PEARSON JOURNAL OF SOCIAL SCIENCES & HUMANITIES

ISSN: 2717-7386

DOI Number: http://dx.doi.org/10.46872/pj.533

ÜRDÜN'DE EDAS VE TOPSİS YÖNTEMİ KULLANAN İSLAM BANKALARININ FİNANSAL PERFORMANS SIRALAMASI

FINANCIAL PERFORMANCE RANKING OF ISLAMIC BANKS IN JORDAN EMPLOYING EDAS AND TOPSIS METHODS

Qabas Mohammad JARADAT
İstanbul Aydın Üniversitesi, Lisansüstü Eğitim Enstitüsü, İşletme Yönetimi
ORCID No: 0000-0002-2611-0481

Özet

Bu makale, ideale benzerlik tercih sıralama tekniğini kullanan Ürdün İslami bankalarının finansal performans sıralamasının bulgularını belgelemektedir. Önerilen yaklaşımla, incelenen bankanın finansal performansını etkileyen kriterleri belirliyoruz. TOPSIS ve EDAS yöntemleri, kriterlerin önem ağırlığının ve bankanın performans puanının belirlenmesinde kullanılmaktadır. Rapor, Ürdün'deki analiz edilen İslami bankaların EDAS ve TOPSIS performans puanlarında dalgalanmalar olduğunu keşfediyor. Bu sonuç, dikkate alınan bankaların performans istikrarsızlığını ortaya koymaktadır. Bu sonuç, günümüzün yoğun rekabet ortamında performans testinin anlamlı olduğunu göstermektedir.

Anahtar Kelimeler: İslami Bankalar, TOPSIS, Finansal Performans, EDAS

Abstract

This paper documents the findings of the financial performance ranking of Jordanian Islamic banks employing the similarity-to-ideal preference ranking technique Evaluation based on (TOPSIS) and Average Distance from Solution (EDAS) method. With the proposed approach we determine Criteria that affect the financial performance of the bank under consideration. The TOPSIS and EDAS methods are used to determine the significance weight of the criteria and the bank's performance score. The paper discovers that there are fluctuations in the EDAS and TOPSIS performance scores of analyzed Islamic banks in Jordan. This outcome demonstrates the performance instability of the considered banks. This consequence suggests that performance testing is meaningful in today's intensely competitive environment.

Keywords: Islamic Banks, TOPSIS, Financial Performance, EDAS

INTRODUCTION

One of the major research fields in banking is measuring the relative importance of banks using popular multi-criteria decision-making methods like EDAS and TOPSIS. This paper examines the productivity of Jordanian Islamic banks using EDAS and TOPSIS methods. According to many studies, only a few studies have focused on Islamic banking, especially in developing economies like Malaysia. Many studies looked at the success of Islamic banks in different Countries including the Middle East and North Africa (MENA) and Asia. The findings of those studies revealed administrative inefficiencies in bank resource management. Performance test has become an essential tool for the banking sector. The banking sector has

ISSN: 2717-7386

DOI Number: http://dx.doi.org/10.46872/pj.533

always been a significant factor in developing the national economy (Pal & Choudhury, 2009; Chen, 2000).

Decision-making is a style of approach to the situation under consideration. Determining the decision-making process the criteria depend on the decision-maker to measure and evaluate the data set. The decision approach to the data acquired in the process of making is also an essential factor that determines the decision. How to assess the owned data set is simple by whether the data is numerical or verbal. Or, it differs according to its complex nature. Simple to a numerical and complex data set, it is impossible to approach calculations and evaluations. For example, managers at the decision center of a large-scale enterprise can suddenly decide on business management have to consider many variables. One or more advanced assessment methods are needed to support the ideal solution in such cases (Borcherding et al., 1995).

The objective function in modern business management approaches is defined as ensuring the continuity of the business and maximizing the benefits of the owners and partners of the company. The nature of the relevant value is determined by the quality of the assets owned by the businesses.

Even if you demonstrate the quality of the business's assets as financial value, it is not easy to determine its continuity due to its size. In today's dynamic economic conditions, it is not enough to use only the ratios obtained from the financial statements to evaluate the enterprises. In this respect, with the existing multi-criteria decision-making methods, the criteria can conflict with each other are they have had a wide range of usage by helping to make decisions at the level of decision (Balioti et al., 2018b).

The research study (Keshavarz et al., 2015) noted that finance studies have also been conducted in the literature to reduce many analysis results to a single indicator. For example, Du-Pont Analysis, Altman Z-Score, Data membrane (but analysis, Multi-Criteria Decision Receiving Methods (AHP, TOPSIS, VIKOR, ELECTRE, PROMETHEE, etc.) are some of the developed methods. TOPSIS provides the ideal solution for multi-criteria decision making for decision points.

The banks' financial performance provides a guide to analyze the monetary outcomes of a firm, including its efficiency, performance, effectiveness, and policies. These outcomes impact profit earning, return on investment, and assets of the company. Also, the financial performance provides information about the way of exploiting the bank resources in order to generate profit. From the company's primary mode of business and revenue generation perspective, the evaluation of the financial performance is used to assess the usage of assets. It should be noted that net asset value, profit after taxes, net operating income, and earnings before taxes and interest are also included. Such performance analysis determines the overall financial condition of the firm for a certain period of time, and this is beneficial for comparing industries (Pinto et al., 2017).

The key theory is dependent on proximity to the solution. The approach helps compare alternatives based on specific parameters and the required maximum and minimum values of the criteria in the ideal case. The TOPSIS method is used mainly in the manufacturing and distribution processes. It's used in experiments to find the best chain selection solution. To assess a company's financial viability, The TOPSIS method can be used to obtain the scores

ISSN: 2717-7386

DOI Number: http://dx.doi.org/10.46872/pj.533

obtained by using financial ratios as data. The method's economic success is measured after the scores are checked for financial significance. It is possible to express a view about whether or not it can be used as a method (Ünvan, 2020).

This paper discovers and assesses the financial performance of the Jordanian Islamic banks by summarizing its contribution to the literature as follows. (i) The paper evaluates the financial performance of Jordanian Islamic banks by employing two multiple decision-making methods TOPSIS, and EDAS. (ii) It also uncovers the performance instability of the Jordanian Islamic banks. The rest of the paper is organized as follows: Section 2 discusses the literature studies by reporting their primary results. Section 3 rolls out the banking approach in Jordan. Section 4 documents the empirical analysis by denoting data, hypotheses, research methodology. Section 5 summarizes the outcomes of the analysis and our suggestions in proportion to the findings.

LITERATURE

In the literature, the measurement of bank performance has been reported. Asset and equity are the most used variables for performance evaluation (Demirgüç, 1999). Net Interest Margin (NIM) has been reported in the research study (Ongore, 2013) as a financial metric for commercial banks. It is distinguished since it considers the unemployment rate and return on unrestricted investment as proxies of macroeconomic and bank-specific factors, respectively. The Islamic Bank Profitability Competition and Other External Determinants have been discussed in the research study (Haron, 1996).

The research study (Samhan et al., 2015) showed the superiority of Islamic banks in competitive markets over the ones in a monopolistic market. Furthermore, the aforementioned study provided empirical evidence on the Islamic banks' determinants of profitability. The profitability is significantly impacted by bank size and inflation. It has been proven in (Samhan et al., 2015) that the management process is easier for banks in a competitive market as compared to others. Thus, the Muslim government should not adopt protectionist policies that can corrupt Islamic banking development.

More benefits could be given to the depositors as the number of Islamic banks increases. The research study (Haron, 1996) discussed the factors that affect the Islamic banks' profitability. The aforementioned study proposed a strong correlation between some internal factors, such as liquidity and total expenditures, and the total income of Islamic banks. Also, external factors such as bank size and market share are similarly impacted as in internal factors. Besides the internal and external factors, other determinants such as money supply and total capital and reserves impact profitability.

The research study (Khrawish et al., 2011) showed a positive relationship between return on assets (ROA) and credit facilities, and between Return on Equity (ROE) and bank size. On the other hand, there was a negative relationship between ROA / ROE and inflation rate. Also, this study showed a positive relationship between ROE and aggregate income/total assets. Furthermore, a negative relationship is observed between ROE and aggregate equity/aggregate assets.

The research paper (Ramadan et al., 2011) studied the impacts of bank-specific and macroeconomic factors on the profitability of commercial banks in Jordan. The ROA and ROE

ISSN: 2717-7386

DOI Number: http://dx.doi.org/10.46872/pj.533

have been used in (Ramadan et al., 2011) to measure the bank's profitability. The obtained results showed the impact of the characteristics of Jordanian banks on bank profitability. These characteristics include low credit risk, high credit activity, and well-capitalized banks are positively impact the Jordanian banks' profitability.

Generally, market and accounting performances measure the financial performance of firms. Market performance measures could be market return, stock performance, or market to book value. The accounting performance measures include growth, asset utilization, and profitability (Wu, 2006). These measures could be used individually or combined, for example, the research study (Graves & Waddock, 1994) evaluated the environmental performance by using accounting measures. Another example of adopting both financial and accounting measures can be found in the research study (McGuire et al., 1988). It should be noted that accounting measures are based on a historical standpoint, on the other hand, market measures are futuristic. Another difference between market and accounting measures is that market measures may not be as reliable as accounting measures (McGuire et al., 1988).

BANKING APPROACH IN JORDAN

Banks are critical for economic and social and development. However, interest-based activities in the bank are prohibited in Islam. Thus, the Islamic banks are established in order to operate based on the laws and regulations of Islam. An Islamic bank is a monetary and financial institution that offers banking and financial services by its role as a financial intermediary. In other words, it employs funds and attracts financial resources according to Sharia (Ajlouni, 2012). Islam prohibits interests payment for the money renting, and business investment in producing prohibited services or goods, such as gambling services or alcoholic drinks.

The Islamic bank definition includes several elements, the most prominent are (Obada, 2008):

Islamic bank is financial intermediary, like conventional banks.

Islamic bank offers financial services, investment deposits, and current accounts based on Islamic Sharia.

The concept of the Islamic dimension in collecting and using resources distinguishes Islamic banks from traditional ones.

The Islamic bank aims at developing justice, economic, and social solidarity.

EMPIRICAL ANALYSIS

4.1 Research Methodology

In this section, we will discuss the considered methodology to investigate the objectives of our research. This paper evaluates the financial performance of three different Jordanian Islamic banks from 2016 to 2020. More specifically, we study the impact of bank-specific factors and macroeconomic variables on bank performance. The primary objective of this research is to form a descriptive and quantitative analytical framework.

4.1.1 Research Framework

ISSN: 2717-7386

DOI Number: http://dx.doi.org/10.46872/pj.533

The considered Bank-specific factors are gross income / total assets, capital adequacy ratio, leverage and liquidity ratio. Moreover, ROA and ROE variables are used as proxies for financial performance. In the following, we will discuss the bank-specific factors.

Total pay separated by absolute resources: complete pay from the pay articulation is isolated by all-out resources from the accounting report. The research study (Haron, 1996) tracked down a huge and positive connection between this proportion (total income/total asset) and ROA as well as ROE.

Equity proportion implies that all-out investors' value, in addition to minority premium, is partitioned by all-out resources. The research study (Khrawish et al., 2011) tracked down a critical and positive connection between value proportion and ROA. On the other hand, a remarkable adverse connection between value proportion and ROE in Jordan.

Debt proportion implies that absolute liabilities are separated by all-out resources. In Jordan, the connection between ROA and obligation proportion was critical, and it denoted an adverse relationship, yet among ROE and obligation proportion was a big positive relationship (Khrawish et al., 2011).

Liquidity rate indicates how banks can fluently satisfy their current scores. It can be found by dividing trading investments by guests' deposits.

4.1.2 Research Methods

Here, we determine the liquidity, capital structure, productivity, balance sheet, revenue ratio and cost ratios and asset quality. We focus on the common financial ratios to evaluate the banks' financial performance. These ratios are chosen as follows:

K_1: This is the ratio between equity and total assets.

K_2: This is the ratio between loan ratio and total assets.

K_3: This is the ratio between liquid assets ratio and total assets.

K_4: This is the ratio between net profit and total assets.

K_5: This is the ratio between net interest income and total assets.

We use the TOPSIS and EDAS methods to analyze the financial performance of the considered banks in Jordan. Further details about these methods are explained as follows.

TOPSIS: Depending on the ideal solution (Yurdakul, 2003), different options should be compared based on given criteria. A decision making problem with m criteria can be represented by n points. The TOPSIS method's steps are listed below:

STEP 1: Induction a decision matrix

The decision matrix is divided into rows for alternatives and columns for criteria. The initial matrix A is created by the decision maker with size m*n and elements aij.

STEP 2: Establishing a standard decision matrix

Alternatives to the decision matrix are listed as follows: (a1... an), and Each standard is designed according to different alternatives. The standard decision matrix (R) can be created as follows:

$$r_{ij} = \frac{a_{ij}}{\sqrt{\sum_{k=1}^{m} a_{kj}^2}} \quad (1)$$

Where i= 1,2 …, n and j= 1,2 …, k.

ISSN: 2717-7386

DOI Number: http://dx.doi.org/10.46872/pj.533

STEP 3: Creating a standard weighted decision matrix

The weight values (wi) of the evaluation factor are specified. The sum of the calculated weight values must be one:

$$\sum_{i=1}^{n} w_i = 1 \quad (2)$$

The standard weighted decision matrix (V) is formed by multiplying the w_i of each element of the standard decision matrix's columns (R):

$$Vij = w_i \quad rij \quad (3)$$

STEP 4: Development of positive ideal (A $*$) and negative ideal (A-) solutions

Value weights are chosen based on whether they are maximized or minimized is desired:

$$A^* = \{v_1^*, v_2^*, \dots, v_n^*\} \quad (4)$$

$$A^- = \{v_1^-, v_2^-, \dots, v_n^-\} \quad (5)$$

STEP 5: Calculation of measurement separation

For each decision point assessment, the distance approach is used to calculate the possible deviations from the ideal solution. Deviation values are expressed as ideal separation (Si^*) and negative ideal separation (Si^-):

$$S_i^* = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_j^*\right)^2} \quad (6)$$

$$S_i^- = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_j^-\right)^2} \quad (7)$$

STEP 6: Set your relative affinity for the ideal solution

Estimates for each value are validated with the correct solution using ideal and negative identification steps. The negative ideal discrimination measure is compared to the overall discrimination measure in this test. The decision point indicates that the ideal solution is close to the ideal solution because the ideal solution is 1, while 0 indicates that the ideal solution is negative.

$$C_i^* = \frac{S_i^-}{S_i^- + S_i^*} \quad (8)$$

EDAS: The EDAS method is based on Positive distance from the average (PDA) and negative distance from the average (NDA). The evaluation of alternatives is based on a higher PDA score and a lower NDA score. The following is the stage of the EDAS method of a decision problem with m criteria and n alternatives:

STEP 1: Determine available alternatives, key criteria to explain the alternatives, and the decision-making framework.

STEP 2: The decision maker creates the initial matrix A with size m*n and elements aij.

ISSN: 2717-7386
DOI Number: http://dx.doi.org/10.46872/pj.533

STEP 3: Based on all criteria, the average solution is found as

$$AV = \left[AV_j\right]_{1\times m} \quad (9)$$

where

$$AV_j = \sum_{i=1}^{n} \frac{a_{ij}}{n} \quad (10)$$

STEP 4: Based on criteria type, the PDA and NDA matrixes are found as

$$PDA = \left[PDA_{ij}\right]_{n\times m} \quad (11)$$

$$NDA = \left[NDA_{ij}\right]_{n\times m} \quad (12)$$

For a favorable jth criterion, the ith alternative PDA and NDA for the jth criterion can be found as follows:

$$PDA_{ij} = \frac{max\left(0,(a_{ij}-AV_j)\right)}{AV_j} \quad (13)$$

$$NDA_{ij} = \frac{max\left(0,(AV_j-a_{ij})\right)}{AV_j} \quad (14)$$

For the unfavorable jth criterion, the ith choice PDA and NDA for the jth criterion can be found as follows:

$$PDA_{ij} = \frac{max\left(0,(AV_j-a_{ij})\right)}{AV_j} \quad (15)$$

$$NDA_{ij} = \frac{max\left(0,(a_{ij}-AV_j)\right)}{AV_j} \quad (16)$$

Where PDA_{ij} and NDA_{ij} represent the positive and negative distances of the ith choice from the mean solution for the jth criterion, respectively.

STEP 5: Find the weighted sum of PDA and NDA of all alternatives as

$$SPi = \sum_{j=1}^{m} w_j\, PDA_{ij} \quad (17)$$

$$SNi = \sum_{j=1}^{m} w_j\, NDA_{ij} \quad (18)$$

where w_j is the weight of jth criterion.

STEP 6: Normalize the SP and SN values for all alternatives as follows:

$$NSPi = \frac{SP_i}{(SP_i)} \quad (19)$$

$$NSNi = 1 - \frac{SN_i}{(SN_i)}$$

ISSN: 2717-7386

DOI Number: http://dx.doi.org/10.46872/pj.533

(20)

STEP 7: Calculate the rating score (AS) for all choices as follows:

$$AS_i = \frac{1}{2}(NSP_i + NSN_i)$$

(21)

where $0 \leq AS_i \leq 1$.

STEP 8: Sort the alternatives in descending order of AS. Of the candidate alternatives, the one with the highest AS is the best option.

4.2 Data and Variables

This study depends on the following sources: (i) The published annual reports of the Jordanian Islamic banks which are Jordan Islamic Bank (JIB), Islamic International Arab Bank (IIAB), SAFWA Islamic Bank (SAFWAIB). (ii) Annual reports of Amman Stock Exchange. (iii) The published reports of World Bank about Jordan. For simplicity in the symbolic representation of the considered banks, we used the following symbols:

B_1: This symbol represents JIB.

B_2: This symbol represents IIAB.

B_3: This symbol represents SAFWAIB.

4.3 Empirical Analysis

This section analyzes the financial performance of banks under consideration in Jordan. The following Table 1 shows the descriptive statics of the criteria.

Table 1: Descriptive Statics of the Criteria

Factor	**Mean**	**Std. Deviation**	**Min**	**Max**
Equity/ Total assets	,020	,005	,012	,026
Total loans/ Total assets	,630	,035	,570	,666
liquid assets / Total assets	,0106	,004	,005	,017
Net profit for the period / Total assets	,0123	,003	,008	,0166
Net interest income/ Total assets	,032	,0019	,0294	,034

The following Table 2 shows the criteria decision matrix for 2016.

Table 2: Criteria Decision Matrix for 2016

Banks/Criteria	K1	K2	K3	K4	K5
B1	,0206	,6124	,0185	,0042	,0147
B2	,0258	,5700	,0193	,0189	,0174
B3	,0175	,6095	,0247	,0062	,0090

The following Table 3 shows the weight values of ratios.

Table 3: Weight Values of Ratios

Rate	Weight
Equity / Total assets	,2
Total loans/ Total assets	,2
Liquid asset / Total asset	,2
Net profit for the period / Total assets	,2
Net interest income / Total asset	,2
Total	1

The following Table 4 and Table 5 show the weighted decision matrices when adopting

ISSN: 2717-7386

DOI Number: http://dx.doi.org/10.46872/pj.533

TOPSIS and EDAS, respectively.

Table 4: Weighted Decision Matrix (TOPSIS)

Ranks/Criteria	K1	K2	K3	K4	K5
B1	,0308	,0278	,0196	,0152	,0394
B2	,0386	,0258	,0204	,0686	,0466
B3	,0262	,0276	,0262	,0224	,0240

Table 5: Weighted Decision Matrix (EDAS)

Banks/Criteria	K1	K2	K3	K4	K5
B1	,0324	,029	,0166	,0138	,031
B2	,0364	,0236	,0218	,0676	,0446
B3	,0252	,0246	,0242	,023	,0234

The following Table 6 and Table 7 display minimum and maximum values when adopting TOPSIS and EDAS, respectively.

Table 6: Minimum and Maximum Values (TOPSIS)

A^*	A^-
,019	,009
,015	,013
,020	,008
,034	,0075
,023	,0071

Table 7: The SP and SN Values (EDAS)

SP	SN
,019	,009
,015	,012
,0201	,008
,0342	,0075
,023	,0071

The following Table 8 and Table 9 show the band performance score for the period 2016-2020 when adopting TOPSIS and EDAS, respectively.

Table 8: 2016-2020 Bank Performance Score (TOPSIS)

Banks	Si^*	Si^-	Score	Rank
B1	,132	,498	,790	1
B2	,590	,050	,078	2
B3	,600	,032	,050	3
B1	,391	,403	,507	1
B2	,576	,291	,335	2
B3	,724	,260	,264	3
B1	,859	,240	,218	3
B2	,763	,510	,400	2
B3	,020	1,092	,981	1
B1	,133	,030	,186	3
B2	,062	,117	,654	2
B3	,047	,142	,750	1
B1	,096	,033	,256	3
B2	,045	,090	,664	2
B3	,041	,103	,715	1

ISSN: 2717-7386
DOI Number: http://dx.doi.org/10.46872/pj.533

Table 9: 2016-2020 Bank Performance Score (EDAS)

Banks	NSP	NSN	AS	Rank
B1	,131	,498	,790	1
B2	,590	,050	,078	2
B3	,604	,031	,050	3
B1	,391	,403	,507	1
B2	,576	,291	,335	2
B3	,724	,260	,264	3
B1	,859	,240	,218	3
B2	,763	,510	,400	2
B3	,020	1,092	,981	1
B1	,133	,030	,185	3
B2	,062	,117	,654	2
B3	,047	,142	,750	1
B1	,096	,033	,255	3
B2	,044	,092	,663	2
B3	,041	,103	,714	1

As shown in Table 8 and Table 9, we found that the EDAS and TOPSIS performance scores of the banks under consideration fluctuated. The following Table 10 shows the evolution of TOPSIS and EDAS performance scores over time:

Table 10: Evolution of TOPSIS and EDAS Performance Scores Over Time

Year	Bank comparison
2016	B1>B2>B3
2017	B1>B2>B3
2018	B3>B2>B1
2019	B3>B2>B1
2020	B3>B2>B1

CONCLUSION

The performance of the banking system is essential for all services and manufacturing sectors of the economy. In order to enable the banks to work efficiently, their performance analysis evaluation should be investigated. In this paper, we propose an approach to analyze the performance of three Islamic banks for the 2016-2020 financial year by using the TOPSIS and EDAS methods.

The changes in financial performance have been compared on a yearly basis. We have discovered that there are fluctuations in the EDAS and TOPSIS performance scores of the considered Islamic banks in Jordan. The paper discovers that there are fluctuations in the EDAS and TOPSIS performance scores of analyzed Islamic banks in Jordan. This outcome demonstrates the performance instability of the Jordanian Islamic banks. This paper suggests the application of performance tests to augment competitiveness levels in today's intensely competitive environment.

Moreover, we recommend that the researchers conduct additional research on the Determinants of Jordan's Islamic Bank's financial performance by adding more banking elements and extending the sample period of the conducted research.

ISSN: 2717-7386

DOI Number: http://dx.doi.org/10.46872/pj.533

REFERENCES

Ajlouni, M. (2012). Islamic banks: Legitimacy, principles and applications. *Dar Al-Maseerah, Amman, Jordan, third Edition, the book in Arabic language*.

Balioti, V., Tzimopoulos, C., & Evangelides, C. (2018). Multi-criteria decision making using TOPSIS method under fuzzy environment. Application in spillway selection. *Multidisciplinary Digital Publishing Institute Proceedings*, 2(11), 637.

Borcherding, K., Schmeer, S., & Weber, M. (1995). Biases in multiattribute weight elicitation. *Contributions to decision making. Elsevier, Amsterdam*.

Chen, C. T. (2000). Extensions of the TOPSIS for group decision-making under fuzzy environment. *Fuzzy sets and systems*, 114(1), 1-9.

Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: some international evidence. *The World Bank Economic Review*, 13(2), 379 – 408.

Haron, S. (1996). Competition and other external determinants of the profitability of Islamic banks. *Islamic Economic Studies*, 4(1).

Keshavarz Ghorabaee, M., Zavadskas, E. K., Olfat, L., & Turskis, Z. (2015). Multi-criteria inventory classification using a new method of evaluation based on distance from average solution (EDAS). *Informatica*, 26(3), 435-451.

Khrawish, H. A., Siam, W. Z., & Khrawish, A. H. (2011). Determinants of Islamic bank profitability: Evidence from Jordan. *Middle Eastern Finance and Economics*, *13*, 43-57.

McGuire, J. B., Sundgren, A., & Schneeweis, T. (1988). Corporate social responsibility and firm financial performance. *Academy of management Journal*, 31(4), 854-872.

Ongore, V. O., & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya. *International journal of economics and financial issues*, 3(1), 237-252.

Pal, M. N., & Choudhury, K. (2009). Exploring the dimensionality of service quality: an application of topsis in the Indian banking industry. *Asia-Pacific Journal of Operational Research*, 26(01), 115-133.

Pinto, P., Hawaldar, I. T., Rahiman, H. U., TM, R., & Sarea, A. (2017). An evaluation of financial performance of commercial banks. *International Journal of Applied Business and Economic Research*, 15(22), 605-618.

Ramadan, I. Z., Kilani, Q. A., & Kaddumi, T. A. (2011). DETERMINANTS OF BANK PROFITABILITY: EVIDANCE FROM JORDAN. *International Journal of Academic Research*, *3*(4).

Samhan, H. M., & Al-Khatib, A. Y. (2015). Determinants of financial performance of Jordan Islamic bank. *Research Journal of Finance and Accounting*, 6(8), 37-47.

ÜNVAN, Y. A. (2020). Financial performance analysis of banks with TOPSIS and fuzzy TOPSIS approaches. *Gazi University Journal of Science*, 33(4), 904-923.

Waddock, S. A., & Graves, S. B. (1997). The corporate social performance–financial performance link. *Strategic management journal*, 18(4), 303-319.

Wu, M. L. (2006). Corporate social performance, corporate financial performance, and firm size: A meta-analysis. *Journal of American Academy of Business*, 8(1), 163-171.

Yurdakul, M., & Yusuf, İ. Ç. (2003). Türk Otomotiv Firmalarının Performans Ölçümü

ISSN: 2717-7386

DOI Number: http://dx.doi.org/10.46872/pj.533

ve Analizine Yönelik Topsıs Yöntemini Kullanan Bir Örnek Çalışma. Gazi Üniversitesi Mühendislik Mimarlık Fakültesi Dergisi, 18(1), 1-18.