**Predictive Modeling of Total Deposits and Investments in the Islamic Banking Sector in Bangladesh**

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**Abstract**: In the last few years, the Islamic banking industry in Bangladesh has experienced a dramatic growth in terms of playing an important role within the financial system. The study aims to present a predictive modeling of total deposits and total investments in the Islamic banking sector, analyzing through time series data the trend, patterns, and future projection. Monthly data are gathered from key Islamic banking indicators, including full-fledged Islamic banks, Islamic banking branches of conventional banks, and Islamic banking windows, for accuracy and reliability. The statistical methods used in developing predictive models for the future behavior of deposits and investments include ARIMA and exponential smoothing techniques as well as time series analysis. Results have shown a significant upward trend both in deposits and investments, with full-fledged Islamic banks contributing the largest to the growth of the sector. The study also identifies periodic fluctuations influenced by seasonal factors like the inflow of remittances, economic cycles, and external trade activities. The predictive models show strong fitness that can be very helpful for policymakers, bank management, and investors to draw strategies on resource allocation, financial planning, and sustainable growth in Islamic banking. This research augments the existing literature in the area by providing a robust forecast and highlighting some of the key drivers of growth in the Islamic banking sector of Bangladesh.

**Keywords**:Islamic banking, total deposits, total investments, predictive modeling, ARIMA, Bangladesh, time series analysis.