The Financial Performance Implications of Adopting Technologies by Banks: A K-Means Clustering and Markov Chain Approach

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ABSTRACT

This study examines the financial performance or profitability implications of adopting technologies such as ATM, NEFT and PoS devices by Indian Commercial Banks. It first characterizes the degrees of these technologies adopted by these banks and then identifies if they have a good financial performance by using k-means clustering, a popular machine learning method. The impact of technology on banking performance is significant if we keep a loser criteria of analyzing the impact every 5 years rather than a very strict criteria of checking yearly. It also looks at the combinations of the technology and performance indicators that help in identifying a positive relationship between the two. It looks at the trajectory a bank takes in terms of its states of technology and financial performance. This would be helpful in policy making by the banks for their further investment in technology. A bank that has less technology levels remains in that state throughout and same for high technology indicating certain degree inertia in adoption of technology. Similar results are found for bank performance. There is a direct relationship between the technology indicators of ATM, PoS and NEFT and profitability indicators of ROA and NIM but an inverse relationship between these technology indicators and the profitability indicator ROE.