

A SYSTEMATIC LITERATURE REVIEW ON ANALYSING THE PERFORMANCE OF COMMERCIAL BANKS USING MCDM APPROACHES

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ABSTRACT

A commercial bank is a for-profit financial institution that lends loans, receives deposits, and delivers other financial services to consumers. Commercial banks serve the short- and long-term financial needs of businesses. The PRISMA methodology was used to conduct a systematic literature review (SLR) for this investigation, which involved identifying several relevant and appropriate types of literature to examine the effectiveness of commercial banks as determined by many criteria. The vast majority of the information was found on Google Scholar. 16 papers that are pertinent to this study exist. Additionally, a qualitative method of data analysis was used to describe the research findings. The objective of the study, the criteria, and the technique are the three key research themes that have been highlighted. According to the examination of these publications, banks are still judged on their performance using the Multi-Criteria Decision Making (MCDM) methodology. The performance of banks may also be evaluated using a wide range of factors. The banks are anticipated to perform better as a result of these results. The results of SLR opened a discussion on crucial future study fields by illuminating the key contribution gaps and opportunities in the field.

Keywords: Banks performance, Multi-Criteria Decision Making (MCDM)

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1. Introduction

All Banks are essential to the economic development of a nation since they regulate the quantity of money in circulation and serve as a key engine for economic growth. Economic development is a dynamic and continuing process that heavily depends on resource mobilisation, investment, and the operational effectiveness of different economic divisions (Estrada et al., 2010). The banking industry is a key component of the contemporary economy; hence its effectiveness is essential. A sound financial system and economy need comprehensive evaluation and analysis of banks (Muhammad Ghazali et al., 2022). Reviewing, assessing, and categorising the current research on analysing bank performance using the Multi-Criteria Decision Making (MCDM) technique are the main goals of this work.



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This SLR looks at research trends and pinpoints studies that have similar objectives, standards, and methodologies. The themes of this study are shown in Table 1.

Table 1: Themes of this study.

No.	Themes
1	Purpose of the study
2	Criteria
3	Methodology

Insight into a bank's competitiveness in the market, as well as prospects for development, are revealed by the performance evaluation of a bank, which yields a significant result for many stakeholders including investors and creditors (Marjanović & Popović, 2020). It evaluates a number of crucial measures and indicators that demonstrate the bank's capacity to draw in new business, keep existing clients satisfied, and provide market-leading goods and services, among other things. A framework for bank comparisons including the examination of many criteria may be provided by MCDM. Numerous MCDM techniques for assessing and choosing options have been created in the past (Ecer, 2015).

2. Literature Review

A method for making decisions when there are several, frequently at-odds factors to consider is known as multi-criteria decision-making (MCDM). MCDM is a well-liked research subject that has produced a number of theoretical findings (Roy et al., 2005). To find a preferred option, group alternatives into a small number of categories, or rank alternatives according to preference, MCDM procedures were developed. When there are several competing factors, the MCDM approach is a catch-all term for all methods of supporting people in making decisions based on their preferences (Ho, 2008). Multi-Attribute Decision Making (MADM) and Multi-Objective Decision Making (MODM) are two subcategories of the MCDM approach (Mota et al., 2013).

The MCDM technique provides a number of benefits over other decision-support strategies. To begin with, the MCDM technique acknowledges that decision-making is a complex process and aids in structuring decisions according to reason (De Felice, 2012). The decision maker (DM) in the MCDM approach can use their discretion when determining the best choice by allocating performance scores and weights (Achillas et al., 2013). Additionally, the MCDM technique may investigate alternatives based on a number of criteria that are assessed in both quantitative and qualitative units. Then, using the MCDM technique, it is possible to identify the one most preferred alternative, shortlist alternatives for further consideration, rate different alternatives, and differentiate between desirable and unacceptable possibilities (Achillas et al., 2013).

The MADM approach is a technique for handling issues where choosing from a small pool of potential solutions is necessary. This method describes how the attributes' information will be analysed in order to decide (Venkata Rao, 2007). It has been recognised as a multidisciplinary methodology for resolving issues, particularly issues related to the decision-making process, in a variety of fields including management science, social sciences, eight engineering issues, and economics. Inter- and intra-attribute comparisons and assessments, as well as unambiguous trade-offs, are required for MADM techniques (Venkata Rao, 2007). This approach originally was not able to meet all of the demands of the DM, but as a consequence of these needs, it has progressed greatly in recent years, adding more distinct

research with a new paradigm and a dynamic viewpoint and trend (Hashemkhani Zolfani et al., 2016).

This systematic literature review is a methodical and open way to summarise the data on a particular research issue or subject. It entails gathering several research studies and evaluating them critically to produce an extensive review of the existing literature. SLR as opposed to conventional narrative reviews, uses a reproducible, scientific, and open production process. In order to fully address a certain research subject, it is beneficial to compile all relevant works and papers that meet our pre-established inclusion criteria. To reduce the likelihood of bias during the search, identification, assessment, synthesis, analysis, and summary of research, it employs clear-cut and methodical techniques (Mengist et al., 2020). According to Xiao & Watson (2017), literature reviews should be trustworthy, reproducible, and legitimate as scientific investigations. Because we seldom address the technique for literature reviews and do not give enough instructions on how to perform efficient reviews, the planning field lacks robust systematic reviews.

3. Research Methodology

In order to gather, identify, analyse, and synthesise numerous works on mathematics mobile applications in education, this study employed the systematic literature review (SLR) methodology. SLR is a type of literature review that is closely related to a set of scientific procedures in order to prevent systematic or biased mistakes (Kwon & Lee, 2019). According to Peter et al. (2019) advice for the preferred reporting items for systematic reviews and meta-analysis, or PRISMA, this work employs many steps. Identification, screening, eligibility, and inclusion are these steps. Figure 1 below demonstrates the systematic process used to respond to this research topic. Additionally, 16 articles were further examined depending on the outcomes of the data search as shown in the chart above. Table 2 provides a summary of the articles.

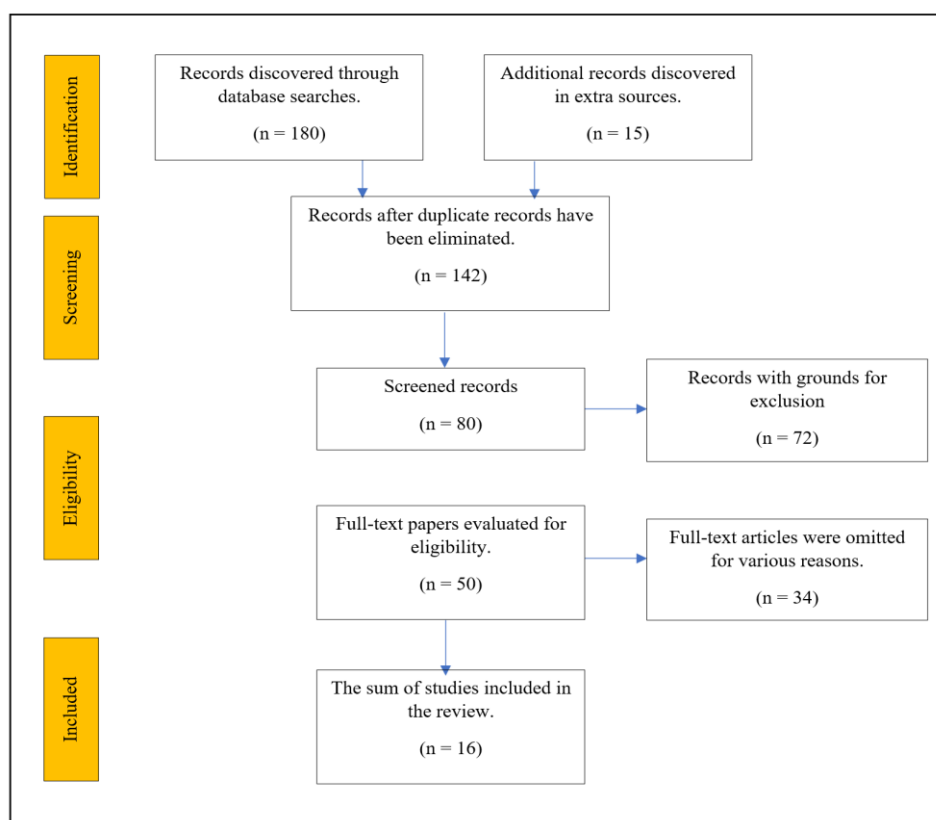


Figure 1: Selection Flow

Table 2: Identity of the articles

No	Article Title	Year	Author's Name	Journal Name
1	Measuring the Performance of Participation Banks by TOPSIS Method: Turkey and Malaysia Cases	2016	Abdurrahman Gümrah	International Journal of Business and Management Studies
2	Financial Performance of Malaysia Local Banks: During Periods of Pre-Merger and Post-Merger	2015	Khong Yeen Lai, Tee Peck Ling, Tan Kok Eng, Low Suet Cheng, Lim Fung Ting	Journal of Economics, Business and Management
3	Determinants of Local Commercial Banks' Performance in Malaysia	2018	Lee Wee Jeng, Suganthi Ramasamy, Devinaga Rasiah, Peter Yuen Yee Yen, Shalini Devi Pillay	International Journal of Engineering & Technology
4	Financial Analysis on the Company Performance in Malaysia with Multi-Criteria Decision Making Model	2016	Liew Kah Fai, Lam Weng Siew, Lam Weng Hoe	Systems Science and Applied Mathematics
5	Ranking of Malaysian Commercial Banks: Super-Efficiency Data Envelopment Analysis (DEA) Approach	2015	Rossazana Ab Rahim	Asian Academy of Management Journal of Accounting and Finance

6	The Performance of Two Anchor Domestic Malaysian Banks before and after Acquisition	2017	Jakpar, S., Tinggi, M., Chong, W. T., Johari, A., Myint, K. T.	International Business Research
7	Board Characteristics and Bank Performance in Malaysia	2021	Zuriawati Zakaria, Noorfaiz Purhanudin, Noor Azizah Shaari, Kuah Yoke Chin	International Journal of Empirical Finance and Management Sciences
8	On intellectual capital and financial performances of banks in Malaysia	2018	Poh, Law Teck; Kilicman, Adem; Ibrahim, Siti Nur Iqmal	Cogent Economics & Finance
9	The Profitability of Islamic and Conventional Bank: Case Study in Malaysia	2016	Hamidah Ramlan, Mohd Sharrizat Adnan	Procedia Economics and Finance
10	Financial Performance Analysis of Banks with Topsis and Fuzzy Topsis Approaches	2020	Yuksel Akay UNVAN	Journal of Science
11	Camels and Performance Evaluation of Banks in Malaysia: Conventional Versus Islamic	2013	Nabilah Rozzani, Rashidah Abdul Rahman	Journal of Islamic Finance and Business Research
12	Intellectual Capital and Firm Performance of Commercial Banks in Malaysia	2012	Malina Hanum Mohd Kamal, Rosfatihah Che Mat, Najihah Abdul Rahim, Norhusniyati Husin, Irwan	Asian Economic and Financial Review

			Ismail	
13	Efficiency of Commercial Banks in Malaysia	2006	Mohd. Azmi Omar, Abdul Rahim Abdul Rahman, Rosylin Mohd. Yusof, M. Shabri Abd. Majid, Mohd. Eskandar Shah Mohd. Rasid	Asian Academy of Management Journal of Accounting and Finance
14	Financial Performance of Islamic and Conventional Banks in Malaysia: A Comparative Analysis	2019	Yasin Ahmed Sulub, Marhanum Che Mohd Salleh	International Journal of Management and Applied Research
15	Efficiency of Banks in Malaysia: A Super Efficiency Approach	2019	Maznah Mat Kasim, Razamin Ramli, Md. Azizul Baten, Jastini Mohd Jamil, Mushtaq Taleb	Inzinerine Ekonomika-Engineering Economics
16	The Performance of Banking During 2000-2009: Bank Islam Malaysia Berhad and Conventional Banking in Malaysia	2011	Mohamad Abdul Hamid, Shaza Marina Azmi	International Journal of Economics and Management Sciences

4. Data Collection and Analysis

Electronic databases like Google Scholar were used to obtain data sources for this study. In data searches, a number of keywords are employed, including MCDM, the performance of banks, commercial banks, and criteria of banks. The chosen papers are ones that have appeared in credible scientific journals. The information gathered from the papers used in this investigation is displayed in Table 3 below.

Table 3: Data collected from the articles.

No	Article Title	Purpose of the Studies	Criteria	Methodology
1	Measuring the Performance of Participation Banks by TOPSIS Method: Turkey and Malaysia Cases	This study focuses on the TOPSIS multi-criteria decision-making method to assess the financial performance of participating banks operating in Malaysia and Turkey.	Profit, Liquidity, Debt Capacity, Share Capital	TOPSIS
2	Financial Performance of Malaysia Local Banks: During Periods of Pre- Merger and Post- Merger	The article tries to look into the level of efficiency and financial performance of Malaysian local banks following the merger and acquisition of the banking industry in 2000.	Return on Asset, Return on Equity, Loan to Deposit, Expense to Income, Expense to Total Asset, Loan to Deposit, Earnings per Share, Dividends per Share,	DEA
3	Determinants of Local Commercial Banks' Performance in Malaysia	This study studied the factors that affected the performance of Malaysian local commercial banks.	Credit Risk, Liquidity Risk, Bank Size, Capital Adequacy,	POLS
4	Financial Analysis on the Company Performance in Malaysia with Multi-Criteria Decision Making Model	The purpose of this study is to use the TOPSIS model to evaluate, compare, and rate the overall performance of the financial sector companies listed on the Malaysian stock exchange.	Current Ratio, Return on Equity, Profit Margin, Debt to Equity Ratio, Earnings per Share, Price Earnings Ratio	TOPSIS

5	Ranking of Malaysian Commercial Banks: Super-Efficiency Data Envelopment Analysis (DEA) Approach	The purposes of this study are to calculate the super-efficiency index and the technical efficiency of Malaysian commercial banks from 2000 to 2010.	Bank Efficiency	DEA
6	The Performance of Two Anchor Domestic Malaysian Banks before and after Acquisition	The article is to evaluate the effectiveness of indigenous Malaysian banks both before and after acquisition	Debt Ratio, Return on Asset, Return on Equity, Earnings per Share	Financial Ratios, Event Study
7	Board Characteristics and Bank Performance in Malaysia	This study looked at how board attributes such size, independence, average age, audit committee meetings, board meetings, and board diversity affected the performance of the bank in Malaysia.	Return on Asset, Return on Equity, Net Interest Margin, Bank Size, Bank Liquidity,	Descriptive Analysis
8	On intellectual capital and financial performances of banks in Malaysia	The goal of the study is to evaluate and quantify the contribution of intellectual capital to the financial results of Malaysian local banks	Return on Asset, Return on Equity, Leverage	VAIC
9	The Profitability of Islamic and Conventional Bank: Case Study in Malaysia	The purpose of this study is to compare and contrast the profitability of Islamic and conventional banks in Malaysia.	Total Equity to Total Assets, Total Loans to Total Assets, Deposits to Total Assets, Return on Asset,	T-Test Regression

			Return on Equity	
10	Financial Performance Analysis of Banks with Topsis and Fuzzy Topsis Approaches	This study focuses on the effective and efficient functioning of banks by identifying the indicators of performance and weights that will be used.	Liquidity, Asset Ratio, Profitability Ratio, Income Expense Structure Ratio	TOPSIS, Fuzzy TOPSIS
11	Camels and Performance Evaluation of Banks in Malaysia: Conventional Versus Islamic	This research focuses on the CAMELS ratings to investigate the performance of banks, with the primary goal being to assess both conventional and Islamic banks currently functioning in Malaysia.	Capital Adequacy, Asset Quality, Earnings Quality, Liquidity, Management Quality, Shariah Compliance	CAMELS Rating
12	Intellectual Capital and Firm Performance of Commercial Banks in Malaysia	The aim of this article is to ascertain the link between the performance of commercial banks and the degree of intellectual capital efficiency in terms of human capital, capital employed, and structural capital (VAIC).	Return on Asset, Return on Equity	VAIC
13	Efficiency of Commercial Banks in Malaysia	This study looks into how Malaysia's commercial banks' productivity changed between 2000 and 2004.	Banks Efficiency	DEA

14	Financial Performance of Islamic and Conventional Banks in Malaysia: A Comparative Analysis	This study focuses on the difference in the financial performance of Islamic and conventional banks in Malaysia within the framework of a dual- setting structure in the country's financial sector.	Return on Asset, Return on Equity, Debt Ratio, Earnings per Share	Financial Ratios, VAR
15	Efficiency of Banks in Malaysia: A Super Efficiency Approach	This study focuses on using DEA models to assess banks' efficiency without rating the totally efficient banks because those banks have the same efficiency score.	Banks Efficiency	DEA
16	The Performance of Banking During 2000-2009: Bank Islam Malaysia Berhad and Conventional Banking in Malaysia	The purpose of this paper is to compare Malaysia's interest-free Islamic bank (BIMB) with the interest-based traditional commercial banks in terms of their financial performance	Profitability Ratio Liquidity Ratio	T-Test

5. Results and Discussion

a) Purpose of study

In connection with this SLR, the three main steps of data analysis are the targeted banks, the criteria, and the methodologies for ranking the banks. Specify the precise banks that will be the subject of the review in the first step of the data analysis. Subsequently deciding on the standards or criteria to be used to evaluate the banks. These standards are used as the foundation for evaluating the performance of the banks and are often chosen to reflect the most important facets of their operations and establish the methods or procedures for grading the banks according to the chosen standards. Depending on the intricacy of the study and the data's accessibility, many approaches could be used. The majority of the articles rate the bank's efficiency using pre-established standards. Some articles discuss the methodology used to evaluate and contrast the banks, while others focus on the criteria that were utilised. We may infer that the majority of research evaluates banks according to their efficacy and efficiency.

b) Criteria

Table 4: Criteria of the banks.

Criteria	Number of articles (n)
Return on Equity (ROE)	7
Return on Asset (ROA)	6
Profit	5
Debt	5
Liquidity	5
Earnings per Share	4
Bank Efficiency	3
Bank Size	3
Capital Adequacy	2
Expenses	2
Loan to Deposit	2
Share Capital	1
Management Quality	1
Leverage	1
Shariah Compliance	1

The table above lists the many factors that have been utilised in earlier research to rank banks. A variety of characteristics and criteria can be used to rate the banks. Return on equity is the most widely used paper for analysing bank performance, with a total of 7 papers. Return on asset, however, is the second-most often used criterion in 6 articles. The bank is evaluated in the same number of articles (5 articles) based on earnings, debt, and liquidity. Management quality, leverage, and compliance to Shariah were the least important criteria. Overall, the wide variety of factors used to score banks in earlier studies illustrates how challenging it is to evaluate financial organisations' performance completely.

c) Methodology

Table 5: Methodology of the articles.

Methodology	n
DEA	4
TOPSIS	3
VAIC	2
VAR	1
POLS	1

Camels Rating	1
Financial Ratios	1
T-Test Regression	2
Descriptive Analysis	1

There are nine different methods to rank the bank's performance in these 16 articles. In comparison, three research employ the TOPSIS method and four use the DEA methodology. Only one study has been done for each method—VAR, POLS, financial ratios, and descriptive analysis. We could get to the conclusion that the DEA and TOPSIS method is an effective way to evaluate and compare banks. In summary, it has been found that the DEA and TOPSIS techniques are useful and effective instruments for assessing and contrasting banks' performance across several research investigations. Their widespread use highlights their relevance in the field of banking research and decision-making while also emphasising how crucial it is to choose the best approach depending on the particular needs of each study.

6. Conclusion

This SLR examines 16 papers that were published between the years 2006 and 2021 and were chosen based on preset criteria to assess the performance of commercial banks using MCDM techniques. This article identifies, categorises, and synthesises research findings based on research topics to present a clear picture of the SLR on MCDM in assessing the banks' performance and current trends. There are three main themes in this study which are the purpose of the study, criteria and methodology. The prior study's research was conducted using the same general criteria, including return on asset, return on equity, profit, and debt. The researchers' common methodologies for their investigation include TOPSIS and DEA. The review's relative dearth of papers to examine or discuss is one of its limitations. It is necessary to conduct a larger-scale literature review in order to generate more thorough literature review articles.

7. Acknowledgement

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9. Conflict of Interest

The authors have no conflicts of interest to declare.

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