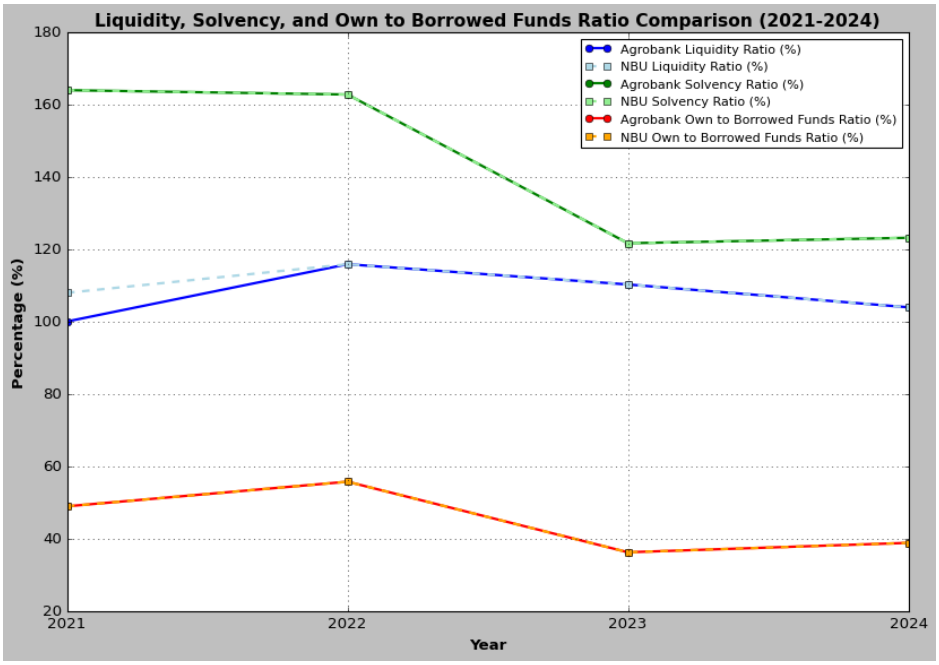

Figure 5: Liquidity and Solvency Ratios Comparison (2021–2024)

Secondly, ranging between 0.8 – 1, the reasonable liquidity ratios of the organization prove relatively sound short-term solveny management of Agrobank. Thus, NBU can improve its liquidity management procedures to reduce fluctuations and stabilize meeting the latter or other short-term obligations. The regulators and policymakers may look for ways of establishing measures by which the liquidity and profitability policies can be well balanced.

Concerning solvency, it is evident that although the two components point to financial solvency, constant analysis of solvency ratios is required. Attention should be paid to the recomposition of capital and ensuring the mostly permanent balance between equity and liabilities on the one hand and the mostly temporary sources of funds on the other hand in order to provide a sound foundation for further growth and prosperity in the years to come.

Therefore, such a study deserves to be carried out on a comparison basis, where the tendency and changes in the financial performance of organizations over several years are analyzed. Further research could be made to involve other banks operating in the area comparing the bank's performance with regards to risk management and operation efficiency as well as the organization's vulnerability to external macroeconomic shocks.

The knowledge derived from this study might be useful for investment decision making for investors, formulation of policies for regulation, and determination of appropriate courses of action in the field of finance. Also the inclusion of some application of Machin learning and econometric modeling could also make the comparison of the financial performance more rigorous.

Also, neutrosophic approaches to financial decision-making can provide a more comprehensive analysis of bank performance. Neutrosophic logic allows flexible manipulation of uncertainty, which is essential in analyzing volatile economic situations and financial risks. Neutrosophic sets and logic can be utilized to assist policymakers and financial analysts in developing better risk assessment models, improving bank strategies, and making more informed decisions considering both certain and indeterminate variables. The novel approach contributes to the validity of financial forecasting and decision-making by incorporating real-world complexities that could be omitted by traditional models.

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