# A Research on the Financial Performance of Islamic Banks: SD-WEDBA Method

(Research Article)

İslami Bankaların Finansal Performansları Üzerine Bir Araştırma: SD-WEDBA Yöntemi Doi: 10.29023/alanyaakademik.1622511

#### Esra AKSOY ERZURUMLU<sup>1</sup>, Mehmet GENÇTÜRK<sup>2</sup>,

<sup>1</sup> Dr. Öğr. Üyesi, Süleyman Demirel Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, Finans ve Bankacılık Bölümü, esraaksoy@sdu.edu.tr, Orcid No: 0000-0003-1395-2337

<sup>2</sup> Prof. Dr., Süleyman Demirel Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, İşletme Bölümü, mehmetgencturk@sdu.edu.tr, Orcid No: 0000-0002-2608-7664

#### ABSTRACT

Keywords: Islamic Banking, Ethnicity, Performance, WEDBA, Multi-Criteria Decision Making

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Changes in banking activities from past to present are based on economic, sociological and religious reasons. To include the Muslim population in this market, there are banks that offer Islamic banking services. The Islamic banking system has managed to attract attention, especially after the global financial crises, due to its financial performance. Islamic banking activities are concentrated in regions with a dense Muslim population. However, in recent years, it has also started to gain attention in areas with a smaller Muslim population. This study examines the performance of selected countries in the field of Islamic banking and its relationship with the Muslim population in the respective countries. In the study, the financial performances of selected countries in the field of Islamic banking were examined. The financial performance of Islamic banks operating in selected countries was evaluated with six criteria. The criteria are capital adequacy, non-performing loans, return on equity, return on assets, capital assets and liquid assets. Multi-Criteria Decision Making Method was used for analysis. SD and WEDBA methods were preferred among MCDM methods. The weights of the criteria were calculated by the SD method. Calculated criterion weights are included in the WEDBA method. The performances of the countries are listed. Considering the findings, Iraq, Sudan and Egypt were among the top performing countries. The relationship between the Islamic banking financial performance of the countries and the Muslim population density was found to be positive, in the same direction and moderately linear.

#### ÖZET

Geçmişten bugüne bankacılık faaliyetlerindeki değişiklikler, ekonomik, sosyolojik, dini gibi sebeplere dayanmaktadır. Finansal piyasalar içinde yer alan bankacılık sektörü toplumun ihtiyaçlarına en iyi şekilde hizmet etmek için çabalamaktadır. Müslüman kesimi de bu piyasa içine dahil edebilmek için İslami bankacılık hizmetleri sunan bankalar bulunmaktadır. İslami bankacılık sistemi özellikle yaşanan küresel krizlerin ardından gösterdiği finansal performansla dikkatleri üzerine çekmeyi başarmıştır. İslami bankacılık faaliyetleri Müslüman nüfusunun yoğun olduğu yerlerde yoğunlaşmaktadır. Ancak son dönemlerde Müslüman nüfusunun az olduğu yerlerde de ilgi çekmeye başlamıştır. Çalışmada seçili ülkelerin islami bankacılık alanındaki performansları ve bu performansların ilgili ülkedeki Müslüman nüfusu ile ilişkisi incelenmiştir. Çalışmada seçili ülkelerin İslami bankacılık alanındaki finansal performansları incelenmiştir. Seçili ülkelerde faaliyet gösteren İslami bankaların finansal performansları altı kriter çerçevesinde değerlendirilmiştir. Bu kriterler, sermave veterliliği, takipteki alacaklar, öz sermave karlılığı, aktif karlılığı, sermaye varlığı ve likit varlıklardır. Analiz için Çok Kriterli Karar Verme Yöntemi kullanılmıştır. ÇKKV yöntemlerinden SD ve WEDBA yöntemi tercih edilmiştir. Kriterlere SD yöntemi kullanılarak önem ağırlıkları atanmıştır. Hesaplanan kriter ağırlıkları WEDBA yöntemine atanarak ülkelerin performansları sıralanmıştır. Elde edilen bulgulara bakıldığında en iyi performans gösteren ülkeler başında Irak, Sudan ve Mısır gelmiştir. Ülkelerin islami bankacılık finansal performansı ile Müslüman nüfus yoğunluğu arasında pozitif ve aynı yönlü orta derecede doğrusal bir ilişki tespit edilmiştir.

## **1. INTRODUCTION**

Banking services that started in Europe in the 13th century continue to operate in many parts of the world (Çanakçı & Tunalı, 2018). Muslims stayed away from banks because interest-bearing transactions were used in banking activities. In the 1960s, the first interest-free banking activity was seen in Egypt. The first Islamic investment institution was established in Malaysia ("TKBB, Katılım Bankacılığı Strateji", www.tbb.org.tr). One of the main reasons for the emergence of Islamic banking activities is the participation of Muslim savings in the economy. The basic principle of Islamic banking is to stay away from interest transactions, which are considered haram. It is aimed that the savings collected and used under the name of Islamic banking can be processed according to Islamic sensitivity.

From past to present, changes in banking activities are based on economic, sociological and religious reasons. The banking sector, which is included in the financial markets, strives to serve the needs of the society in the best way. Banks are trying to show the best performance in the economic system by using their resources at the optimum level. There are banks that offer Islamic banking services in order to include the Muslim segment in this market.

The Islamic banking system has managed to attract attention with its financial performance, especially after the global crises. The Islamic banking system displayed a robust outlook in terms of sustainable growth and less vulnerability compared to traditional banks (Çanakçı & Tunalı, 2018).

Growth in the Islamic financial services sector is most noticeable in Muslim markets. According to a study conducted by the Pew Research Center, it was determined that there were 1.8 billion Muslims worldwide in 2015. This number corresponds to approximately 24% of the global population. Islam is also seen as the fastest growing major religion. It is stated that if current demographic trends continue, the number of Muslims, approximately 62%, live in the Asia-Pacific region. Indonesia, India, Pakistan, Bangladesh, Iran and Türkiye are prominent countries in this region. It has been stated that the Muslim population in Europe has also increased. It is predicted that by 2050, 10% of the population of all Europeans will be Muslim (Lipka, 2017). It is predicted that the interest in the Islamic banking sector will progress in parallel with the increasing Muslim population density. However, with the latest developments in the Islamic banking sector, it is shown that the customers of Islamic banks are not only Muslims but also non-Muslim customers. This situation shows that only religious sensitivity is not the reason for preference in Islamic banking (Toraman et al, 2015).

Although the sensitivity of Islamic banking is high due to the principles of lending, it is spreading rapidly among non-Muslims around the world. The products and services included in Islamic banking activities are gaining popularity among non-Muslims globally for their wider product content and ability to overcome the global economic collapse (Abdullah et al, 2012). There are efforts of the sector to transcend religious beliefs in order to gain more market share in financial markets. Basically, since sharia finance is a blend of Islamic banking sector previously catered to Muslims who wanted to avoid traditional interest-only banking. The sector was a small segment market in the market. Recently, the Islamic finance sector has managed to attract a wider client base due to cash-rich Muslim investors and increased ethical demand. Non-Muslim investors have also been looking for less risky alternatives since the global credit crises. This situation has increased the tendency towards Islamic banking sectors (Abdullah et al, 2012).

On a global scale, expectations for a strong recovery in the global economy remained uncertain in 2023. The ongoing war between Russia and Ukraine, regional geopolitical tensions, the adverse effects of climate change, and a series of similar factors heightened uncertainty in economic markets. While the effects of the pandemic persisted, global inflation began to rise. In particular, inflation prompted the central banks of developed countries to embark on the most aggressive cycle of interest rate hikes seen in decades ("TKBB, Katılım Bankaları 2023", www.tbb.org.tr).

According to the 2023 activity report of the Participation Banks Association of Türkiye, Islamic finance has followed a comprehensive roadmap over the past decade. This roadmap has included systematic and ecosystem-supporting regulatory frameworks, enabling the sector to gain momentum and deepen its effectiveness. During this process, countries such as Indonesia, Malaysia, Saudi Arabia, and Türkiye have given significant importance to Islamic finance principles as part of their national economic strategies. Consequently, the growth rates of Islamic financial assets have reached notable levels. All sectors demonstrated strong performance in 2023. The sukuk market, for instance, exhibited significant activity in 2022, particularly due to increased issuances in Malaysia. On the other hand, rising oil prices negatively impacted sukuk issuance activities in Gulf countries. Beyond Malaysia, corporate issuances were conducted in countries like Tanzania and Nigeria during this period. Takaful, one of the key sectors of the Islamic finance system, recorded a 16% growth in 2022. However, year-end results revealed that nearly half of takaful firms experienced declines compared to the previous period, due to factors such as rising claims payments in vehicle takaful and investment losses. The total assets of other Islamic financial institutions

reached \$167 billion in 2022. Saudi Arabia continued to be the country hosting the largest number of institutions in this field. The development of Islamic banking over the past decade has been significantly influenced by advancements in fintech, digital banking, and artificial intelligence. During this period, several new digital participation banks were established in countries such as Malaysia, Indonesia, Bahrain, Saudi Arabia, Türkiye, and the United Kingdom. Furthermore, Türkiye, Malaysia, Saudi Arabia, Indonesia, and Kuwait were among the top five countries with the highest sukuk issuances in 2023 ("TKBB, Katılım Bankaları 2023", www.tbb.org.tr).

The purpose of this study is to investigate the financial performance of Islamic banking activities, mostly operating in the Asia Pacific region, in terms of ethnicity. Our research question is whether the financial performance of Islamic banks is higher in countries with a sizeable Muslim population. Is there a relationship between the Muslim population density of countries and the financial performance of Islamic banks? In the analysis, six criteria were used to determine the Islamic banking financial performance of the countries. The criteria weights were determined by the SD method. The financial performances of the countries are listed by using the calculated criterion weights in the WEDBA method. Then, the relationship between the financial performance ranking of the countries and the Muslim population density ranking was investigated.

### 2. THEORETICAL FRAMEWORK

The financial crisis experienced in 2008 led especially the supporters of Islamic Banking to renew the claim that Islamic Banking is superior to traditional banking. Islamic Banking is known in the West as a lesser known banking system. However, considering the rapidly increasing Muslim population in many parts of Europe, this potential cannot be underestimated. Measurement of acceptance among non-Muslims is of great importance for the Islamic Banking system that can operate worldwide. Loo (2010) explored the attitudes and perceptions of both Muslims and non-Muslims towards Islamic banking. The study highlighted that while approximately 60% of Malaysia's population consists of Muslims, the majority of the country's wealth is concentrated in the hands of non-Muslims. The findings revealed that Muslims generally support Islamic banking, whereas non-Muslims tend to associate Islamic banking predominantly with Muslims. Furthermore, generational differences among non-Muslims were found to influence their perceptions of Islamic banking. Abdullah et al. (2012) investigated the perspectives of non-Muslim customers regarding Islamic banking products and services in Malaysia. The study, which surveyed 152 participants from Kuala Lumpur, showed notable progress in the adoption of Islamic banking among non-Muslims in the city. Despite these advancements, the researchers emphasized the need for increased efforts to improve non-Muslim customers' understanding of Islamic banking concepts. Haron et al. (1994) compared the preferences of Muslim and non-Muslim customers of commercial banks in Malaysia and found no significant differences in the factors they considered important. Both groups ranked fast and efficient service, transaction speed, and friendly bank staff as their top three priorities. Kader et al. (2014) examined customer preferences in Malaysia's competitive Islamic banking market, focusing on factors influencing bank selection. Their study utilized primary data collected from customers of Bank Rakyat, a leading Islamic bank. The findings showed that customers preferred Bank Rakyat due to its service quality, financial returns, and physical appearance. Additionally, the results suggested that Muslim and non-Muslim customers were equally influenced by these factors. The study indicated that when the market offers a wide range of Sharia-compliant banks, customers feel assured of the religious aspect and instead prioritize other criteria when selecting a bank. Lastly, Bley and Kuehn (2004) analyzed the relationship between university students' knowledge of financial concepts and terms in both conventional and Islamic banking, emphasizing the influence of religion on their understanding. The universe of the study was determined as students who graduated and undergraduate business students from a university in the United Arab Emirates. Necessary data on financial information, religious approaches and languages were obtained from the students. With the information obtained, the roles on attitudes and preferences towards financial services were investigated. The results showed that the knowledge of traditional banking terms and concepts is higher than that of Islamic banking. It has been observed that the influence of the Arabic language as the primary determinant in Islamic banking knowledge is high. In parallel with this information, when the education is completed, it has been observed that there is an increase in the tendency to master the knowledge of traditional and Islamic finance. It has been observed that students studying in the field of finance have more general knowledge about both financial systems. At the same time, religious sincerity rather than knowledge has shown to be the strongest indicator of preference for Islamic banking services. Pratiwi & Affandy (2020) conducted research in Papua Province, Indonesia. Papua province is one of the regions with a low Muslim population. The knowledge and perceptions of Muslims and non-Muslims about the products and services offered by Islamic banking activities in the region were investigated. Data were collected from Muslim and non-Muslim participants for the study. Looking at the findings obtained from the analyzes, a relationship was determined between religion and knowledge, religion and understanding of Islamic banking products, services and operational activities. The results demonstrated that both Muslims and non-Muslims had a positive and favorable perception of Islamic banking. Safdar et al. (2024) investigated the differences between Islamic and conventional banks in Pakistan in terms of operational efficiency, liquidity risk, and asset quality. The findings indicate that fully-fledged Islamic banks are operationally less efficient and experience higher liquidity risk compared to conventional banks. However, it has been determined that Islamic banks have better asset quality than their conventional counterparts. Amuda & Al-Nasser (2024) identified three major challenges that Islamic banks face in competing with conventional banking activities in non-Muslim countries. These challenges include regulatory, operational, and institutional difficulties. Shufaa & Mehboob (2024) examined the financial performance of Islamic and conventional banks in Tanzania. Their findings suggest that conventional banks perform better than Islamic banks in Tanzania. The primary reason for this is that Islamic banking is a relatively new phenomenon in Tanzania, and since Tanzania is not an Islamic country, certain policies and regulations are not fully aligned with Islamic banking practices. Suandi et al. (2025) analyzed the impact of corporate social responsibility (CSR) implementation and marketing on the performance of Islamic banks, particularly in communities governed by religious commitment. The study found that CSR marketing plays a significant role in enhancing the branch performance of Islamic banks in a religious society. Farooq et al. (2025) investigated the relationship between the financial performance of Islamic and conventional banks in Malaysia and corporate governance characteristics. Their study focused on the impact of female board participation and other board governance mechanisms on bank performance. One of the findings of the research is that the governance structure of commercial bank boards tends to be more passive compared to Islamic banks.

## 3. MATERIAL AND METHODS

The aim of this study is to evaluate the financial performance of Islamic banks in selected countries based on predetermined criteria. The data used in the analysis were obtained from the Islamic Financial Services Board (IFSB) website. The IFSB website provides Islamic banking data for 26 countries. However, simultaneous data for the predetermined criteria were only available for 19 countries. The criteria determined for analyzing the Islamic banking financial performance of countries include capital adequacy, non-performing loans, return on assets (ROA), return on equity (ROE), capital asset ratio, and liquid assets. These data represent the latest period figures for the countries, specifically the end of 2021. The simultaneous data of the countries is limited to 2021.

For the analysis, criterion weights were determined initially. The criterion weights were calculated using the SD method. By incorporating the criterion weights, the financial performance of Islamic banks in countries was evaluated using the WEDBA method. Subsequently, the magnitude of the relationship between the proportion of Muslim population in each country and the financial performance of their Islamic banks was examined.

#### 3.1. Method

Multiple Criteria Decision Making (MCDM) methods were employed in the study. The major characteristic of MCDM methods is their ability to evaluate multiple criteria and alternatives simultaneously. Additionally, these methods determine the importance weights of the included criteria, thus identifying the most significant criterion/criteria. This contributes to obtaining crucial information that can influence the outcome of the analysis. MCDM methods not only help determine the best alternative among alternatives but also provide the opportunity for ranking. There are numerous MCDM methods widely used in the literature. Some of the methods used for criterion weighting include Entropy, MEREC, CRITIC, and SD. As for the methods used for ranking alternatives and identifying the best alternative, notable ones include TOPSIS, SAW, MULTIMOORA, MOOSRA, COPRAS, PROMETHEE, and ELECTRE. These methods can vary depending on the data used for the analysis. For instance, the Entropy method requires all matrix values to be greater than zero. SD and WEDBA methods were used in this study. The reason why these methods are preferred is that they are suitable for the data used in the analysis. According to the literature survey conducted at the same time, the use of the WEDBA method is very low. For this reason, it is used to show the applicability of the method. The use of WEDBA method with this study will contribute to the literature.

#### SD Method

The SD (Standard Deviation) method is applied to determine the importance weights of the criteria. In the SD method, criterion importance weights are calculated without expert opinion. The SD Method is entirely based on objective weighting. The SD method was introduced to the literature by Diakoulaki et al, (1995). The method is used to determine how much the series deviate from their mean (Akbulut & Şenol, 2021). The steps of the SD method are presented below (Jahan et al., 2012; Akbulut & Şenol, 2021).

The first step of SD is the creation of the decision matrix. A decision matrix is created with the obtained data. Then the normalization process is performed. Equation (1) and/or Equation (2) are used to normalize the decision matrix (Jahan et al., 2012).

Equation (1) is used for benefit criteria, while Equation (2) is used for cost criteria.

$$r_{ij} = \frac{x_{ij} - x_j^{min}}{\sum_{j}^{max_j^{min}}}$$
(1)

$$r_{ij} = \frac{x_j^{max_{ij}}}{x_j^{max_j^{min}}}$$
(2)

After the normalization process,  $\sigma_j$  (standard deviation) values for each criterion are calculated. Equation (3) is used for the calculation process.

$$\boldsymbol{\sigma}_{j} = \sqrt{\frac{\sum_{i=1}^{k} (y_{ij} - \overline{y}_{j})^{2}}{k}}$$
(3)

The value  $\overline{y}$  in Equation (3) represents the average value of the j-th criterion. Then, Equation (4) is used to calculate the importance weights of each criterion.

$$\boldsymbol{w}_{j} = \frac{\sigma_{j}}{\sum_{j=1}^{n} \sigma_{j}} \qquad \qquad J=1,2,\dots m$$
(4)

#### WEDBA Method

The Weighted Euclidean Distance Based Approach (WEDBA) operates by evaluating the weighted distances of alternatives from the best and worst conditions. In this method, the ideal point represents the most favorable condition, while the anti-ideal point signifies the least favorable condition (Demir, 2021). The steps involved in implementing the WEDBA method are as follows (Jain & Ajmera, 2019; Demir, 2021).

As the first step of the method, a decision matrix is created. After obtaining the decision matrix, the normalized values of the decision matrix are calculated. Equation (5) is used for benefit criteria, while equation (6) is used for cost criteria.

$$p_{ij} = \frac{x_{ij}}{\max(x_{ij})} \tag{5}$$

$$\boldsymbol{p}_{ij} = \frac{\min(\boldsymbol{x}_{ij})}{\boldsymbol{x}_{ij}} \tag{6}$$

A standardized decision matrix is created. The normalized decision matrix is expressed as the standardized decision matrix using Equation (7).

$$y_{ij} = \frac{p_{ij} - \mu_j}{\sigma_j} \tag{7}$$

In Equation (7),  $\mu_j$  represents the mean value and  $\sigma_j$  represents the standard deviation. The values of  $\mu_j$  and  $\sigma_j$  are calculated using Equation (8) and Equation (9) respectively.

$$\mu_j = \frac{\sum_{i=1}^m p_{ij}}{m} \tag{8}$$

$$\sigma_j = \sqrt{\frac{\sum_{i=1}^m (p_{ij} - \mu_j)^2}{m}} \tag{9}$$

For the next step, the ideal  $y_{ij}^+$  and anti-ideal  $y_{ij}^-$  values are calculated. The ideal values are calculated using Equation (10), and the anti-ideal values are calculated using Equation (11).

$$y_{ij}^+ = max(y_{ij}) \tag{10}$$

$$y_{ij}^- = min(y_{ij}) \tag{11}$$

The weighted Euclidean distances are calculated. For each alternative, the weighted  $WED_i^+$  is calculated using Equation (12), and  $WED_i^-$  is calculated using Equation (13).

$$WED_{i}^{+} = \sqrt{\sum_{j=1}^{n} \{ w_{j} (y_{ij} - y_{ij}^{+})^{2} \}}$$
(12)

$$WED_{i}^{-} = \sqrt{\sum_{j=1}^{n} \{ w_{j} (y_{ij} - y_{ij}^{-})^{2} \}}$$
(13)

In the final step, Equation (14) is used to calculate the Index score IS, which will be used to rank the alternatives. The obtained scores are ranked from highest to lowest. The alternative with the highest Index score is identified as the best alternative.

$$IS_i = \frac{WED_i^-}{WED_i^+ + WED_i^+} \tag{14}$$

## 4. APPLICATION

In this stage, the weights of the criteria have been calculated using the SD method. The solution steps of the SD method are shown below. A decision matrix has been created for the analysis. The decision matrix is presented in Table 1.

| Table 1. Decision Matrix |                     |                             |      |      |                   |                  |
|--------------------------|---------------------|-----------------------------|------|------|-------------------|------------------|
| 2021                     | Capital<br>adequacy | Non-<br>performing<br>loans | ROA  | ROE  | Capital<br>assets | Liquid<br>assets |
| Saudi Arabia             | 19.4                | 1                           | 2.4  | 19.4 | 12.7              | 26.8             |
| Malaysia                 | 18.8                | 1.3                         | 1.1  | 15.3 | 6.9               | 20.3             |
| Kuwait                   | 18.6                | 1.5                         | 1.6  | 17   | 11.1              | 26.8             |
| United Arab Emirates     | 18.1                | 7.1                         | 1.4  | 10.2 | 12.8              | 15.3             |
| Qatar                    | 19.1                | 1.8                         | 1.5  | 16.2 | 12.8              | 20.8             |
| Bahrain                  | 17.9                | 6.4                         | 0.9  | 10.8 | 8.3               | 18.6             |
| Türkiye                  | 18.8                | 2.9                         | 1.4  | 20.2 | 6                 | 62.2             |
| Bangladesh               | 12.8                | 3.9                         | 0.4  | 20.4 | 4.9               | 14.5             |
| Indonesia                | 25.7                | 2.6                         | 1.7  | 13.6 | 10.8              | 10.1             |
| Brunei Darussalam        | 17.9                | 4.1                         | 1.4  | 10.6 | 10.9              | 43.7             |
| Egypt                    | 21.98               | 3.68                        | 2.73 | 34   | 8.03              | 69.31            |
| Iraq                     | 149.8               | 32.2                        | 0.5  | 0.9  | 53.3              | 54.5             |
| Jordan                   | 21.5                | 1.9                         | 1.7  | 18.3 | 8.2               | 38.2             |
| Nigeria                  | 18.1                | 5.2                         | 2.2  | 31.1 | 7.6               | 26.3             |
| Oman                     | 16.9                | 2.35                        | 0.9  | 6    | 13.6              | 10.2             |
| United Kingdom           | 18.3                | 1.5                         | 0.1  | 1.2  | 9.5               | 6.8              |
| Palestine                | 15.7                | 3.3                         | 1    | 13   | 7.7               | 32.3             |
| Sudan                    | 7.1                 | 3.4                         | 4.9  | 80.7 | 1.8               | 62               |
| Pakistan                 | 16                  | 3.6                         | 2.2  | 39.3 | 5                 | 31.8             |

The normalization process has been carried out using the data in the decision matrix. The benefit criteria, including capital adequacy, return on equity, return on assets, capital assets, and liquidity assets, have been calculated using Equation (1). Equation (2) has been used for the cost criterion, which is represented by non-performing loans. The normalized decision matrix is presented in Table 2.

| 2021                 | Capital<br>adequacy | Non-<br>performing<br>loans | ROA     | ROE     | Capital assets | Liquid assets |
|----------------------|---------------------|-----------------------------|---------|---------|----------------|---------------|
| Saudi Arabia         | 0.08619             | 1.00000                     | 0.47917 | 0.23183 | 0.21165        | 0.31995       |
| Malaysia             | 0.08199             | 0.99038                     | 0.20833 | 0.18045 | 0.09903        | 0.21597       |
| Kuwait               | 0.08059             | 0.98397                     | 0.31250 | 0.20175 | 0.18058        | 0.31995       |
| United Arab Emirates | 0.07708             | 0.80449                     | 0.27083 | 0.11654 | 0.21359        | 0.13598       |
| Qatar                | 0.08409             | 0.97436                     | 0.29167 | 0.19173 | 0.21359        | 0.22396       |
| Bahrain              | 0.07568             | 0.82692                     | 0.16667 | 0.12406 | 0.12621        | 0.18877       |

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| Türkiye           | 0.08199 | 0.93910 | 0.27083 | 0.24185 | 0.08155 | 0.88626 |
|-------------------|---------|---------|---------|---------|---------|---------|
| Bangladesh        | 0.03994 | 0.90705 | 0.06250 | 0.24436 | 0.06019 | 0.12318 |
| Indonesia         | 0.13034 | 0.94872 | 0.33333 | 0.15915 | 0.17476 | 0.05279 |
| Brunei Darussalam | 0.07568 | 0.90064 | 0.27083 | 0.12155 | 0.17670 | 0.59031 |
| Egypt             | 0.10427 | 0.91410 | 0.54792 | 0.41479 | 0.12097 | 1.00000 |
| Iraq              | 1.00000 | 0.00000 | 0.08333 | 0.00000 | 1.00000 | 0.76308 |
| Jordan            | 0.10091 | 0.97115 | 0.33333 | 0.21805 | 0.12427 | 0.50232 |
| Nigeria           | 0.07708 | 0.86538 | 0.43750 | 0.37845 | 0.11262 | 0.31195 |
| Oman              | 0.06868 | 0.95673 | 0.16667 | 0.06391 | 0.22913 | 0.05439 |
| United Kingdom    | 0.07849 | 0.98397 | 0.00000 | 0.00376 | 0.14951 | 0.00000 |
| Palestine         | 0.06027 | 0.92628 | 0.18750 | 0.15163 | 0.11456 | 0.40793 |
| Sudan             | 0.00000 | 0.92308 | 1.00000 | 1.00000 | 0.00000 | 0.88306 |
| Pakistan          | 0.06237 | 0.91667 | 0.43750 | 0.48120 | 0.06214 | 0.39994 |
|                   |         |         |         |         |         |         |

After obtaining the normalized decision matrix, the standard deviation values  $Q_i$  for each criterion were calculated. Equation (3) was used to calculate the  $Q_i$  values. The calculated  $Q_i$  values are shown in Table 3.

|         | Table 3. Qj Values for Each Criterion |                             |         |         |                |               |
|---------|---------------------------------------|-----------------------------|---------|---------|----------------|---------------|
|         | Capital<br>adequacy                   | Non-<br>performing<br>loans | ROA     | ROE     | Capital assets | Liquid assets |
| $Q_{i}$ | 0.21360                               | 0.21989                     | 0.22048 | 0.22296 | 0.20739        | 0.30570       |

The importance weights for each criterion were calculated using the obtained  $Q_i$  values. Equation (4) was used to calculate the importance weights of the criteria. The derived importance weights for the criteria are presented in Table 4.

| _          | Table 4. Importance Weight Values For Each Criterion |                             |         |         |                |               |
|------------|--|-----------------------------|---------|---------|----------------|---------------|
|            | Capital<br>adequacy                                  | Non-<br>performing<br>loans | ROA     | ROE     | Capital assets | Liquid assets |
| $W_{ m j}$ | 0.15367  | 0.15819                     | 0.15861 | 0.16040 | 0.14920        | 0.21993       |

As seen in Table 4, the criterion with the highest importance weight is "Liquidity Assets" with an index value of 0.21993. As shown in Figure 1, liquidity assets have a higher importance weight compared to other criteria. Due to its higher importance weight compared to other criteria, it is believed that this criterion will have an impact on the ranking of countries' performance evaluations.



Figure 1. Graphical Representation of Criterion Importance Weights

After calculating the importance weights of the criteria, these values were assigned to the WEDBA method. The implementation steps of the WEDBA method are given below.

## Performance evaluation with the WEDBA method

The WEDBA method was initiated with the decision matrix presented in Table 1. The benefit criteria, including capital adequacy, return on equity, return on assets, capital assets, and liquidity assets, were calculated using Equation (5). For the criterion of non-performing loans, considered as a cost criterion, Equation (6) was used. The normalized decision matrix is shown in Table 5.

| 2021                 | Capital<br>adequacy | Non-<br>performing<br>loans | ROA     | ROE     | Capital assets | Liquid assets |
|----------------------|---------------------|-----------------------------|---------|---------|----------------|---------------|
| Saudi Arabia         | 0.12951             | 1.00000                     | 0.01602 | 0.12951 | 0.08478        | 0.17891       |
| Malaysia             | 0.12550             | 0.76923                     | 0.00734 | 0.10214 | 0.04606        | 0.13551       |
| Kuwait               | 0.12417             | 0.66667                     | 0.01068 | 0.11348 | 0.07410        | 0.17891       |
| United Arab Emirates | 0.12083             | 0.14085                     | 0.00935 | 0.06809 | 0.08545        | 0.10214       |
| Qatar                | 0.12750             | 0.55556                     | 0.01001 | 0.10814 | 0.08545        | 0.13885       |
| Bahrain              | 0.11949             | 0.15625                     | 0.00601 | 0.07210 | 0.05541        | 0.12417       |
| Türkiye              | 0.12550             | 0.34483                     | 0.00935 | 0.13485 | 0.04005        | 0.41522       |
| Bangladesh           | 0.08545             | 0.25641                     | 0.00267 | 0.13618 | 0.03271        | 0.09680       |
| Indonesia            | 0.17156             | 0.38462                     | 0.01135 | 0.09079 | 0.07210        | 0.06742       |
| Brunei Darussalam    | 0.11949             | 0.24390                     | 0.00935 | 0.07076 | 0.07276        | 0.29172       |
| Egypt                | 0.14673             | 0.27174                     | 0.01822 | 0.22697 | 0.05360        | 0.46268       |
| Iraq                 | 1.00000             | 0.03106                     | 0.00334 | 0.00601 | 0.35581        | 0.36382       |
| Jordan               | 0.14352             | 0.52632                     | 0.01135 | 0.12216 | 0.05474        | 0.25501       |
| Nigeria              | 0.12083             | 0.19231                     | 0.01469 | 0.20761 | 0.05073        | 0.17557       |
| Oman                 | 0.11282             | 0.42553                     | 0.00601 | 0.04005 | 0.09079        | 0.06809       |
| United Kingdom       | 0.12216             | 0.66667                     | 0.00067 | 0.00801 | 0.06342        | 0.04539       |
| Palestine            | 0.10481             | 0.30303                     | 0.00668 | 0.08678 | 0.05140        | 0.21562       |
| Sudan                | 0.04740             | 0.29412                     | 0.03271 | 0.53872 | 0.01202        | 0.41389       |
| Pakistan             | 0.10681             | 0.27778                     | 0.01469 | 0.26235 | 0.03338        | 0.21228       |

# Table 5. Normalized Decision Matrix (WEDBA Method)

The standardized decision matrix was obtained using the values of the normalized decision matrix. Equation (7) was used to obtain the standardized decision matrix.

| Table 6. Standardized Decision Matrix (WEDBA Method) |                     |                             |         |         |                |               |
|--|---------------------|-----------------------------|---------|---------|----------------|---------------|
| 2021   | Capital<br>adequacy | Non-<br>performing<br>loans | ROA     | ROE     | Capital assets | Liquid assets |
| Saudi Arabia   | 0.12951             | 1.00000                     | 0.01602 | 0.12951 | 0.08478        | 0.17891       |
| Malaysia   | 0.12550             | 0.76923                     | 0.00734 | 0.10214 | 0.04606        | 0.13551       |
| Kuwait   | 0.12417             | 0.66667                     | 0.01068 | 0.11348 | 0.07410        | 0.17891       |
| United Arab Emirates                                 | 0.12083             | 0.14085                     | 0.00935 | 0.06809 | 0.08545        | 0.10214       |
| Qatar  | 0.12750             | 0.55556                     | 0.01001 | 0.10814 | 0.08545        | 0.13885       |
| Bahrain  | 0.11949             | 0.15625                     | 0.00601 | 0.07210 | 0.05541        | 0.12417       |
| Türkiye  | 0.12550             | 0.34483                     | 0.00935 | 0.13485 | 0.04005        | 0.41522       |
| Bangladesh   | 0.08545             | 0.25641                     | 0.00267 | 0.13618 | 0.03271        | 0.09680       |
| Indonesia  | 0.17156             | 0.38462                     | 0.01135 | 0.09079 | 0.07210        | 0.06742       |
| Brunei Darussalam                                    | 0.11949             | 0.24390                     | 0.00935 | 0.07076 | 0.07276        | 0.29172       |
| Egypt  | 0.14673             | 0.27174                     | 0.01822 | 0.22697 | 0.05360        | 0.46268       |

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| Iraq           | 1.00000 | 0.03106 | 0.00334 | 0.00601 | 0.35581 | 0.36382 |
|----------------|---------|---------|---------|---------|---------|---------|
| Jordan         | 0.14352 | 0.52632 | 0.01135 | 0.12216 | 0.05474 | 0.25501 |
| Nigeria        | 0.12083 | 0.19231 | 0.01469 | 0.20761 | 0.05073 | 0.17557 |
| Oman           | 0.11282 | 0.42553 | 0.00601 | 0.04005 | 0.09079 | 0.06809 |
| United Kingdom | 0.12216 | 0.66667 | 0.00067 | 0.00801 | 0.06342 | 0.04539 |
| Palestine      | 0.10481 | 0.30303 | 0.00668 | 0.08678 | 0.05140 | 0.21562 |
| Sudan          | 0.04740 | 0.29412 | 0.03271 | 0.53872 | 0.01202 | 0.41389 |
| Pakistan       | 0.10681 | 0.27778 | 0.01469 | 0.26235 | 0.03338 | 0.21228 |

The ideal and anti-ideal values were calculated using the values from the standardized decision matrix. Equation (10) was used to calculate the ideal values, while Equation (11) was used to calculate the anti-ideal values. The resulting values are shown in Table 7.

|                       | Table 7. Ideal And Anti-Ideal Value Information |                         |          |          |                |               |  |
|-----------------------|---|-------------------------|----------|----------|----------------|---------------|--|
|                       | Capital<br>adequacy                             | Non-performing<br>loans | ROA      | ROE      | Capital assets | Liquid assets |  |
| $\mathbf{Y_{ij}}^{+}$ | 4.09868   | -1.48276                | 3.13663  | 3.41689  | 3.94603        | 2.00059       |  |
| Y <sub>ij</sub>       | -0.58290  | 2.46381                 | -1.39898 | -1.06817 | -0.87582       | -1.27054      |  |

For the calculation of weighted Euclidean distances, Equation (12) was used for  $WED_{i^+}$  and Equation (13) was used for  $WED_{i^-}$ . Then, the Index score  $IS_i$  value was calculated using Equation (14). The obtained Index scores were used to rank the countries, and the rankings are shown in Table 8.

| 2021                 | WEDi <sup>+</sup> | WEDi <sup>-</sup> | IS      | Ranking of<br>Alternatives |
|----------------------|-------------------|-------------------|---------|----------------------------|
| Saudi Arabia         | 3.36297           | 1.15927           | 0.25635 | 14                         |
| Malaysia             | 3.56974           | 0.74355           | 0.17239 | 18                         |
| Kuwait               | 3.30499           | 1.05711           | 0.24234 | 16                         |
| United Arab Emirates | 3.32501           | 1.56272           | 0.31972 | 8                          |
| Qatar                | 3.29468           | 1.10213           | 0.25067 | 15                         |
| Bahrain              | 3.44346           | 1.47208           | 0.29947 | 9                          |
| Türkiye              | 3.10528           | 1.85706           | 0.37423 | 4                          |
| Bangladesh           | 3.58062           | 1.30772           | 0.26752 | 13                         |
| Indonesia            | 3.32875           | 1.26800           | 0.27585 | 12                         |
| Brunei Darussalam    | 3.15712           | 1.65376           | 0.34375 | 7                          |
| Egypt                | 2.70306           | 2.31673           | 0.46152 | 3                          |
| Iraq                 | 2.46992           | 3.27012           | 0.56970 | 1                          |
| Jordan               | 3.16742           | 1.33659           | 0.29675 | 10                         |
| Nigeria              | 3.01024           | 1.75833           | 0.36873 | 6                          |
| Oman                 | 3.54804           | 1.08390           | 0.23401 | 17                         |
| United Kingdom       | 3.90488           | 0.62445           | 0.13787 | 19                         |
| Palestine            | 3.34504           | 1.38314           | 0.29253 | 11                         |
| Sudan                | 2.65531           | 3.10359           | 0.53892 | 2                          |
| Pakistan             | 2.98666           | 1.77298           | 0.37250 | 5                          |

Table 8. Financial Performances Of Countries In İslamic Banking For The Year 2021

As seen, Iraq has emerged as the top-performing country, followed by Sudan and Egypt. The country with the lowest ranking in terms of the financial performance of its Islamic banks among the 19 countries is the UK. After the ranking of countries' Islamic banks' financial performances, their relationship with the Muslim population ratio was investigated. Table 9 provides the Muslim population ratios of the selected 19 countries. The ratios of the

| Table 9. Muslim Population Ratios of Countries |                            |  |  |  |  |
|--|----------------------------|--|--|--|--|
| Countries                                      | Muslim population ratios % |  |  |  |  |
| Saudi Arabia                                   | 93                         |  |  |  |  |
| Malaysia                                       | 63.7                       |  |  |  |  |
| Kuwait   | 74.1                       |  |  |  |  |
| <b>United Arab Emirates</b>                    | 76.9                       |  |  |  |  |
| Qatar  | 67.7                       |  |  |  |  |
| Bahrain  | 70.3                       |  |  |  |  |
| Türkiye  | 98                         |  |  |  |  |
| Bangladesh                                     | 89.8                       |  |  |  |  |
| Indonesia                                      | 87.2                       |  |  |  |  |
| Brunei Darussalam                              | 75.1                       |  |  |  |  |
| Egypt  | 94.9                       |  |  |  |  |
| Iraq   | 99                         |  |  |  |  |
| Jordan   | 97.2                       |  |  |  |  |
| Nigeria  | 48.8                       |  |  |  |  |
| Oman   | 85.9                       |  |  |  |  |
| United Kingdom                                 | 4.4                        |  |  |  |  |
| Palestine                                      | 97.6                       |  |  |  |  |
| Sudan  | 90.7                       |  |  |  |  |
| Pakistan                                       | 96.4                       |  |  |  |  |

Muslim population within the total population of each country were obtained from the Pew Research Center website (<u>www.pewresearch.org</u>).

To examine the relationship between the financial performance of countries' Islamic banks and the Muslim population ratios, Spearman's rank correlation coefficient was calculated. The data from Table 10 were used for the calculation.

| Countries            | Country Performance Ranking<br>According to the WEDBA Method | Muslim Population Ratios |
|----------------------|--|--------------------------|
| Saudi Arabia         | 1  | 1                        |
| Malaysia             | 2  | 8                        |
| Kuwait               | 3  | 6                        |
| United Arab Emirates | 4  | 2                        |
| Qatar                | 5  | 5                        |
| Bahrain              | 6  | 18                       |
| Türkiye              | 7  | 13                       |
| Bangladesh           | 8  | 12                       |
| Indonesia            | 9  | 15                       |
| Brunei Darussalam    | 10   | 4                        |
| Egypt                | 11   | 3                        |
| Iraq                 | 12   | 10                       |
| Jordan               | 13   | 9                        |
| Nigeria              | 14   | 7                        |
| Oman                 | 15   | 16                       |
| United Kingdom       | 16   | 14                       |
| Palestine            | 17   | 11                       |
| Sudan                | 18   | 17                       |
| Pakistan             | 19   | 19                       |

Spearman's rank correlation coefficient was calculated using Stata 15.1 software. The hypothesis established is as follows:

H<sub>0</sub>: There is no relationship between the financial performance ranking of countries' Islamic banks and the Muslim population they have.

 $H_A$ : There is a relationship between the financial performance ranking of countries' Islamic banks and the Muslim population they have.

The results of the calculation are shown in Table 11.

| Table 11. Results of Spearman's Rank Correlation Coefficient |        |  |
|--|--------|--|
| Number of obs.   | 19     |  |
| Spearman's rho   | 0.5634 |  |
| Prob.  | 0.0111 |  |

Upon examining the analysis results, 0.0111 < 0.05, indicating that the null hypothesis is rejected. With 95% confidence level, there is a moderately positive linear relationship in the same direction between the financial performance of countries' Islamic banks and the Muslim population they have.

## **5. CONCLUSION**

In countries with high levels of development, welfare, and a dense Muslim population, the desire of Muslims to avoid interest has led to the search for alternative ways outside of traditional banking. This has paved the way for the emergence of Islamic financial institutions as an alternative to interest-based financial systems. Banks established based on Islamic banking principles have rapidly grown in the market by offering products and services that cater to Islamic sensitivities while functioning similarly to traditional banks. In recent years, Islamic banking has gained demand not only in countries with a predominantly Muslim population but also in other countries. The main reason for this is that the products and services offered by Islamic banking cater to both Muslims and non-Muslims. Additionally, the resilience of Islamic banks in times of crisis has positively influenced the perception of Islamic banking.

This study examines the relationship between the financial performance of countries operating in the Islamic banking sector. The analysis identifies Iraq, Sudan, and Egypt as the top three countries in terms of financial performance based on six selected criteria. The superior financial performance of these countries is attributed to their higher liquidity asset ratios compared to other countries. Furthermore, the fact that liquidity assets have the highest importance weight among the six criteria supports this result. The analysis also reveals a positive and moderate correlation between the Muslim population of countries and their financial performance. The most general inference drawn from this analysis is that Islamic banking is more developed in countries with a dense Muslim population. However, the moderate correlation suggests that the Muslim population is not the sole factor influencing this outcome. Recent studies indicate that Islamic banking products and services are not only attractive to Muslims but also to non-Muslims. The resilience of Islamic banking during times of crisis is another reason for its preference in countries with a significant non-Muslim population. Although the market share of Islamic banking remains relatively low in many countries, it is continuously increasing its growth rate in the market sector. This sustainable position of Islamic banking further enhances its popularity. Based on research findings, it is predicted that the position of the Islamic banking sector will continue to strengthen in the financial markets of many countries in the future.

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