

Suitability of Simple Forecasting Techniques for Predicting the Performance of Banks in the Zambian Financial Industry

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Abstract:

The aim of this article is to examine the suitability of simple forecasting techniques and identify the most effective forecasting technique for predicting the performance of banks in the Zambian financial industry. The study uses various forecasting techniques using Zambian bank financial data from 2010 to 2016 and produces forecasts for the years 2017 to 2021. The accuracy of these forecasts is then compared with the actual performance during the two years and the technique that produces the closest results, is selected based on the actual results is considered the most appropriate forecasting technique. The study found that linear regression not only produces results that are closest to actual values, but is also sufficiently precise for informed decision making.

Keywords: Simple Forecasting Techniques, Performance of Banks, Predicting performance, Zambian Financial Industry

1. Introduction

Predicting bank performance is of paramount importance to the Zambian financial industry, enabling decision makers to make informed strategic decisions, identify potential risks and optimize resource allocation. This article focuses on comparing various forecasting techniques to determine the most accurate method of predicting bank performance in the dynamic Zambian financial landscape. The aim of the forecast is to provide the most objective and substantive conditions possible for making business decisions and analyzing the events that may occur (Kurzak 2012).

2. Literature Review

There are numerous different definitions for the term “forecast” in the literature. One might think that this is a very complex concept. However, a forecast is simply a prediction about the future value of data and most extrapolative model forecasts assume that the past is an indicator of the future (Guerard 2013).

2.1 Forecasting techniques in the financial industry

The financial industry relies heavily on various forecasting techniques to predict crucial indicators that impact decision-making processes. Time series analysis, a common technique, is used to analyze historical data trends and patterns to make future predictions (Seyedan & Mafakheri, 2020). Regression models, on the other hand, establish relationships between variables to predict outcomes based on their historical behavior. Artificial neural networks, inspired by the way the human brain works, are gaining popularity due to their ability to learn complex patterns from historical data and predict future trends. Additionally, machine learning algorithms such as Random Forests and Support Vector Machines have shown promising results in forecasting financial indicators (Teles et al., 2021). These diverse techniques provide financial institutions with a wide range of forecasting tools to optimize strategic planning and risk management.

2.2 The importance of accurate bank performance forecasts

Accurate banking performance forecasting is critical for financial institutions operating in the dynamic Zambian financial landscape. In a highly competitive market, accurate forecasts enable banks to allocate resources effectively and take advantage of emerging opportunities. Additionally, accurate forecasts help identify potential risks and implement proactive measures to mitigate their impact. For regulators and policymakers, reliable forecasts of bank performance are critical to making informed decisions to maintain financial stability and promote economic growth (Jote, 2023). By understanding future trends in key performance indicators such as loan growth, return on equity and net interest margin, stakeholders in the Zambian financial industry can improve their strategic decision-making and maintain a sustainable financial ecosystem. As observed by Kurzak (2012), the goal of the forecasting system in the company is to provide information about future changes in the business environment and the impact of these changes on the company in the form of forecasts.

2.3 Forecasting methods

Danese and Kalchschmidt noted that improving the forecasting process is widely viewed as critical to achieving more accurate forecasts. Forecast accuracy is essential because significant forecast errors typically have a negative impact on the operational performance of companies, particularly in terms of costs and delivery performance (Vollmann et al., 1992; Ritzman and King, 1993; Enns, 2002; Zhao and Xie, 2002; Kalchschmidt et al., 2003). Thus, improving the forecasting process can indirectly increase operational performance by improving forecast accuracy. However, recent studies suggest

that improved forecast accuracy is not the only motivation for companies to improve their forecasting processes (Barratt and Oliveira, 2001; Smáros, 2007). Choosing the appropriate forecasting method is crucial as it directly impacts forecast accuracy. Forecast accuracy, a measure of how closely predicted values match actual results, is critical to informed decisions, efficient resource allocation, and overall organizational performance.

Choosing the right forecasting method can lead to more reliable forecasts, better planning and ultimately improved operational efficiency and competitiveness. The selection should take into account various factors such as the type of data, the forecast horizon and the degree of uncertainty. By choosing the most appropriate method, companies can improve their forecasting capabilities, improve decision-making processes and achieve better operating results.

2.4 Simple forecasting Methods

Time series methods are a fundamental group of forecasting techniques widely used in various fields for their ability to analyse and predict data points collected over time. Moving Averages (MA), Exponential Smoothing (ES) and Linear Regression are among the most applied methods in time series forecasting (Hyndman and Athanasopoulos, 2018).

The prominence of simple moving averages, exponential smoothing, and linear regression in forecasting methodologies can be attributed to several factors. Firstly, their ease of implementation and interpretation make them accessible to a wide range of users, from novices to experienced analysts (Chatfield, 2019). These methods require minimal mathematical complexity, allowing for quick application and understanding of results. Secondly, the availability of software tools, such as Excel, that support these techniques further contributes to their popularity (Gardner, 2006). Excel, being a widely used spreadsheet program, provides a familiar and convenient platform for analysts to perform forecasting tasks. Lastly, the robustness of these methods in capturing and forecasting trends in time series data adds to their appeal (Hyndman and Athanasopoulos, 2018). Despite advancements in more sophisticated forecasting approaches, the simplicity and effectiveness of these traditional methods, along with their practicality and wide acceptance in the analytical community, ensure their continued relevance and adoption in the field.

Moving Averages (MA) is a basic smoothing method used to eliminate noise and identify trends in time series data (Chatfield, 2019). It calculates the average of a specified number of past data points to create a forecast. MA is particularly useful for smoothing out short-term fluctuations and highlighting long-term trends in the data.

Exponential Smoothing (ES) builds on the concept of Moving Averages by assigning exponentially decreasing weights to past observations (Gardner, 2006). This means that recent data points are given more weight than older ones, making the method more responsive to changes in the data. ES is valuable for forecasting data with a trend or seasonal pattern.

Linear Regression is a technique for using data to identify relationships among variables and use these relationships to make predictions. Linear dependence means constant rate of increase of one variable with respect to another (Glasserman, 2001).

These methods find utility across a range of forecasting scenarios, from short-term to long-term predictions (Brockwell and Davis, 2016). They allow analysts to explore historical data patterns in a nuanced manner, providing insights into future trends and helping organizations make informed decisions.

3. Research Methodology

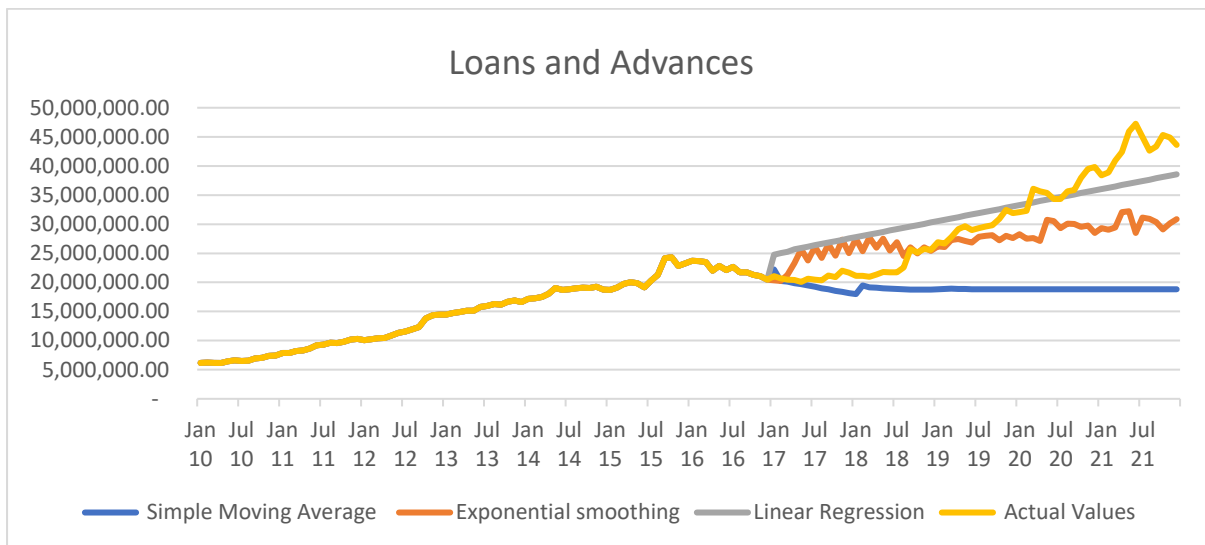
This study applies a comprehensive methodology to determine the optimal forecasting technique. It examines financial data of Zambian banks from 2010 to 2020, focusing on key performance indicators such as total deposits, total loans and advances, and total equity. These parameters are widely used in various analytical contexts. The study applies multiple forecasting techniques including simple moving averages, exponential smoothing and linear regression to produce forecasts for the years 2017 to 2021. These methods were chosen for their simplicity and accessibility in Excel, making them the most commonly used forecasting approaches.

4. Data Analysis and Results

4.1 Results

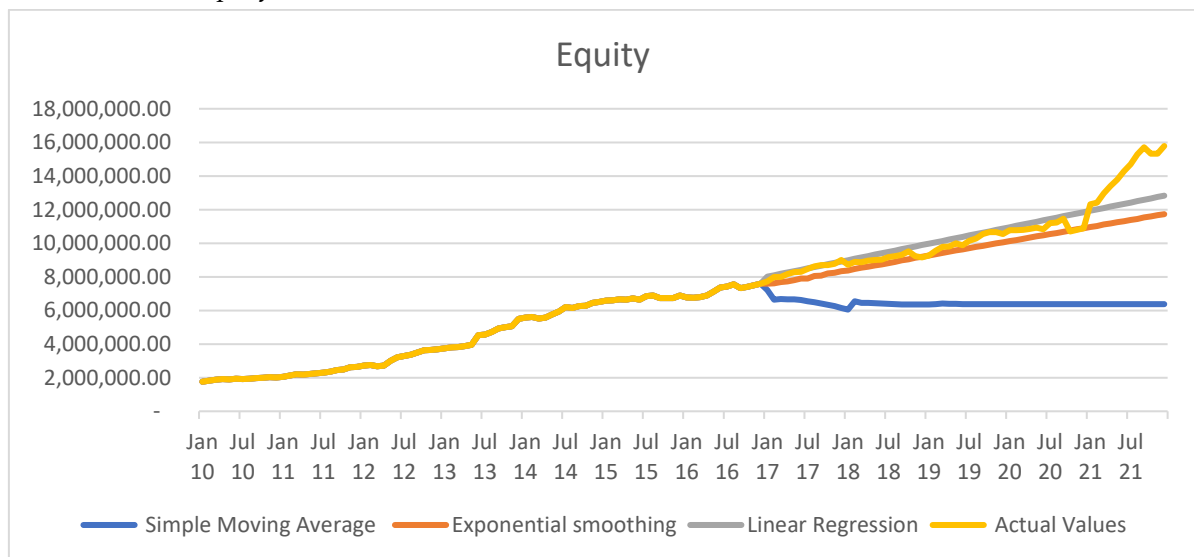
The application of various forecasting techniques results in a range of forecasts for the years 2017 to 2021. To assess the accuracy of each technique, we compare the forecast values with the actual performance data during the two-year period. The forecasting technique that has the least deviation from the actual results is considered to be the most suitable technique for predicting bank performance in the Zambian financial industry.

Table 1: Loans and Advances Forecast Vs Actual



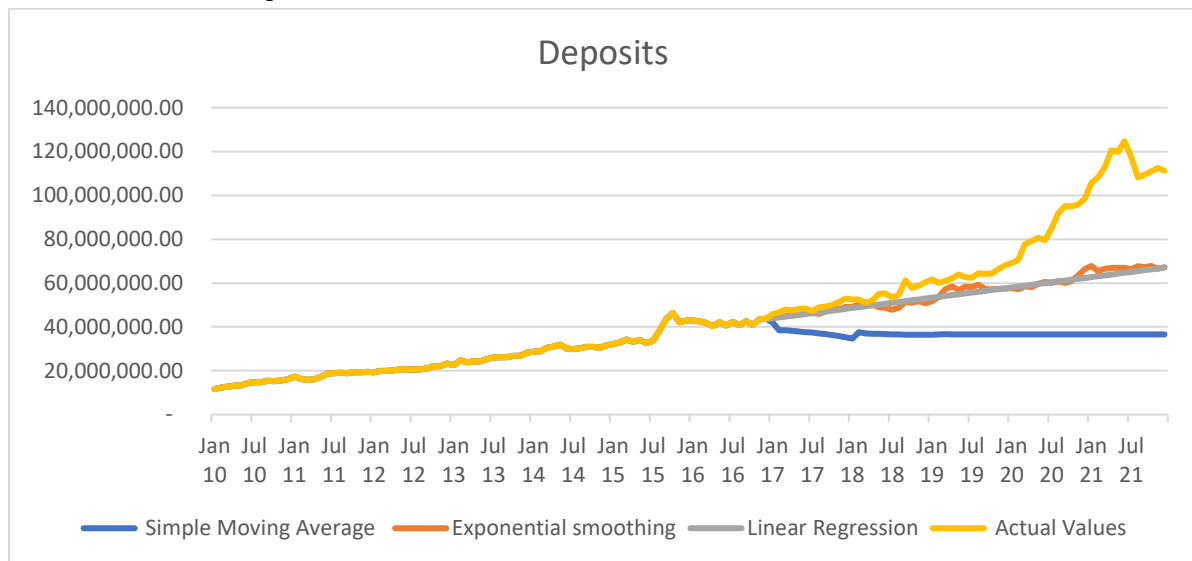
The graph above shows that the linear regression forecast is the closest aligned to the actual loans and advances.

Table 2: Equity Forecast Vs Actual



The graph above shows that the linear regression forecast is the closest aligned to the actual equity.

Table 3: Deposits Forecast vs Actual



The above graph shows that both the linear regression forecast and the exponential smoothing forecast are relatively aligned with the actual loans and advances and follow a similar trend as the actual values.

4.2 Discussion

The analysis provides valuable insights into the effectiveness of various forecasting techniques in predicting the performance of banks in Zambia's financial sector. By assessing forecast accuracy, the study can assess the suitability of simple forecasting techniques for Zambia's unique economic and regulatory landscape.

Interestingly, the results show that all forecasting methods used in this study consistently underestimated future values compared to actual results. This conservative approach has practical implications for prudent decision-making. Notably, simple linear regression consistently produced predictions that were closest to actual values. While the differences between the results of linear regression and exponential smoothing were not significant, visual inspection of the charts, particularly for equity and loans and advances, shows that linear regression outperforms exponential smoothing in terms of accuracy.

5. Implications and challenges

5.1 Practical Implications

The identification of the most effective forecasting technique carries significant practical implications for stakeholders in the Zambian financial industry:

Enhanced Decision-making: By selecting the best-suited forecasting technique, banks can improve the accuracy of their forecasts for key performance indicators. More reliable forecasts enable executives and managers to make better-informed decisions on resource allocation, product development, and strategic planning. This, in turn, contributes to the overall financial health and competitiveness of banks in the Zambian market.

Optimized Risk Management: Accurate forecasting of risks, such as credit risk and market risk, empowers financial institutions to proactively manage potential threats. With the identified forecasting technique, banks can anticipate economic downturns, market shifts, and changes in regulatory environments.

Improved Resource Allocation: Precise forecasts help banks optimize resource allocation by aligning business objectives with expected outcomes. With an understanding of future performance trends, banks can allocate capital and human resources more efficiently. Moreover, they can tailor their lending and investment strategies to capitalize on lucrative opportunities while managing exposure to potential risks.

Enhanced Regulatory Compliance: Accurate forecasts enable banks to align their financial practices with regulatory requirements more effectively. By projecting capital adequacy ratios and liquidity levels, banks can ensure compliance with regulatory guidelines.

Strategic Planning and Competitive Advantage: The identified best forecasting technique empowers banks to develop more robust strategic plans. The ability to anticipate market trends and adapt to changing conditions enhances their competitive advantage. By staying ahead of competitors, banks can attract more customers, expand their market share, and achieve sustainable growth.

5.2 Modern Advancements and Challenges

The article acknowledges the influence of modern technological advancements, such as machine learning and big data analytics, on the field of quantitative forecasting. While these innovations offer enhanced predictive capabilities, challenges related to data quality, model interpretability, and overfitting are also acknowledged. As technology continues to evolve, practitioners must navigate these complexities to harness the full potential of advanced forecasting methodologies.

6. Conclusion

In summary, selecting an appropriate forecasting method is crucial to predict the performance of banks in the Zambian financial sector, improve decision-making processes,

optimize risk management strategies and achieve sustainable long-term success. The analysis conducted above shows that among the commonly used simple forecasting methods, linear regression produces results that closely match the actual results. This means that by using linear regression for forecasting, stakeholders can effectively address the challenges of the dynamic financial environment and position themselves for lasting growth and competitive advantage. The accurate forecasts derived from this method contribute significantly to the stability and prosperity of Zambia's financial ecosystem. In addition, the results suggest that although linear regression produces results that are not only closest to actual values but also sufficiently precise for informed decision making, the moving average method is ineffective for forecasting because its results differ significantly from the actual values.

However, it is worth noting that several researchers have pointed out that simply adopting forecasting techniques does not guarantee high forecasting accuracy. Danese and Kalchschmidt (2011) noted that studies of forecasting should also address other important issues related to the management and organization of the forecasting process (Armstrong, 1987; Mentzer & Bienstock, 1998; Moon et al., 2003).

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