



# Unveiling the Bright Prospects for Forecasting the Financial Strength of the National Board of Zakat (BAZNAS) in Indonesia

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**Abstract**— This study aims to forecast the financial soundness of the National Board of Zakat (BAZNAS) in Indonesia. The data is taken from the financial reports of six BAZNAS from 2017 – 2021. The data from 30 Observations are divided into training and test data sets by using an 80:20 ratio. Based on the result of the study, it can be seen that there is a tendency to decrease the level of BAZNAS's financial soundness using the current ratio of about 13,57% and 3,40% in 2023 and 2024 and a tendency to increase continuously about 3% from 2025 to 2030. In quick ratio, a tendency to decrease about 1-4 % in 2023-2025 and a stagnancy during the period 2024-2025. Thus, a tendency to increase continuously by about 3 % in 2026-2030. Meanwhile, the Cash Ratio there is a tendency to decrease by about 5,77% and 14,27% in 2023 and 2024. But there is a big tendency to increase during 2025 by about 14,22% and 33,99 % in 2026 and there is a tendency to increase by about 1% continuously from 2027 until 2030

**Keywords**— Forecasting; Financial Soundness; BAZNAS; Multiple Linear Regression; Artificial Neural Network

## I. INTRODUCTION

Establishing zakat is crucial to ensuring social welfare and economic justice for all citizens. [1] To reinforce the state's economic cycle, it is a community-driven economic stimulus that significantly increases the growth of local enterprises. When seen in a macro sense, zakat could increase demand by motivating more people to purchase things, especially those with low incomes and those in need. The rate of unemployment and poverty is naturally lowered as a result. [2] The potential value of zakat in Indonesia is Rp. 13.529 trillion in 2021, and this figure comprises prospective zakat contributions from a variety of sources, including zakat in homes, private businesses, public enterprises, and deposits and savings.[3]

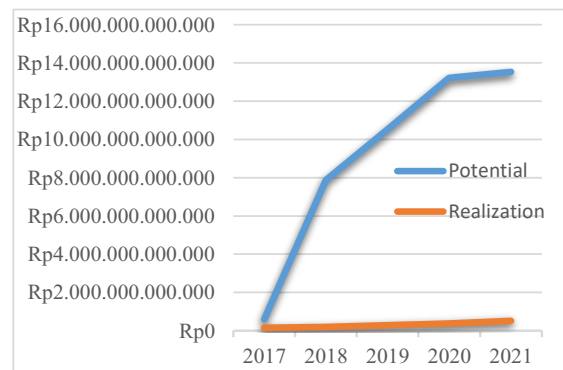


Fig. 1. Potential and realization of Zakat Collection

## II. DATA

Secondary data from various Indonesian BAZNAS institutes were used in this study. secondary data derived from the financial reports of several Indonesian BAZNAS provinces. Comparatively, the data used range from 2017 to 2021 and are secondary data with quantitative data kinds.[4]

Cluster sampling was the method employed to gather the sample data. The total population is separated into clusters or groups in a two-step procedure called cluster sampling, typically consisting of geographical areas or districts like villages, schools, wards, blocks, etc. It is the approach that will work best in a comprehensive nationwide survey. In cases where the population is dispersed widely, cluster sampling is advantageous. However, choosing a representative sample from all the components is impractical.[5]

34 Indonesian BAZNAS Provinces make up the study's sample. The cluster sampling technique applied in this study makes sure that at least six observations were collected from the 34 BAZNAS. Sumatera, Jawa, Kalimantan, Sulawesi, and Papua are the five largest islands in Indonesia, and 6 BAZNAS were used as a sampling from those islands. BAZNAS West Java, BAZNAS Riau, BAZNAS Papua, BAZNAS North

Sumatera, BAZNAS Southeast Sulawesi, and BAZNAS South Kalimantan as the sample.[6]

Multiple Linear Regression and Artificial Neural Network (ANN) approaches, processed by Matlab R2022b and MS Excel, were used in the data analysis. To simulate non-stationary, non-linear, and extremely complicated datasets, artificial neural networks (ANNs) are mathematical constructions that were inspired by the work and operation of biological neurons. The usage of neural networks in banking has grown to be one of the most used non-linear specifications [7] Neural Networks and other machine learning algorithms are now required for fraud detection, information extraction, and credit risk assessment due to the expansion of the financial sector and the financial services offered. ANN is at the forefront of scientific research due to this characteristic and the rising computer capacity.[8]

Using Data Envelopment Analysis (DEA), Parisi [9]assessed the Zakat Management organization's financial position. Based on the effectiveness and capacity of the Zakat Institutions, Harto, Anggraeni, and Bayinah [10]evaluated the performance of the Zakat Institutions using the International Standard of Zakah Management (ISZM). The results of both research suggest that contribution monies could be managed arbitrarily without any framework for assessing operational effectiveness or financial soundness.

This viewpoint was furthered by Anwar et al. [11]research showed that the five Zakat Institutions under investigation were not effective in managing the output and were not making the best use of the available resources. Furthermore, Prayogi [12]said that the performance of BAZNAS in South Tangerang City with an index approach national zakat targeted at the government and community was in poor shape. Although BAZNAS Yogyakarta fared remarkably well in its administration, Lubis dan Budiman [13 ] revealed this. Due to the lack of research measuring the impact of financial elements such as activity ratios, efficiency ratios, liquidity ratios, and growth ratios on the health or financial performance of Zakat Institutions in Indonesia, previous studies [14], [15] only partially analyzed the ratio of activity and efficiency. as no studies measured the influence of financial factors such as activity ratios, efficiency ratios, liquidity ratios, and growth ratios on the health or financial performance of Zakat Institutions in Indonesia.

Since the data will be used to answer research questions or test hypotheses, gathering data is a crucial step in the research process.[16]

Data for this study was gathered from secondary sources, such as yearly reports from institutions. The official annual reports were adequate to back up this investigation. The search and processing of necessary data through existing data, typically in the form of statistical data, agenda activities, policies, and other topics linked to research, were the documented methods employed to gather secondary data for this study. Data that is easily accessible, cost-effectiveness, and labor efficiency are some benefits of documentation approaches.[17]

III. METHOD

Artificial Neural Network

This neural network simulates the functioning of the brain. The Neural Network is built using connections between nodes that represent the brain's neurons, much as the brain is made up of the connections of many different neurons. Using the weight value, the neural network simulates neuron associations, the key brain mechanism. [18]

Three layers—input, hidden, and output—each with nodes, make up a standard ANN typology. The input layer is the first layer in every neural network, and its thickness is determined by the amount of explanatory variables (inputs) that are present. The output layer, the final layer, has nodes equal to the number of response variables (forecasts). The complexity of the model fit is defined by the nodes in a hidden layer that lies between the input and output layers.[18] Most neural network topologies have an additional node called the bias node in the input and the first hidden layer. In conventional regression models, the bias node, which has a fixed value of 1, serves as an intercept. Each node in one layer has connections (weights) with all or a subset of the nodes in the subsequent layer. [18]

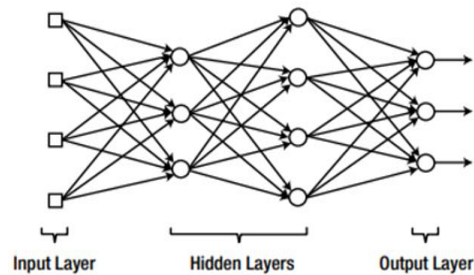


Fig.2. A layered structure of the node

IV. EMPIRICAL ANALYSIS

In forecasting using the Artificial Neural Network method, calculations are performed to obtain the forecasting value of each variable first. In this research, each forecasting is done by the Multiple Linear Regression method. Furthermore, these values are entered into the calculation of the artificial neural network model so that the following results are obtained. The research objective aims to forecast financial health by implementing a neural network using the backpropagation method, the forecast results for 2022-2030 are as follows

A. Current Ratio

Table 1 Current Ratio Forecasting Results

Year	Financial Soundness BAZNAS
	Current Ratio
2022	Rp5.081.854.035
2023	-Rp4.560.638.237
2024	-Rp1.128.389.680
2025	Rp1.118.557.109
2026	Rp2.677.518.793
2027	Rp3.795.185.818

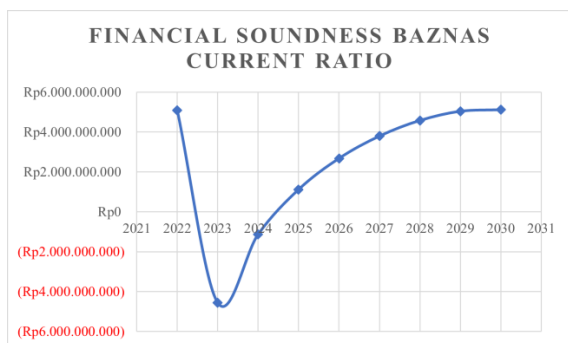
2028	Rp4.577.260.242
2029	Rp5.037.480.979
2030	Rp5.115.026.862

Source: Ms. Excel & Matlab R2022b

Based on the table of forecasting results, it can be seen that there is a tendency to decrease the level of BAZNAS's financial soundness using the Current Ratio approach in 2022-2023 and a tendency to increase continuously in 2024-2030.

If you compare the value of forecasting results every year, then the graph will be as follows.

Fig. 1 Graph of Current Ratio Forecasting Results



Source: Ms. Excel & Matlab R2022

The forecasted values of the current ratio as one of the ratios of financial soundness in 2022 will be Rp5.081.854.035 about 15,35% and there is a decrease in the level of BAZNAS's financial soundness using the current ratio will -Rp4.560.638.237 about 13,78% and -Rp1.128.389.680 about 3,40% on 2023 and on 2024. Thus, in 2025 there is a tendency to increase Rp1.118.557.109 by about 3,30% and to continue in 2026 Rp2.677.518.793 mark up by about 8,00%, and in 2027 increase continuously by about 3% will be Rp3.795.185.818 about 11,46% and on 2028 also tend to increase will be Rp4.577.260.242 strength in 13,83% and continuing in 2029 will up 2% in 15,22% about Rp5.037.480.979 and the last year in forecasting on 2030, there is a tendency growth up 0,23% in 15,45%. About Rp. 5.115.026.862

**B. Quick Ratio**

Table 2. Quick Ratio Forecasting Results

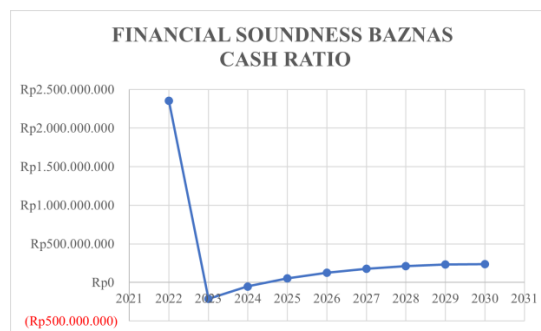
Year	Financial Soundness BAZNAS
	Quick Ratio
2022	Rp137.648.592
2023	Rp907.226.599
2024	Rp673.166.622
2025	Rp 522.736.576
2026	Rp 515.090.632
2027	Rp 683.008.351

2028	Rp 683.008.351
2029	Rp 795.092.660
2030	Rp 861.302.241

Source: Ms. Excel & Matlab R2022b

Based on the table of forecasting results, there is a tendency to decrease the level of BAZNAS's financial soundness with the Quick Ratio approach in 2023-2025 and a tendency to increase continuously in 2026-2030. If you compare the value of forecasting results every year, then the graph will be as follows

**Graphs of Cash Ratio Forecasting Result**



Source: Ms. Excel & Matlab R2022b

The forecasted values of quick ratio as one of the ratios of financial soundness in 2022 will be Rp137.648.592 about 2,38% and there will be an increase in the BAZNAS's financial soundness using quickratio will Rp 907.226.599 about 15,70% and decrease about 4% in 11,64% will -Rp 673.166.622 about 3,40% on 2023 and 2024. Thus, in 2025 there is a stagnant about 11,64% and to continue in 2026 will Rp 515.090.632 mark up about 9,04% and in 2027 decrease by about 1% to 8,91% will Rp 683.008.351 and in 2028 also tend to increase will be Rp 683.008.351 strength in 11,82% and continuing with stagnant in 2029. And the last year in forecasting 2030, there is a tendency growth up 02,6% to 3,76%. about Rp 861.302.241.

**C. Cash Ratio**

Year	Financial Soundness BAZNAS
	Cash Ratio
2022	Rp 2.352.828.956
2023	-Rp 210.765.373
2024	-Rp52.089.540
2025	Rp51.916.083
2026	Rp124.087.490
2027	Rp175.837.118
2028	Rp 212.052.869
2029	Rp 233.366.203
2030	Rp 236.961.099

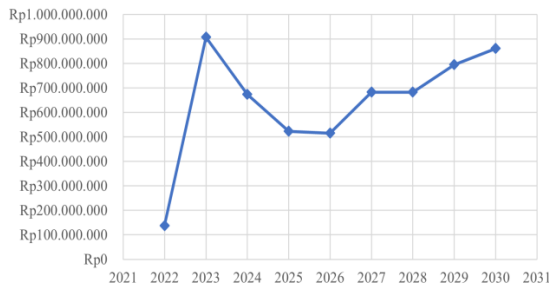
Source: Ms. Excel & Matlab R2022b

Based on the table of forecasting results, there is a tendency to decrease in the level of the financial soundness of BAZNAS using the Current Ratio approach in 2022-2024 and a tendency to increase continuously in

2025-2030. If you compare the value of forecasting results every year, then the graph will be as follows.

#### Graph of Quick Ratio Forecasting Results

##### FINANCIAL SOUNDNESS BAZNAS QUICK RATIO



Source: Ms. Excel & Matlab R2022b

The forecasted values of cash ratio as one of the ratios of financial soundness in 2022 will be Rp 2.352.828.95 about 64,46% and there is a decrease in BAZNAS's financial soundness using cash ratio will -Rp210.765.373 about 5,77% and Rp52.089.540 about 14,27% in 2023 and 2024. Thus, in 2025 there is a tendency to increase in the same value will Rp51.916.083 about by 14,22% and to continue in 2026 will Rp124.087.490 mark up about 33,99 %, and in 2027 decrease too much by about 31% in 4,81% will be Rp Rp175.837.118 and on 2028 also tend to increase will be Rp 212.052.869 strength in 5,80% and continuing in 2029 will up 1% in 6,39 % about Rp 233.366.203. And the last year in forecasting 2030, there is a tendency growth up 0,10% in 6,49%. about Rp 236.961.099 about 64,46% and there is a decrease in BAZNAS's financial soundness using cash ratio will -Rp210.765.373 about 5,77% and Rp52.089.540 about 14,27% in 2023 and 2024. Thus, in 2025 there is a tendency to increase in the same value will Rp51.916.083 about by 14,22% and to continue in 2026 will Rp124.087.490 mark up about 33,99 %, and in 2027 decrease too much by about 31% in 4,81% will be Rp Rp175.837.118 and on 2028 also tend to increase will be Rp 212.052.869 strength in 5,80% and continuing in 2029 will up 1% in 6,39 % about Rp 233.366.203. And the last year in forecasting 2030, there is a tendency growth up 0,10% in 6,49%. about Rp 236.961.099.

#### CONCLUSION

Based on the result of the study, it can be seen that there is a tendency to decrease the level of BAZNAS's financial soundness using the current ratio of about 13,57% and 3,40% in 2023 and 2024 and a tendency to increase continuously about 3% from 2025 to 2030. In quick ratio, a tendency to decrease about 1-4 % from 2023-2025 and a stagnation during a period on 2024-2025. Thus, a tendency to increase continuously about 3 % on 2026-2030. Meanwhile, Cash Ratio there is a tendency to decrease about 5,77% and 14,27% on 2023 and 2024. But there is a big tendency to increase during 2025 about 14,22% and 33,99 % on 2026 and there is a tendency to increase about 1% continuously on 2027 until 2030.

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