5-17-2021

DEA on Islamic Banking: A Bibliometric Study and Critical Perspective

Aam Slamet Rusydiana
SMART Indonesia, aamsmart@gmail.com

Rafika Rahmawati
Universitas Islam 45 Bekasi, Indonesia, fika.unismabekasi@gmail.com

Shafitranata Shafitranata
STIE Al-Madani Bandar Lampung, Indonesia, shafitranata@almadani.ac.id

DEA on Islamic Banking: A Bibliometric Study and Critical Perspective

Aam Slamet Rusydiana[1], Rafika Rahmawati[2], Shafitranata[3]

Sharia Economic Applied Research & Training (SMART) Indonesia. *Email: aamsmart@gmail.com
[2] Universitas Islam 45 Bekasi, Indonesia. *Email: fika.unismabekasi@gmail.com
[3] STIE Al-Madani Bandar Lampung, Indonesia. *Email: shafitranata@almadani.ac.id

Abstract

This study aims to determine the map of the development of Islamic Bank DEA research. DEA or Data Envelopment Analysis is one method for efficiency and productivity measurement. The data analyzed were in the form of publication of the DEA application research on Islamic banking totaling 201 articles. Map of the development of Islamic Bank DEA field research is obtained through the export process into the .txt file format. The export data is then processed and analyzed using the VOSviewer application program to determine the bibliometric map of the development of the DEA Islamic Bank application research. The results showed that the number of publications on the results of research on the DEA Islamic Bank application from 2004-2019 had increased significantly and was the most published in the International Journal of Islamic and Middle Eastern Finance and Management. Network visualization shows that the map of the development of the DEA Islamic Bank application research is divided into 4 clusters. Cluster 1 consists of 7 topics, cluster 2 consists of 4 topics, cluster 3 consists of 3 topics, and cluster 4 consists of 2 topics. The author who published the most research results on the DEA Islamic Bank application was Fakhrudin Kamarudin. Besides, the largest contributor to the publication of research results in the DEA Islamic Bank was the Faculty of Economics and Management Universiti Putra.

***Keywords**: DEA, Bibliometric, Islamic Bank, Data Envelopment Analysis Efficiency*

I. INTRODUCTION

Data Envelopment Analysis is often referred to as DEA, which specifically looks at each business unit's efficiency level. There will be changes in the level of efficiency used based on predetermined input and output. Data Envelopment Analysis is also used to analyze changes in performance over time. Charnes, Cooper, and Rhodes first introduced data envelopment analysis in 1978 and 1979. Since then, this approach using DEA has been widely used in operational research and management science. The DEA approach emphasizes a task-oriented approach and focuses more on an important task, namely evaluating the decision-making unit's performance (DMU).

This DEA method is one of the most frequently used analyses in research measuring a business unit (Decision Making Unit/DMU), especially the banking industry. This is because the DEA analysis does not require much data, and fewer assumptions are required. However, the DEA can also be applied in other, more general areas of research (Rusydiana et al., 2021). Other efficiency measures that are less frequently used include ratio analysis, least-squares regression (LSR), total factor productivity (TFP), and stochastic frontier analysis (SFA).

As mentioned above, most DEA and MPI methods are in the banking and financial industry, including Islamic banking. The issue of Islamic banking and finance is still an interesting issue to research. Islamic finance in Indonesia only appeared around 1992, which Bank Muamalat Indonesia pioneered. After that, they began to develop Islamic Commercial Banks, Sharia Business Units, Sharia Rural Banks (BPRS), Sharia Cooperatives, Sharia Insurance, Sharia Pawnshops, Waqf, and other Sharia Financial Institutions. According to Nurfalah et al. (2018), Islamic banking is relatively more stable than conventional banking in facing shocks both internally and externally. This is an interesting finding that needs to be proven through various research in the future.

Currently, the Islamic financial economy is experiencing euphoria, both in developing countries or even in developed countries. The financial industry and other forms of Islamic economic institutions are growing worldwide, from the Middle East, Asia to Western countries such as Britain. In Indonesia, the Islamic economy has largely transformed into the sharia financial industry, particularly Islamic banks, which are also the most 'sold' entities after the 1997 monetary crisis. This excellent opportunity must also be balanced by the ability of Islamic banks to manage funds efficiently. For this reason, measuring the efficiency of Islamic banks is very important.

Research on measuring the level of DEA efficiency in Islamic banks has been widely carried out. However, there is also a need for research that describes the mapping of DEA efficiency research in Islamic banks. Mapping of DEA efficiency research in the public sector has been done a lot. One of them is research conducted by Lampe & Hilgers (2015), who conducted a bibliometric analysis comparing DEA and SFA in various sectors. Mapping research on the efficiency of DEA in Islamic banks is very important to see the concept of a research framework for other researchers who will examine the efficiency of Islamic banks, especially with the DEA approach.

This study will try to capture the application of research with the method of measuring efficiency with Data Envelopment Analysis (DEA) in the theme of Islamic Bank. Some

formulations of the problems in this research include, first, how is the composition of research related to the DEA method in measuring efficiency in Islamic banking in general. Then what is the percentage of the number of publications, objects of study, so many citations in the journal application of the DEA method in measuring efficiency in Islamic banking during the last 16 years (2004-2019). This research will try to answer some of these questions.

II. THEORETICAL BASIS

Bank efficiency is the bank's ability to operate at lower costs related to lower lending or financing interest rates (Shamshur & Weill, 2019). Measuring efficiency with the frontier approach is divided into two: a deterministic approach, which is commonly called a non-parametric approach. This approach uses Technical Mathematics Programming, or popularly known as Data Envelopment Analysis/DEA. Second, the Stochastic Approach is classified as a parametric approach, using the Econometric Frontier.

Measurement of efficiency in Islamic banking institutions using the DEA approach has been carried out in many countries. Shawtari et al. (2019) compared the impact of efficiency on Islamic banks' margins and conventional banks in Yemen. His research results indicate that efficiency is needed in increasing competitiveness and reducing bank margins/interest. Rahim (2016) also linked the competitiveness index with the efficiency level of banks in Malaysia. The results show that the level of competition will drive efficiency.

Meanwhile, Sufian and Noor (2009) compared Islamic banks' performance in the Middle East and North Africa (MENA) and ASEAN countries. The results show that Islamic MENA banks have a higher DEA efficiency level. Based on the Tobit model results, Islamic banks with smaller market share and low non-performing financing levels will be more efficient.

The measurement of DEA efficiency is also carried out in comparative research, either comparing the level of DEA efficiency in two business entities or comparing DEA efficiency with other approaches' efficiency levels. Comparison of efficiency in two business entities, as done by Shawtari et al. (2018), compares the level of efficiency in Islamic banks with conventional banks. The results show that the level of efficiency of Islamic banks is higher than conventional banks. The factors that influence the level of efficiency are also different between Islamic banks and conventional banks.

Mostafa (2009) compared bank performance with the DEA efficiency approach and the Probabilistic Neural Network (PNN). The results show that comparing the performance with the two models yields very similar predictive accuracy. Meanwhile, Rusydiana (2018) compares the DEA's efficiency with bank productivity through the Malmquist Productivity Index (MPI) approach. This study tries to analyze the CCR model as a basic model in the DEA to see the efficiency of Islamic commercial banks in Indonesia for the 2012-2016 period. Furthermore, the Malmquist index is used to see the level of productivity of Islamic banks, both in terms of changes in efficiency and technology changes, which are then displayed in quadrant 4 groups. The results obtained from the Malmquist index score (TFP Change) show that 8 of the 11 Islamic banks experienced an increase in productivity or about 73% of all

Islamic commercial banks. A score of more than 1 indicates this. In comparison, the rest shows a relatively low level of productivity.

From some of the research literature that has been described, it can be concluded that the measurement of the efficiency of Islamic banks using the DEA approach has been widely used. For this reason, it is necessary to map out DEA efficiency research on these Islamic banks. One of the research mappings is the bibliometric approach.

Bibliometric mapping is an important research topic in the bibliometric field (Borner et al., 2003). Two distinguishable bibliometric aspects are the construction of the bibliometric map and the graphical representation of the map. In the bibliometric literature, the greatest concern is in the construction of the bibliometric map. Research related to the effects of differences in similarity measures tested with different mapping techniques (Van Eck and Waltman 2010). The graphic representation of the bibliometric map has received less attention. Although some researchers seriously study graphical representation issues (Chen, 2006), most articles published in the bibliometric literature rely on simple graphical representations provided by computer programs such as SPSS and Pajek. For thumbnails containing no more than 100 items, a simple graphical representation usually yields satisfactory results. However, there appears to be a trend towards larger maps (e.g. Klavans and Boyack 2006), and for such maps, the simple graphic representation is not adequate. A large bibliometric map's graphical representation can be further improved using a zoom function, special labeling algorithms, and density metaphors. Such functionality is not included in the computer programs commonly used by bibliometric researchers. In this paper, we introduce a new computer program for bibliometric mapping. This program pays special attention to the graphical representation of bibliometric maps.

This section discusses the use of VOS, which is to build a bibliometric map. VOS's purpose is to place items in such a low dimension that the distance between the two items accurately reflects the items' uniformity or association. For each pair of items, i and j, VOS requires a similarity input sij (sij ≥ 0). VOS treats the equation sij as a measure on a ratio scale. The equation sij is usually calculated using the association's strength defined in Equation 1 (e.g., Van Eck et al., 2010). VOS determines the location of items on the map by minimizing this equation:

$$V(x_i, \dots, x_n) = \sum_{i<j} s_{ij} \left\| x_i - x_j \right\|^2 \qquad (1)$$

to:

$$\frac{2}{n\,(n-1)} \sum_{i<j} \left\| x_i - x_j \right\| = 1 \qquad (2)$$

Therefore, VOS's idea is to minimize the weighted sum of the squares of the distance between all pairs of items. The equation between those items weights the square of the distance

between pairs of items. To avoid worthless solutions, where all items from the objects have the same location, limits are imposed so that the average distance between two items must be equal to one.

Two computer programs have implemented the VOS mapping technique. Both are available free of charge. A simple open-source program is available at www.neesjanvaneck.nl/vos/, and a more advanced program called VOSviewer (Van Eck & Waltman, 2010) is available at www.vosviewer.com. Both programs use the variant of the SMACOF algorithm mentioned above to minimize Equation 1 to Equation 2. Some examples of the application of bibliometrics in Islamic economic and finance research can be found in Rusydiana et al. (2020), Antonio, et al. (2020), Laila et al. (2021), and Rusydiana (2021).

III. RESEARCH METHODS

This research uses data to search for google scholar publications with the keyword DEA Islamic Bank with the category of the article title, abstract, keywords in the period 2004 - 2019. From the search results, 201 published articles were obtained. Data in the form of a year of publication and the research country's location by each published article were analyzed using Microsoft Excel 2010. Meanwhile, the development of DEA research publications in Islamic banks was analyzed using the VOSViewer software.

The computer program that we are introducing is called VOSviewer. VOSviewer is a program we developed to build and view bibliometric maps. This program is freely available to the bibliometric research community (see www.vosviewer.com). VOSviewer, for example, can be used to create author maps or journals based on cocitation data or to build keyword maps based on shared incident data. The program offers a viewer that allows the bibliometric map to be examined in detail. VOSviewer can display maps in a variety of ways, each emphasizing a different aspect of the map. It has functions for zooming, scrolling, and searching, which facilitate detailed inspection of the map. VOSviewer's viewability is particularly useful for maps containing at least a large number of items (e.g., at least 100 items). Most computer programs used for bibliometric mapping do not satisfactorily display such maps.

VOSviewer uses the VOS mapping technique, where VOS stands for similarity visualization. For previous studies in which VOS mapping techniques were used, we refer to Van Eck and Waltman (2007). VOSviewer can display maps built using suitable mapping techniques. Therefore, this program can be used to display maps built using the VOS mapping technique and display maps built using multidimensional scaling or MDS techniques. VOSviewer runs on many hardware and operating system platforms and can be started directly from the internet.

Here is a detailed description of each stage's process and a description of this bibliometric research stages.

Table 1: Research stages with bibliometric analysis

No	Stages	Description
1	Selection of the object of analysis and the scientific basis	(a) Define the work's scientific and theoretical fields (b) Delimit the work's objectives (c) Choose the scientific basis on which the article's research will be conducted
2	Searching procedures	(a) Define the search terms (b) Define the engines for an advanced search (c) Define the search filters
3	Collecting and structuring the data	(a) Choose the reference manager software (b) Define the bibliometric analysis software (c) Download the references from the reference manager, bibliometric and electronic spreadsheet format (d) Import the files to the reference manager software
4	Contextual analysis of the scientific output to the sample	(a) Analysis of the temporal volume of the selected journal (b) Analysis of the citations of the selected articles (c) Analysis of the countries of origin of selected articles (d) Analysis of the keywords of the selected articles (e) Analysis of the scientific areas of the selected articles (f) Analysis of the detailed (full) keywords (g) Analysis of the future direction of research (h) Methodology classification & the nature of articles
5	Analysis of the citation networks carried out by the sample	(a) Analysis of citations & co-cite of the overall sample (b) Analysis of the most cited authors (c) Analysis of the main journals

Source: Adjusted from Costa et al. (2017)

IV. RESULTS AND DISCUSSION

In this study, 201 studies whose authors reviewed research were carried out from 2004 to 2019. During that period, research related to DEA use in research related to Islamic banking continued to increase every year. It is recorded that from 2010 there was a significant increase until 2019, where the number did not always increase and decreased. The three years with the most paper publications were in 2013, 2015, and 2018. The total number of respectively was 22, 24, and 25 papers. This illustrates that every year research related to the Islamic banking industry's DEA analysis model has increased. Below is a table of the year of publication and the number of papers each year.

Table 2: Publication Classification Based on Issuance Year

No.	Year of Publication	Number of Articles
1	2019	16
2	2018	25
3	2017	15
4	2016	16
5	2015	24
6	2014	15
7	2013	22
8	2012	18
9	2011	13
10	2010	13
11	2009	7
12	2008	5
13	2007	4
14	2006	6
15	2005	1
16	2004	1

Furthermore, in this study, the 201 papers reviewed by the authors were classified based on studies conducted in certain countries as well as comparisons between countries. Of 201 country case study papers, the most DEA research on Islamic banking occurred in Indonesia with 59 papers and Malaysia with 47 papers. Apart from these two countries, the researchers also researched countries in the Middle East, including GCC or MENA, to conduct DEA research on banking. The list of countries and the number of papers can be seen in the following table.

Table 3: Publication Classification Based on Country Studies

No.	Country	Studied Area
1	Indonesia	59
2	Malaysia	47
3	Pakistan	22
4	Bangladesh	14
5	GCC	12
6	MENA	10
7	Saudi Arabia	10
8	Turkey	9
9	UAE	9
10	Yaman	8

4.1. Map of DEA Research Development on Islamic Banks

The following results were obtained from the database's search results collected as many as 201 documents then exported to .txt format, input, and analyzed with VOSViewer.

4.1.1 Co-word Map Network Visualization

The results of the co-word map analysis of these keywords form the basis for the co-occurrence mapping of important or unique terms contained in certain articles. Mapping is a process that enables a person to recognize elements of knowledge and their configuration, dynamics, interdependencies, and interactions. Knowledge mapping is used for technology management purposes, including the definition of research programs, decisions related to technology activities, the design of knowledge base structures, and the creation of educational and training programs. Related to bibliometrics, science mapping is a method of visualizing a field of science. This visualization is done by creating a landscape map displaying science topics (Royani et al., 2013). The visualization of the DEA Islamic Bank research co-word map network can be seen in Figure 1.

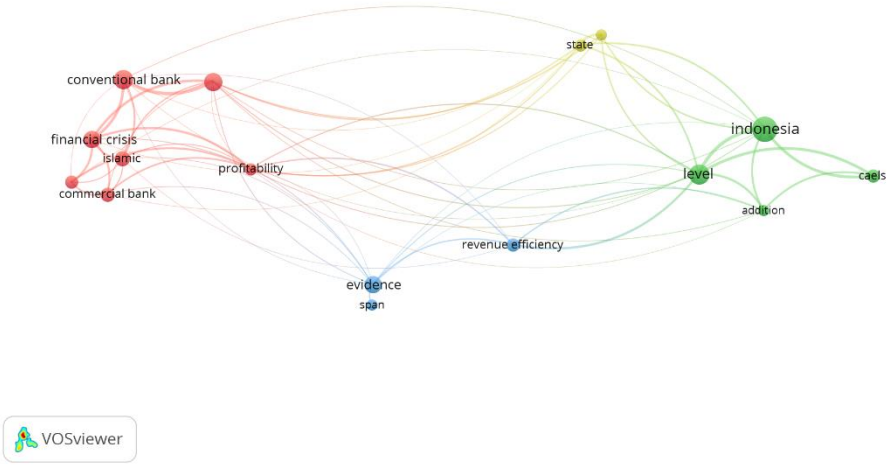


Figure 1: Visualization of the co-word map network of the DEA Islamic Bank research development

Figure 1 shows that the map of DEA research development on Islamic banks is divided into 4 clusters as follows.

- Cluster 1 in red consists of 7 topics: commercial bank, conventional bank, financial crisis, impact, Islamic, profitability, and technical efficiency.
- Cluster 2 in green consists of 4 topics, namely addition, caels, Indonesia, and level.
- Cluster 3 in blue consists of 3 topics, namely evidence, revenue efficiency, and span.
- Yellow cluster 4 consists of 2 topics, namely Indonesian Islamic Bank and state.

4.1.2 Visualisation of the Co-Authors Density Map

The cluster density view is the item (label) marked the same as the visible item. Each item dot has a color depending on the density of the item at that time. This identifies that the map points' color depends on the number of items associated with other items. This section is very useful for obtaining an overview of the bibliometric map's general structure by paying attention to which parts of the items are considered important. Through this worksheet, we can interpret the authors who have written the most publications. Visualization of the density map of co-authors on DEA Islamic Bank research development can be seen in Figure 2.

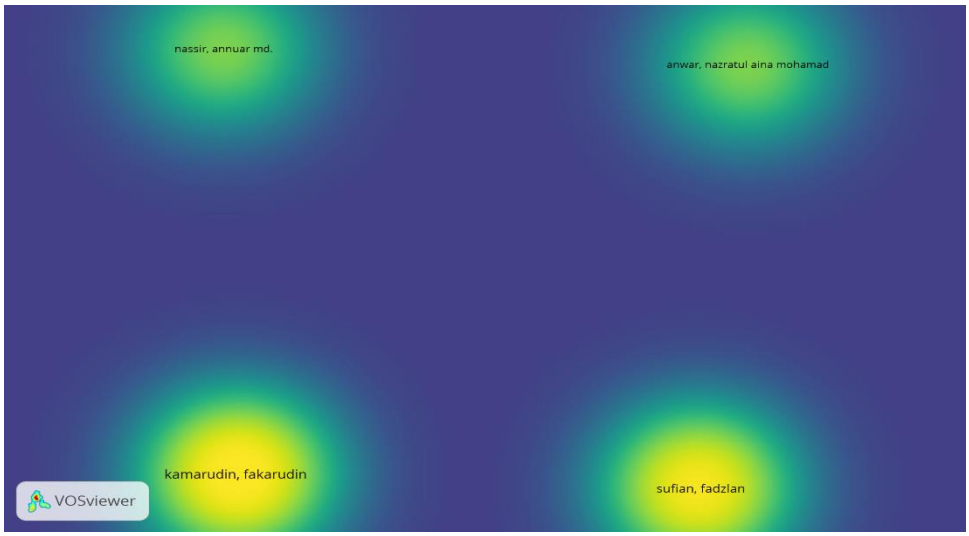


Figure 2: Visualization of density map co-author of DEA Islamic Bank's research development

Figure 2 shows the density map, which results from the analysis using all articles on DEA Islamic Bank research development, both related and unrelated. There is 1 cluster if sorted by author. The authors who write the most publications related to this topic are Fakhrudin Kamarudin, Fadzlan Sufian, Nazratul Aina Mohamad Anwar, and Annuar Md. Nassir.

4.1.3. Visualisation of Co-Sources Map Overlay

The results of the visualization of the co-sources map overlay for the development of research on efficiency in Islamic bank are divided into 10 clusters, as in Figure 3 below. Cluster 1 consists of two journals: the International Journal of Islamic and Middle Eastern Finance and Management and the Journal of Finance Reporting and Accounting. Cluster 2 consists of two journals, namely the Bulletin of Monetary Economics & Banking and the Journal of Islamic Accounting & Business Research. Cluster 3 consists of one journal, namely Al-Iqtishad: Journal of Islamic Economics. Cluster 4 consists of one journal, namely the Asian Economic and Financial Review. Cluster 5 consists of one journal, namely Expert Systems with Application. Cluster 6 consists of one journal, namely the Global Business Review. Cluster 7

consists of one journal, namely the International Journal of Academic Research in Economics and Management Sciences. Cluster 8 consists of one journal, namely the Journal of Applied Business Research (JABR). Cluster 9 consists of one journal, namely the Journal of Islamic Banking, and cluster 10, consisting of one journal: Management Finance.

Figure 3: Visualization of the map overlay co-sources of the DEA Islamic Bank research development

4.1.4. Visualisation of Network Map Co-Organizations

The results of the visualization of the network map of co-organizations on the development of research on this topic are divided into 2 clusters, as in Figure 4 below. Cluster 1 consists of the Faculty of Economics and Management Universiti Putra Malaysia, Sapura Group Companies, King Abdul Aziz University, Collage of Business Administration Prince Sultan University Saudi Arabia, and Collage of Business Universiti Utara Malaysia. Cluster 2 consists of the Department of Accounting College of Business Management and Accounting, Universiti Tenaga Malaysia, Department of Economics, Faculty of Economics and Administration, University of Malaya, Department of Financial Management of National Defense University of Taiwan, and Faculty of Management of Canadian University Dubai.

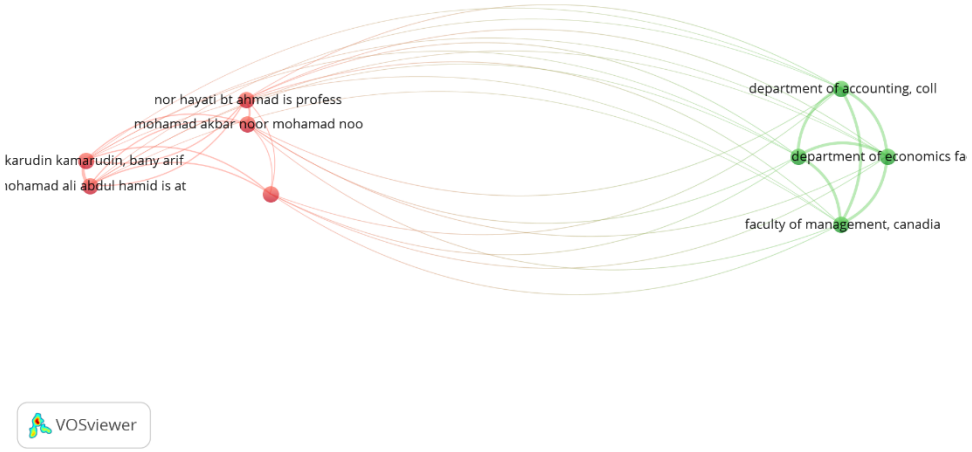


Figure 4: Visualisation of the network map of the Islamic Bank DEA research development co-organizations

4.2. Discussion

The following is a framework for measuring Islamic banks' efficiency and productivity, which is generally used based on literature studies. Efficiency issues are related to cost control issues. Efficiency means that the costs incurred to generate profits are less than the profits derived from the use of these assets. Efficiency in banks is very important because the competition level between banks is getting higher, and the standard of service is also getting higher. Banks that are unable to achieve optimal efficiency levels will lose competitiveness.

Management of funds in Islam also requires healthy and optimal management so that no funds are wasted. In measuring efficiency, there are 2 approaches, first, through parametric approaches, including the Stochastic Frontier Approach (SFA), Thick Frontier Approach (TFA), and Distribution Free Approach (DFA). Second, through non-parametric approaches, including Data Envelopment Analysis (DEA) and Free Disposable Hull (FDH).

The most widely used efficiency measurement is the DEA approach. This is because DEA is a non-parametric statistical approach that only requires a few assumptions (Yahya et al., 2012). DEA is an approach to estimating organizations' production function and organizational units that assess their efficiency (Mostafa, 2009). From several studies, measuring Islamic banks' performance is measured through efficiency approaches such as DEA (for example, Mostofa. 2011, Sufian and Mohamad 2009, Sakti and Azhar 2018, Wahab and Razali, 2017).

In measuring the DEA model's efficiency level, there are 2 models used in analyzing the efficiency of an Economic Activity Unit (UKE). The first model to be developed is a model with the assumption of constant return to scale (CRS) or the so-called CCR model (Charnes-Cooper-Rhodes). In the constant return to a scale model, each UKE will be compared with all UKE in the sample with the assumption that the internal and external conditions of UKE are the same. Meanwhile, the second model developed in measuring efficiency is a model with the assumption of a variable return to scale (VRS) or commonly referred to as the BCC (Bankers-Charnes-Cooper) model. In this model, it is assumed that all UKE conditions are not

the same, or it can be said that not all UKE operate optimally. The main difference between these two models is the treatment of the yield scale.

DEA efficiency studies using the CRS approach include… While DEA efficiency studies with the VRS approach include Faruk et al. (2017), which underlie the VRS approach's selection because their research is output-oriented. Some studies use both approaches, such as research by Omar et al. (2006), Mostafa (2009), Shah et al. (2019). In Shah's research et al. (2019), the CRS model is used to maximize some of the output generated by several inputs, where the highest score of a DMU is 1.While the VRS Model represents Pure Technical Efficiency (PTE) without including Scale Efficiency (SE).

In addition to efficiency, the measurement of the performance of Islamic banks is also measured through the level of productivity, one of which is the MPI (Malmquist Productivity Index) approach as done by Rusydiana (2018), Kamarudin et al. (2017), Rashidah and Faisal (2015), Sufian, and Kamarudin (2014).

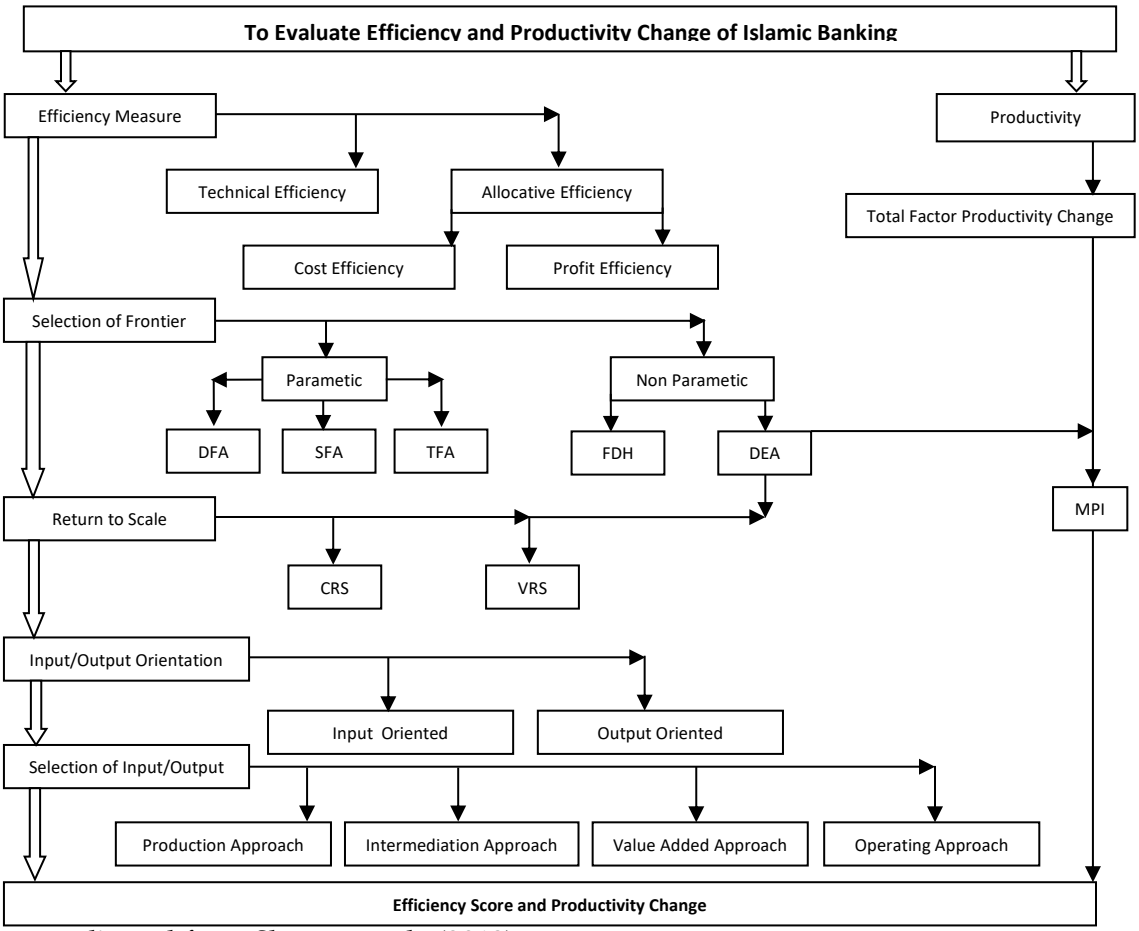
In measuring productivity, the method most widely used is the total factor productivity (TFP) method. This method is used to overcome the weakness of calculating the efficiency of more than one input and one output. TFP is measured using an index number that measures changes in price and quantity over time. Also, TFP measures comparisons and differences between entities.

The TFP index measures the change in the output value of a selected number of N from "a" to "b," where p represents the output price. The indexes used to measure TFP include the Malmquist Index, Laspeyres Index, Pasche Index, Fisher Index, and Tornqvist Index. The Malmquist Index or Malmquist Productivity Index (MPI) is the index most often used to measure TPF.

The Malmquist index is part of the DEA method, which specifically looks at the productivity of each business unit. There will be changes in efficiency and technology based on predetermined inputs and outputs (Rusydiana, 2018). In addition to knowing the level of efficiency of an Islamic bank, DEA also relates it to the Malmquist-productivity of Islamic banks.

The first and very important step in calculating the DEA's efficiency is the determination of input and output (Mostafa, 2011). Several approaches are used in determining input-output in bank efficiency research, namely the production approach, the intermediation approach, the operating approach, and the profit approach (Srairi and Imen, 2012). These four approaches are the most widely used in research.

In the production approach, banks are seen as companies providing services to their customers in transactions. The benchmarking model examines how well different banks combine their resources to support the largest possible number of transactions. Meanwhile, banks are seen as the main intermediary funds between savers and investors in the intermediation approach.



Source: adjusted from Sharma et al., (2013)

Figure 5: Conceptual Framework of Islamic Banking Efficiency And Productivity

The definition of efficiency according to Islam is not the same as according to conventional economic theory. This is because the orientation of the life of a Muslim human being is not limited to his world alone, but the integration of the life of the world and the hereafter, where the world is only a field for life in the hereafter. Finally, it is very possible that the implementation of efficiency in Islam is incompatible with conventional efficiency or vice versa. If the limitation of conventional economics is the legality and rules of criminal law as long as the applicable law is in accordance with the Sharia, then it is also in accordance with the Islamic view.

V. CONCLUSION

Based on the results and discussion, the following conclusions were obtained. The number of publications on developing research results in the DEA Islamic Bank field from 2004-2019 has increased significantly. The network visualization shows that the DEA Islamic Bank research development map is divided into 4 clusters. Cluster 1 consists of 7 topics, cluster 2 consists of 4 topics, cluster 3 consists of 3 topics, and cluster 4 consists of 2 topics. The author, who has

published the most research results from DEA Islamic Bank, is Fakhrudin Kamarudin. The publication's name that most publish DEA Islamic Bank research results is the International Journal of Islamic and Middle Eastern Finance and Management. The largest contributor to the DEA Islamic Bank results' publication is the Faculty of Economics and Management, Universiti Putra.

Based on Cholik (2013) from the relationship between 'Iqtisadiyyah', and 'Iqtisad' which comes from the root word 'qasdu', it shows that many terms in Arabic are musytarak where the meanings of words are related to one another. It is through the meanings in the origin of the word 'Iqtisad' which then becomes the foundation of the economic concept in Islam.

The word efficiency as an economic principle is indeed a benchmark in every person's economic action, but without clear boundaries it is very possible that this principle is misused and becomes an opening for fraud by market players so far. Therefore, both the terms efficiency and economy in Islamic perspective are not value free. In the view of Islam, the term Iqtisad is used because it is in accordance with the breath and Islamic law, where this word has a much broader meaning than the word economy itself (Cholik, 2013).

REFERENCES

Abduh, M., Hasan, S. M., & Pananjung, A. G. (2013). Efficiency and performance of Islamic banks in Bangladesh. *Journal of Islamic Banking and Finance*, *30*(2), 94–106. Retrieved from http://irep.iium.edu.my/30750/

Ada, A. A., & DALKILIÇ, N. (2014). Efficiency Analysis in Islamic Banks : A Study for Malaysia and Turkey. *BDDK Bankacılık ve Finansal Piyasalar*, *8*(1), 9–33.

Adawiyah, W. R. (2015). The Impact of Financial Liberalization on Islamic Bank's Efficiency in Indonesia. *Al-Iqtishad: Journal of Islamic Economics*, *7*(2), 141–150. https://doi.org/10.15408/ijies.v7i2.1680

Afiatun, P., & Wiryono, S. (2002). Efficiency and Productivity of Indonesian Islamic Banking. *Journal of Technology Management*, *9*(3), 264–278.

Ahmad, H. K., Mujaddad, H. G., & Nadeem, M. (2015). An Analysis of Banks Performance in Pakistan Using Two-Step Double Bootstrap Dea Approach. *Pakistan Economic and Social Review*, *53*(2), 331–350. Retrieved from https://search.proquest.com/docview/1792214378?accountid=17242

Ahmad, N. H. B., Noor, M. A., & Sufian, F. (2011). Measuring Islamic Banks Efficiency : The Case of World Islamic Banking Sectors. *MPRA Paper*, (29497), 1–24.

Ahmad, S., Jusoh, W. N. H., Rahman, A., & Rahim, A. (2012). Measuring the Malaysian Islamic subsidiaries and commercial banks' efficiency. *International Conference on Economics, Business Innovation*, *38*, 7–11. Retrieved from http://irep.iium.edu.my/25155/

Ahmad, S., & Rahim Abdul Rahman, A. (2012). The efficiency of Islamic and conventional commercial banks in Malaysia. *International Journal of Islamic and Middle Eastern Finance and Management*, *5*(3), 241–263. https://doi.org/10.1108/17538391211255223

Aik, N.-C., & Tan, K.-E. (, 2012). A study of cost and profit efficiency of the full-fledged Islamic banks and Islamic windows in Malaysia. *SEGi Review*, *5*(1), 41–46.

Aisyah, S., & Hosen, M. N. (2018). Total Factor Productivity and Efficiency Analysis on Islamic

Banks in Indonesia. *Jurnal Keuangan Dan Perbankan*, *22*(1), 137–147. https://doi.org/10.26905/jkdp.v22i1.1333

Akhtar, M. H. (2010). Technical efficiency and productivity growth of Saudi banks: A data envelopment analysis approach. *Global Business Review*, *11*(2), 119–133. https://doi.org/10.1177/097215091001100201

Al-Farisi, A. S., & Hendrawan, R. (2010). Measuring Efficiency as Intermediation Approach Between Conventional and Sharia Banks in Indonesia. *Jurnal Keuangan Dan Perbankan*, *14*(3), 501–508.

Al-Khasawneh, J. A., Bassedat, K., Aktan, B., & Thapa, P. D. P. (2012). The efficiency of Islamic banks: case of North African Arab countries. *Qualitative Research in Financial Markets*, *4*(2–3), 228–239. https://doi.org/10.1108/17554171211252547

Al-Shammari, P. M., & Turen, D. S. (2014). Assessing Relative Efficiency of Islamic Banks in Bahrain : An Application of Data Envelopment Analysis. *International Journal of Management Sciences and Business Research*, *3*(10), 36–48.

Alam, N. (2013). Impact of banking regulation on risk and efficiency in Islamic banking. *Journal of Financial Reporting and Accounting*, *11*(1), 29–50. https://doi.org/10.1108/jfra-03-2013-0010

Alfarisi, M. F., & Lukman, S. (2019). Measuring efficiency of Islamic banks: Evidence from Indonesia. *Jurnal Ekonomi & Keuangan Islam*, *5*(1), 1–9. https://doi.org/10.20885/jeki.vol5.iss1.art1

Ali, I. (2015). Measuring Efficiency of Islamic Banks in Bangladesh : an Application of Data Envelopment Analysis. *Manarat International University Studies*, *4*(1), 12–24.

Ali, M., & Abdullah, W. (2019). Efficiency Measurement in Yemeni Banks Using DEA Pre- and Post-Financial Reforms. *International Journal of Management and Human Science (IJMHS)*, *3*(1), 50–63.

Aljouni, M. M., & Hmedat, M. W. (2011). The Relative Efficiency of Jordanian Banks and its Determinants Using Data Envelopment Analysis. *Journal of Applied Finance and Banking*, *1*(3), 33–58.

Alrafadi, K. M. S., Kamaruddin, B. H., & Yusuf, M. M. (2015). THE TOTAL FACTOR PRODUCTIVITY OF LIBYAN BANKS , 2004 – 2010. *International Journal of Business, Economics, and Management*, *2*(4), 100–119.

Amin, S. I. M., Ali, M. H., & Nor, S. M. (2018). Cost Efficiency and Liquidity Risk in Banking: New Evidence from OIC Countries. *International Journal of Business and Management Science*, *8*(2), 255–276.

Amirillah, A. (2014). Efisiensi Perbankan Syariah di Indonesia. *JEJAK Journal of Economics and Policy*, *7*(2), 100–202. https://doi.org/10.15294/jejak.v7i1.3596

Antonio, M. S., Rusydiana, A., Laila, N., Hidayat, Y. R., & Marlina, L. (2020). HALAL VALUE CHAIN: A BIBLIOMETRIC REVIEW USING R. *Library Philosophy and Practice (ejournal)*, 4606.

Anwar, M. (2015). Efficiency of Sharia and Conventional Banks : *Proceeding of the Asia Pasific Conference on Business and Social Sciences*, 615–634.

Arsal, M., & Abdul Hamid, N. I. N. bt. (2017). the Profit Efficiency: Evidence From Islamic Banks in Indonesia. *Jurnal Kemanusiaan*, *15*(1), 71–76.

Arslan, B. G., & Ergec, E. H. (2010). The efficiency of participation and conventional banks in turkey: Using data envelopment analysis. *International Research Journal of Finance and Economics*, (57), 156–168.

Ascarya, & Yumanita, D. (2006a). Analisis efisiensi perbankan syariah di indonesia dengan

Data Envelopment Analysis. *TAZKIA Islamic Finance & Business Review*, *1*(2), 2–61.
Ascarya, & Yumanita, D. (2006b). Mengukur Efisiensi Bank Syariah di Indonesia dengan Data Envelopment Analysis. *TAZKIA Islamic Finance & Business Review*, *1*(2), 1–31.
Ascarya, & Yumanita, D. (2007). Measuring the Competitiveness of Islamic Banking in Indonesia Dual Banking System. *TAZKIA Islamic Finance & Business Review*, *2*(2), 72–89.
Ascarya, & Yumanita, D. (2008). Comparing The Efficiency of Islamic Banks in Malaysia and Indonesia. *Buletin Ekonomi Moneter Dan Perbankan*, *11*(2), 95–119. https://doi.org/10.1017/CBO9781107415324.004
Ascarya, & Yumanita, D. (2009). *Intermediation Efficiency Analysis of Islamic Rural Banks in Indonesia : Two Stage DEA Approach*.
Asmild, M., Kronborg, D., Mahbub, T., & Matthews, K. (2018). The efficiency patterns of Islamic banks during the global financial crisis: The case of Bangladesh. *Quarterly Review of Economics and Finance*, 1–26. https://doi.org/10.1016/j.qref.2018.04.004
Azad, M. A. K., Teng, K. K., & Abdul Talib, M. B. (2017). Modeling Bank Efficiency with Bad Output and Network Data Envelopment Analysis Approach. *Anadolu International Coference in Economics V*, 1–20. Retrieved from http://2017.econanadolu.com/admin1/dn_content/59071c284ea3c.pdf
Babatunde, A., & Olaitan, A. (2015). The conventional and presenting of Islamic banks in the UK : A comparative analysis. *Global Journal of Business and Management*, *3*(2), 50–59.
Banerjee, A., & Rafiuddin, A. (2015). An Essay on Returns to Scale of Banks in UAE. *Asian Journal of Management Sciences & Education*, *4*(1), 37–49. https://doi.org/10.14707/ajbr.150003
Basri, M. F., Muhamat, A. A., & Jaafar, M. N. (2018). The efficiency of Islamic banks in Malaysia: Based on DEA and Malmquist productivity index. *Journal of Emerging Economies & Islamic Research*, *6*(3), 15–27. Retrieved from www.jeeir.com
Ben Zeineb, G., & Mensi, S. (2018). Corporate governance, risk and efficiency: evidence from GCC Islamic banks. *Managerial Finance*, *44*(5), 551–569. https://doi.org/10.1108/MF-05-2017-0186
Bilal, H., Ahmad, K., Ahmad, H., & Akbar, S. (2011). Returns to scale of Islamic banks versus small commercial banks in Pakistan. *European Journal of Economics, Finance and Administrative Sciences*, (30), 136–151.
Börner, K., Chen, C., & Boyack, K. W. (2003). Visualizing knowledge domains. *Annual review of information science and technology*, *37*(1), 179-255.
Bushara, M. O. A., Aziz, Y. A. M., & Hussain, A. I. M. (2018). The sources of productivity change in Yemen Islamic banks : An application of Malmquist productivity index. *International Journal of Financial Management and Economics*, *1*(1), 39–45.
Čábelová, B. K. (2016). *Institute of Economic Studies Efficiency and Stability of Islamic Banking : Empirical Evidence from the Middle East Region*.
Chalik, A.A. (2013). Teori efisiensi dalam ekonomi Islam. *Jurnal Ekonomi Islam*, 1(2), 67-82.
Chen, C. (2006). CiteSpace II: Detecting and visualizing emerging trends and transient patterns in scientific literature. *Journal of the American Society for information Science and Technology*, *57*(3), 359-377.
Chiek, D. A. N., & Eng, T. K. (2011). Operational Effeciency of the full fledged Islamic Banks and Islamic Windows in Malaysia. *Banker's Journal Malaysia*, (136), 12.
Coskun, A., & Balci, E. (2018). An Efficiency Analysis of Interest-Free Banks : An International Comparison. *Journal of Insurance and Financial Management*, *4*(1), 78–97.
Costa, D.F., Carvalho, F.M., Moreira, B.C.M., and Prado, J.W. (2017). Bibliometric analysis on

the association between behavioral finance and decision making with cognitive biases such as overconfidence, anchoring effect and confirmation bias. *Scientometrics*, 111(3), 1775-1799.

Devi, A., & Firmansyah, I. (2018). Solution To Overcome the Bankruptcy Potential of Islamic Rural Bank in Indonesia. *Journal of Islamic Monetary Economics and Finance*, *3*, 25–44. https://doi.org/10.21098/jimf.v3i0.750

Dost, M. K. Bin, Ahmad, H. Z., & Warraich, K. (2011). Scale Efficiency of Islamic Banks of Pakistam. *Arabian Journal of Business and Management Review*, *1*(5).

Emrouznejad, A., & Anouze, A. L. (2009). A note on the modeling the efficiency of top Arab banks. *Expert Systems with Applications*, *36*, 5741–5744. https://doi.org/10.1016/j.eswa.2008.06.075

Erfani, G. R., & Vasigh, B. (2018). The impact of the global financial crisis on profitability of the banking industry: A comparative analysis. *Economies*, *6*(4), 1–13. https://doi.org/10.3390/economies6040066

Fakhrunnas, F., Nahar, F. H., & Albana, H. Fi. (2018). Effects of Macroeconomics Factors toward Efficiency in Banking. *JEJAK: Jurnal Ekonomi Dan Kebijakan*, *11*(2), 390–400. https://doi.org/10.15294/jejak.v11i2.16059

Faturohman, T. (2013). *An Examination of the Growth of Islamic Banking in Indonesia from 2003 to 2010*.

Ferhi, A., & Chkoudali, R. (2015). Islamic and conventional banks : Efficiency and stability during the current crises. *Journal of Research in Economics and International Finance*, *4*(2), 27–33.

Fiafifah, A. L., & Darwanto, D. (2019). Technical Efficiency Level of Islamic Bank in Indonesia. *Al-Uqud : Journal of Islamic Economics*, *3*(2), 114–132. https://doi.org/10.26740/al-uqud.v3n2.p114-132

Firdaus, M. F., & Hosen, M. N. (2013). Measurement of Efficiency and Soundness of Islamic Bank Using Two-Stage Data Envelopment Analysis and Modified Camels. *Journal of Islamic Banking & Finance*, *30*(3), 34–50.

Firdaus, M. F., & Hosen, M. N. (2014). Efficiency of Islamic Banks Using Two Stage Approach of Data Envelopment Analysis. *Buletin Ekonomi Moneter Dan Perbankan*, *16*(2), 155–176. https://doi.org/10.21098/bemp.v16i2.442

Firdaus, M. faza, & Hosen, M. N. (2013). Efisiensi Bank Umum Syariah Menggunakan Pendekatan Two-Stage Data Envelopment Analysis. *Buletin Ekonomi Moneter Dan Perbankan*, *16*(2), 167–188. https://doi.org/10.21098/bemp.v16i2.31

Ftiti, Z., Nafti, O., & Sreiri, S. (2013). Efficiency of Islamic banks during subprime crisis: Evidence of GCC countries. *Journal of Applied Business Research*, *29*(1), 285–304. https://doi.org/10.19030/jabr.v29i1.7615

Gishkori, M. A., & Ullah, N. (2013). Technical Efficiency of Islamic and Commercial Banks: Evidence from Pakistan Using DEA Model (2007-2011). *IOSR Journal of Business and Management*, *7*(4), 68–76. https://doi.org/10.9790/487x-0746876

Gümrah, A., Özcan, A. İ., & Canbolat, M. A. (2250). Technical Efficiency Analysis of Participation Banks that Operated Between 2005 and 2013 in Turkey. *International Journal of Emerging Technology and Advanced Engineering*, *5*(1), 1–5.

Hadi, F. S. A., & Saad, N. M. (2010). An analysis on the efficiency of the Malaysian Islamic banking industry: domestic vs. foreign. *Review of Islamic Economics*, *14*(1), 27–47.

Hafez, H. M., & Halim, M. (2019). The efficiency of Islamic banks versus conventional banks: An empirical study of an emerging economy. *Banks and Bank Systems*, *14*(2), 50–62.

https://doi.org/10.21511/bbs.14(2).2019.05
Haider, M. A., Raza, Q., Jameel, S., & Pervaiz, K. (2019). A comparative study of operational efficiency of Pakistani and Malaysian islamic banks: Data envelopment analysis approach. *Asian Economic and Financial Review*, *9*(5), 559–580. https://doi.org/10.18488/journal.aefr.2019.95.559.580
Hanen, H., Emrouznejad, A., & Ouertani, M. N. (2014). Technical efficiency determinants within a dual banking system: A DEA-bootstrap approach. *International Journal of Applied Decision Sciences*, *7*(4), 382–404. https://doi.org/10.1504/IJADS.2014.065223
Haque, A., & Tariq, A. (2012). Efficiency of Banks in Pakistan: A Non Parametric Approach. *Business and Economic Research*, *2*(1), 1–12. https://doi.org/10.5296/ber.v2i1.1711
Hassan, T., Mohamad, S., & Khaled I. Bader, M. (2009). Efficiency of conventional versus Islamic banks: evidence from the Middle East. *International Journal of Islamic and Middle Eastern Finance and Management*, *2*(1), 46–65. https://doi.org/10.1108/17538390910946267
Hassan, W. M. (2013). Efficiency of the Middle East Banking Sector –A Non Parametric Approach: A Comparative Analysis between Islamic and Conventional Banks. *Business and Management Research*, *2*(4), 116–128. https://doi.org/10.5430/bmr.v2n4p116
Havidz, S. A. H., & Setiawan, C. (2015a). A Comparative Study of Efficiency between Conventional and Islamic Banks in Indonesia. *Asian Economic and Financial Review*, *5*(5), 790–804. https://doi.org/10.18488/journal.aefr/2015.5.5/102.5.790.804
Havidz, S. A. H., & Setiawan, C. (2015b). Bank Efficiency and Non-Performing Financing (NPF) in the Indonesian Islamic Banks. *Asian Journal of Economic Modelling*, *3*(3), 61–79. https://doi.org/10.18488/journal.8/2015.3.3/8.3.61.79
Hayat, D. S., Anggraeni, L., & Bakhtiar, T. (2017). Efficiency Analysis of Bank Branches: Production and Profitability Approaches (Case Study of Bank EFG Syariah). *International Journal of Science and Research (IJSR)*, *6*(2), 2078–2082. https://doi.org/10.21275/ART20171272
Hosen, M. N., & Muhari, S. (2013). Efficiency of the Sharia Rural Bank in Indonesia Lead to Modified Camel. *International Journal of Academic Research in Economics and Management Sciences*, *2*(5), 34–53. https://doi.org/10.6007/ijarems/v2-i5/298
Hosen, M. N., & Warninda, T. D. (2014). Mapping of Efficiency and Profitability in Islamic Rural Bank in Indonesia. *International Journal of Academic Research in Business and Social Sciences*, *4*(7), 120–148. https://doi.org/10.6007/ijarbss/v4-i7/995
Hosen Nadratuzzaman, M., & Rahmawati, R. (2014). Analisis Efisiensi, Profitabilitas dan Kesehatan Bank Umum Syariah di Indonesia Periode 2010- 2013. *Finance and Banking Journal*, *16*(2), 207–227.
Hussain, N. E., Abdullah, H., & Shaari, M. S. (2012). Efficiency and profitability of islamic banking in malaysia. *Journal of Applied Sciences Research*, *8*(11), 5226–5241.
Ismail, F., Majid, M. S. A., & Rahim, R. A. (2013). Efficiency of Islamic and conventional banks in Malaysia. *Journal of Financial Reporting and Accounting*, *11*(1), 92–107. https://doi.org/10.1108/jfra-03-2013-0011
Ismail, M., & Rahim, H. A. (2009). Impact of Merger on Efficiency and Productivity in Malaysian Commercial Banks. *International Journal of Economics and Finance*, *1*(2), 225–231. https://doi.org/10.5539/ijef.v1n2p225
Jahan, N. (2019a). AN INVESTIGATION INTO THE EQUIVALENCY OF THREE PERFORMANCE DIMENSIONS : EVIDENCE FROM COMMERCIAL BANKS IN. *Asia-Pasific Management Accounting Journal*, *1*, 69–93.
Jahan, N. (2019b). Productivity Analysis of Commercial Banks of Bangladesh: A Malmquist

Productivity Index Approach. *International Journal of Economics and Financial Issues*, *9*(1), 108–115.

Javed, A., Ullah, N., & Malik, Q. A. (2015). Comparing the Efficiency of Islamic Banks of Pakistan and Malaysia : by using the Dea Approach. *Research Journal of Recent Sciences*, *4*(6), 45–52.

Johnes, J., Izzeldin, M., & Pappas, V. (2015). Efficiency and productivity change in Islamic and conventional banks: Evidence from the Gulf Cooperation Council (GCC) countries. *13th International Conference on Data Envelopment Analysis*. Retrieved from http://eprints.hud.ac.uk/27824/

Kadri, N., Rahim, R. A., & Abg. Abdillah, D. S. Z. (2016). The Efficiency Performance of Global Islamic Banks. *UNIMAS Review of Accounting and Finance*, *1*(1), 126–145. https://doi.org/10.33736/uraf.293.2016

Kaffash, S., Kazemi Matin, R., & Tajik, M. (2017). A directional semi-oriented radial DEA measure: an application on financial stability and the efficiency of banks. *Annals of Operations Research*, *264*(1–2), 213–234. https://doi.org/10.1007/s10479-017-2719-5

Kamarudin, F., Nordin, B. A. A., Muhammad, J., & Hamid, M. A. A. (2014). Cost, Revenue and Profit Efficiency of Islamic and Conventional Banking Sector: Empirical Evidence from Gulf Cooperative Council Countries. *Global Business Review*, *15*(1), 1–24. https://doi.org/10.1177/0972150913515579

Kamarudin, F., Sufian, F., Loong, F. W., & Anwar, N. A. M. (2017). Assessing the domestic and foreign Islamic banks efficiency: Insights from selected Southeast Asian countries. *Future Business Journal*, *3*, 33–46. https://doi.org/10.1016/j.fbj.2017.01.005

Kamarudin, F., Sufian, F., & Md. Nassir, A. (2016). Does country governance foster revenue efficiency of Islamic and conventional banks in GCC countries? *EuroMed Journal of Business*, *11*(2), 181–211. https://doi.org/10.1108/EMJB-06-2015-0026

Kamarudin, F., Sufian, F., & Nassir, A. M. (2016). Global financial crisis, ownership and bank profit efficiency in the Bangladesh;s state owned and private commercial banks. *Contaduria y Administracion*, *61*(4), 1–41. https://doi.org/10.1016/j.cya.2016.07.006

Kamarudin, F., Sufian, F., Nassir, A. M., Anwar, N. A. M., & Hussain, H. I. (2019). Bank Efficiency in Malaysia a DEA Approach. *Journal of Central Banking Theory and Practice*, *8*(1), 133–162. https://doi.org/10.2478/jcbtp-2019-0007

Kamarudin, F., Sufian, F., Ramli, N. A., Anwar, N. A. M., Tan, K. M., & Hussain, H. I. (2018). Price efficiency on Islamic banks vs. conventional banks in Bahrain, UAE, Kuwait, Oman, Qatar and Saudi Arabia: Impact of country governance. *International Journal of Monetary Economics and Finance*, *11*(4), 1–21. https://doi.org/10.1504/ijmef.2018.10012025

Kamarudin, F., & Yahya, M. H. (2013). Cost, revenue and profit efficiency in islamic vs. Conventional banks: Empirical evidence using data envelopment analysis (DEA). *Pertanika Journal of Social Science and Humanities*, *21*, 1–18.

Khalaf Al-Delaimi, K. S., & Battall Al-Ani, A. H. (2006). Using Data Envelopment Analysis To Measure Cost Efficiency With an Application on Islamic Banks. *Scientific Journal of Administrative Development*, *4*, 134–156.

Khaled I. Bader, M., Mohamad, S., Ariff, M., & Hassan, T. (2008). Cost, Revenue, and Profit Efficiency of Islamic Versus Conventional Banks: International Evidence Using Data Envelopment Analysis. *Islamic Economic Studies*, *15*(2), 24–76.

Khan, M. N., Amin, M. F. Bin, Khokhar, I., Ul Hassan, M., & Ahmad, K. (2018). Efficiency measurement of islamic and conventional banks in Saudi Arabia: An Empirical and Comparative analysis. *Al-Shajarah*, 111–134.

Khartabiel, G. M., Ahmad, T. S. T., & Bakar, R. (2018). Performance of Conventional and Shari´ah - Compliant Banks: A Data Envelopment Analysis Approach. *Asian Journal of Economics, Business and Accounting*, *8*(1), 1–24. https://doi.org/10.9734/ajeba/2018/43955

Klavans, R., & Boyack, K. W. (2006). Quantitative evaluation of large maps of science. *Scientometrics*, *68*(3), 475-499.

Kweh, Q. L., Lu, W. M., Nourani, M., & Ghazali Mohd Zain, M. H. (2018). Risk management and dynamic network performance: an illustration using a dual banking system. *Applied Economics*, *50*(30), 3285–3299. https://doi.org/10.1080/00036846.2017.1420889

Laila, N., Rusydiana, A.S., Irfany, M.I., HR, Imron, Srisusilawati, P., & Taqi, M. (2021). Energy economics in Islamic countries: A bibliometric review. *International Journal of Energy Economics and Policy*, 11(2), 88-95.

Lampe, H. W., & Hilgers, D. (2015). Trajectories of efficiency measurement: A bibliometric analysis of DEA and SFA. *European journal of operational research*, *240*(1), 1-21.

Lema, T. Z. (2017). Determinants of bank technical efficiency: Evidence from commercial banks in Ethiopia. *Cogent Business and Management*, *4*(1), 1–13. https://doi.org/10.1080/23311975.2016.1268356

Mahdi, I. B. S., & Abbes, M. B. (2018). Risk and inefficiency: Behavioral explanation through overconfidence in Islamic and conventional banks. *Managerial Finance*, *44*(6), 688–703. https://doi.org/10.1108/MF-04-2017-0130

Majdina, N., Munandar, J. M., & Effendi, J. (2019). The determinant factors of efficiency on Islamic banking and conventional banking in Indonesia. *Jurnal Keuangan Dan Perbankan*, *23*(3), 454–468.

Majid, M. A., & Hassan, M. K. (2011). The Impact of Foreign-Owned Islamic Banks and Islamic Bank Subsidiaries on the Efficiency and Productivity Change of Malaysian banks. *Journal of King Abdulaziz University, Islamic Economics*, *24*(2), 149–176. https://doi.org/10.4197/Islec.24-2.5

Mala, C. M. F., Rodoni, A., & Yaman, B. (2018). Market Power and Efficiency of Islamic Banking and Conventional Banking in Indonesia. *Global Review of Islamic Economics and Business*, *6*(2), 131–143.

Matar, A. (2017). Evaluating The Performance Of Islamic And Commercial Banks In Jordan : A Comparative Study. *Jordan Journal of Economic Sciences*, *4*(1), 57. https://doi.org/10.35516/1250-004-001-004

Matthews, K. (2014). Cost Inefficiency in the Pakistan Banking Sector 2002-2009. *SBP Research Bulletin*, *10*(1), 1–20.

Mezzi, N. (2018). Efficiency of Islamic banks and role of governance: empirical evidence. *Managerial Finance*, *44*(5), 590–603. https://doi.org/10.1108/MF-05-2017-0171

Minianoui, H., & Tchantchane, A. (2010). Investigating efficiency of GCC banks : a non-parametric approach. *The Business Review*, *14*(2), 78–84.

Miranti, D., & Sari, K. (2016). Efisiensi Bank Umum Syariah Di Indonesia Menggunakan Pendekatan Data Envelopment Analysis (Dea). *Jurnal Ilmiah Ekonomi Bisnis*, *21*(3), 194–200.

Mohamad, N. H., & Said, F. (2014). Assessing the Performance of Selected Financial Institutions in Malaysia using Super- Efficient DEA Model. *Australian Journal of Basic and Applied Sciences*, *8*(15), 137–144.

Mohamad, N. M., & Wahab, N. A. (2016). Examining the Relationship Between Risks and Efficiency of Islamic Banks in Malaysia. *IJB Journal*, *1*(2), 90–116.

Mohd, B. H. K., & Rohani, M. (2013). Efficiency Measurement and Determinants of Malaysian

Islamic Banking Operations. *Journal of Islamic Finance and Business Research*, *2*(1), 13–35.
Mortadza, N.-S., Ab-Rahim, R., & Dee, A. (2019). Market Structure and Efficiency of QISMUT Banking Sector. *International Journal of Academic Research in Business and Social Sciences*, *9*(6), 383–392. https://doi.org/10.6007/IJARBSS/v9-i6/5958
Mostafa, M. M. (2009). Modeling the efficiency of top Arab banks: A DEA-neural network approach. *Expert Systems with Applications*, *36*(1), 309–320. https://doi.org/10.1016/j.eswa.2007.09.001
Mostafa, M. M. (2011). Modeling Islamic banks' efficiency: a non-parametric frontier approach. *International Journal of Islamic and Middle Eastern Finance and Management*, *4*(1), 7–29. https://doi.org/10.1108/17538391111122186
Moualhi, M. (2015). Efficiency in Islamic Banking: Evidence from MENA Region. *International Journal of Islamic Economics and Finance Studies*, *1*(2), 5–21.
Moussawi, C. E. L., & Obeid, H. (2011). Evaluating the Productive Efficiency of Islamic Banking in GCC: A non Parametric Approach. *International Management Review*, *7*(1), 178–190.
Muda, M., Shaharuddin, A., & Embaya, A. (2013). Determinants of Banks Eficiency : A Panel Regression Analysis of Islamic Banks in Malaysia. *Economics and Finance Review Vol.*, *3*(3), 19–28.
Mustafa, S., & Mehmood, B. (2015). Efficiency Change in Pakistan Commercial Banking Sector: A Pre and Post Digital-Restructuring Analysis. *Journal of Emerging Economies and Islamic Research*, *3*(1), 1–10. Retrieved from http://www.jeeir.com/v2/images/Vol3No12015/142-317-2-PB.pdf
Nabi, G., Islam, A., & Bakar, R. (2019). Do Private Commercial Banks Outperform State-owned Commercial Banks ? Empirical Evidence from Bangladesh. *Journal of Applied Finance & Banking*, *9*(5), 167–186.
Nafla, A., & Hammas, A. (2016a). Islamic Banks, Conventional banks and Subprime Crisis: Empirical Evidence by Using DEA Approach. *Journal of Islamic Banking and Finance*, *4*(1), 10–21. https://doi.org/10.15640/jibf.v4n1a2
Nafla, A., & Hammas, A. (2016b). Islamic Finance, Financial Crisis, and Determinants of Financial Stability: Empirical Evidence throughout the Two Approaches. *Journal of Islamic Banking and Finance*, *4*(1), 47–59. https://doi.org/10.15640/jibf.v4n1a6
Nafti, O., Boumediene, S. L., Khouaja, S., & Ben Ayed, W. (2017). The Determinants of World Islamic Banks Efficiency: Empirical analysis Using a Non Parametric Approach. *Journal of Applied Business Research*, *33*(2), 363–374. https://doi.org/10.19030/jabr.v33i2.9910
Noor, M. A. N. M., & Ahmad, N. H. B. (2012). The Determinants of Islamic Banks' Efficiency Changes: Empirical Evidence from the World Banking Sectors. *Global Business Review*, *13*(2), 179–200. https://doi.org/10.1177/097215091201300201
Nurfalah, I., Rusydiana, A. S., Laila, N., & Cahyono, E. F. (2018). Early warning to banking crises in the dual financial system in Indonesia: The markov switching approach. *Journal of King Abdulaziz University: Islamic Econ.*, *31*(2), 133-156.
Omar, M. A., Rahman, A. R. A., Yusof, R. M., Shabri, M., & Rasid, M. E. S. M. (2006). Efficiency of commercial banks in Malaysia. *Asian Academy of Management Journal of Accounting and Finance*, *2*(2), 19–42.
Onour, I. A., & Abdalla, A. M. . (2011). Scale and Technical Efficiency of Islamc Banks in Sudan : Data Envelopment Analysis. *MPRA Paper*, (29885), 2–20.
Panah, H. G. Y., Ahmadanuar, M., & Norhan, N. I. (2014). Inputs and Outputs in Islamic Banking System. *Iranian Journal of Management Studies*, *7*(1), 175–188.

https://doi.org/10.22059/ijms.2014.36207
Pehlivan, D. P. (2015). Scrutinising Efficiencies of Participation Banks: Turkey Sample 2005-2013. *Journal of Finance and Bank Management*, *3*(1), 47–55. https://doi.org/10.15640/jfbm.v3n1a5
Piliang, E., Ritha, H., & Hadiyati, P. (2010). Technical and Scale Efficiency of Syariah Banking in Indonesia : Data Envelopment Analysis Approach. *Journal of Economics, Business & Accountancy Ventura*, *13*(1), 27–38.
Pradiknas, T. Y., & Faturohman, T. (2015). Efficiency of Islamic Banking Compared To Conventional Banking: Eveidence From Indoensian Banking Sector. *Journal of Business and Management*, *4*(5), 540–551.
Pramuka, B. A. (2011). Assessing Profit Efficiency of Islamic Banks in Indonesia: an Intermediation Approach. *Journal of Economics, Business, and Accountancy | Ventura*, *14*(1), 79–88. https://doi.org/10.14414/jebav.v14i1.21
Prasetyia, F., & Diendtara, K. (2011). Pengukuran Efisiensi Perbankan Syariah Berbasis Manajemen Risiko. *Jurnal Keuangan Dan Perbankan*, *15*(1), 119–129.
Qayyum, A., & Riaz, K. (2012). Technical Efficiency of Pakistani Banks: An Application of Bootstrapped Data Envelopment Analysis Approach. *World Applied Sciences Journal*, *16*(12), 1837–1845.
Qureshi, M. A., & Shaikh, M. (2012). Efficiency of Islamic and Conventional Banks in Pakistan: A Non-parametric Approach. *International Journal of Business and Management*, *7*(7), 40–50. https://doi.org/10.5539/ijbm.v7n7p40
Rahim, A., Rahman, A., & Rosman, R. (2013). Efficiency of Islamic banks: A comparative analysis of MENA and Asian countries. *Journal of Economic Cooperation and Development*, *34*(1), 63–92.
Rahim, R. A. (2016). Does competition foster efficiency? Empirical evidence from Malaysian commercial banks. *Asian Academy of Management Journal of Accounting and Finance*, *12*(1), 1–23.
Rahim, S. R. M., Bakar, J. binti A., & a/p Ganapathy, T. (2015). How Efficient Are Islamic Banks in Malaysia? *Journal of Business Studies Quarterly*, *6*(3), 164–174. Retrieved from https://search.proquest.com/docview/1667167788?accountid=17242
Rahman, M. M. (2011). Non-Parametric Approach To Model the Branch-Wise Efficiency of Islami Bank Bangladesh Limited (Ibbl): an Empirical Study. *International Journal of Economics, Management and Accounting*, *19*(2), 137–168.
Rahmawati, R. (2015). Strategi Peningkatan Efisiensi Biaya pada Bank Umum Syariah Berbasis Stochastic Frontier Approach dan Data Envelopment Analysis. *Buletin Ekonomi Moneter Dan Perbankan*, *17*(4), 457–480. https://doi.org/10.21098/bemp.v17i4.506
Ramly, A. R., & Hakim, A. (2017). Pemodelan Efisiensi Bank di Indonesia: Perbandingan antara Bank Syariah dan Bank Konvensional. *Esensi: Jurnal Bisnis Dan Manajemen*, *7*(2), 131–148. https://doi.org/10.15408/ess.v7i2.4989
Ratnam, C. S. V. (2010). X-efficiency analysis of Pakistani commercial banks. *International Management Review*, *6*(1), 35–50. Retrieved from http://193.60.48.5/docview/816379154?accountid=15997 LA - English
Rodoni, A., Salim, M. A., Amalia, E., & Rakhmadi, R. S. (2017). Comparing Efficiency and Productivity in Islamic Banking : Case Study Indonesia, Malaysia and Pakistan. *Al-Iqtishad: Journal of Islamic Economics*, *9*(2), 227–242. https://doi.org/10.15408/aiq.v9i2.5153
Rusydiana, A. S. (2021). Bibliometric analysis of journals, authors, and topics related to covid-19 and Islamic finance listed in the dimensions database by biblioshiny. *Science Editing*,

8(1), 1-7.
Rusydiana, A. S. (2018a). Efisiensi Dan Stabilitas Bank Umum Syariah Di Indonesia. *Akuntabilitas : Jurnal Ilmu Akuntansi*, *11*(2), 203–222. https://doi.org/10.15408/akt.v11i2.7033
Rusydiana, A. S. (2018b). Indeks Malmquist untuk Pengukuran Efisiensi dan Produktivitas Bank Syariah di Indonesia. *Jurnal Ekonomi Pembangunan*, *26*(1), 47–58. https://doi.org/10.14203/jep.26.1.2018.47-58
Rusydiana, A. S., & Firmansyah, I. (2018). Efficiency versus Maqashid Sharia Index: an Application on Indonesian Islamic Bank. *Shirkah: Journal of Economics and Business*, *2*(2), 139–166. https://doi.org/10.22515/shirkah.v2i2.154
Rusydiana, A. S., Laila, N., & Sudana. (2019). Efisiensi dan produktivitas industri perbankan pada sistem moneter ganda di Indonesia. *Jurnal Siasat Bisnis*, *23*(1), 50–66. https://doi.org/10.20885/jsb.vol23.iss1.art5
Rusydiana, A. S., & Sanrego, Y. D. (2018). Measuring the Performance of Islamic Banking in Indonesia : An Application of Maslahah-Efficiency Quadrant (MEQ). *Journal of Islamic Monetary Economics and Finance*, *3*, 103–130.
Rusydiana, A. S., Tanjung, H., & Marlina, L. (2018). Maslahah Based Measurement on Indonesia Islamic Banks. *International Journal of Islamic Business Ethics*, *3*(1), 365. https://doi.org/10.30659/ijibe.3.1.365-382
Rusydiana, A. S., Laila, N., Tubastuvi, N., Ibrahim, M. A., & Marlina, L. (2021). Energy Efficiency in OIC Countries: SDG 7 Output. *International Journal of Energy Economics and Policy*, *11*(1), 74-81.
Rusydiana, A., Taqi, M., Firmansyah, I., Assalafiyah, A., & Kustiningsih, N. (2020). A Bibliometric Analysis of Islamic Accounting Research Indexed by Dimensions. ai. *Library Philosophy and Practice (ejournal)*, 4803.
Sabirzyanov, R., & Abduh, M. (2016). Comparasion of Efficiency in Conventional and Islamic Banks Using Data Envelopment Analysis (DEA). *Journal Islamic Banking and Finance*, *33*(3), 84–95.
Saeed, S., Ali, F., Adeeb, B., & Hamid, M. (2013). Examining Efficiency of Islamic and Conventional Banks in Pakistan: Using Data Envelopment Analysis. *Global Journal of Management and Business Research Finance*, *13*(10), 25–34.
Said, A. (2012). Efficiency in Islamic Banking during a Financial Crisis-an Empirical Analysis of Forty-Seven Banks. *Journal of Applied Finance & Banking*, *2*(3), 163–197. Retrieved from http://ssrn.com/abstract=2084626Electroniccopyavailableat:http://ssrn.com/abstract=2084626http://ssrn.com/abstract=2084626Electroniccopyavailableat:http://ssrn.com/abstract=2084626
Said, A. (2013). Evaluating the overall technical efficiency of islamic banks operating in the MENA region during the financial crisis. *International Journal of Economics and Financial Issues*, *3*(2), 426–434.
Said, A. (2016). The Influence of Oil Prices on Islamic Banking Efficiency Scores during the Financial Crisis: Evidence from the MENA Area. *International Journal of Finance & Banking Studies*, *4*(3), 35–43. https://doi.org/10.20525/.v4i3.223
Sakti, M. R. P., & Mohamad, A. (2018). Efficiency, stability and asset quality of Islamic vis-à-vis conventional banks: Evidence from Indonesia. *Journal of Islamic Accounting and Business Research*, *9*(3), 378–400. https://doi.org/10.1108/JIABR-07-2015-0031
Sallam, S. (2018). PRODUCTIVITY AND TECHNICAL EFFICIENCY IN ISLAMIC BANKS : CROSS - COUNTRY ANALYSIS. *Asian Journal of Economic Modelling*, *6*(1), 1–7.

https://doi.org/10.18488/journal.8.2018.61.1.8

Samad, A. (2018). Did Global Financial Crisis Impact the Islamic Banking Efficiencies? Evidence from Malaysian Islamic Banks. *Global Review of Islamic Economics and Business*, *6*(2), 75–90.

Samad, A. (2019). Determinants of Commercial Bank Efficiency? Evidence from Bangladesh. *Journal of Business Diversity*, *19*(3), 119–136. https://doi.org/10.33423/jbd.v19i3.2218

San, O. T., Theng, L. Y., & Heng, T. B. (2011). A comparison on efficiency of domestic and foreign banks in Malaysia : A DEA approach. *Business Management Dynamics*, *1*(4), 33–49.

Sardar, A., Azeem, M. M., Ahmed, T., & Zafar, S. (2011). Islamic Banks: Efficiency and its Determinants in Pakistan. *Islamic Studies*, *50*(3/4), 423–434. Retrieved from http://www.jstor.org/stable/41932605%0Ahttp://files/237/2011 - Islamic Banks Efficiency and its Determinants in .pdf

Sarifudin, M., & Faturohman, T. (2017). Spin-Off Efficiency Analysis of Indonesian Islamic Banks. *Journal of Business and Management*, *6*(2), 192–202.

Setiawan, C., & Bagaskara, B. (2016). Non-Performing Financing (NPF) and Cost Efficiency of Islamic Banks in Indonesia Period 2012Q1 to 2015Q2. *Journal of Emerging Issues in Economic, Finance, and Banking (JEIEFB)*, *5*(1), 1–13. https://doi.org/10.1016/j.atmosenv.2018.09.034

Setiawan, C., & Sherwin, S. M. (2017). Banks Efficiency and the Determinants of Non-Performing Financing of Full-Fledged Islamic Banks in Indonesia. *Proceeding of 12th Asia-Pacific Business Research Conference*, 1–13. https://doi.org/10.1051/jp3:1991231

Shafitranata, & Hosen, M. N. (2014). Efficiency of Islamic Banks Using Data Envelopment Analysis (DEA) in Indonesia, 2007-2010. *International Journal of Academic Research in Economics and Management Sciences*, *3*(1), 223–235. https://doi.org/10.6007/ijarems/v3-i1/619

Shah, I. A., Shah, S. Z. A., & Ahmad, H. (2012). Comparing the efficiency of Islamic versus conventional banking: through data envelopment analysis (DEA) model. *African Journal of Business Management*, *6*(3), 787–798. https://doi.org/10.5897/ajbm11.575

Shahid, H., ur Rehman, R., Niazi, G. S. K., & Raoof, A. (2010). Efficiencies comparison of Islamic and conventional banks of Pakistan. *International Research Journal of Finance and Economics*, (49), 24–44.

Shahsuzan, Z., Izah, M. T., & Memariani, A. (2012). A proposed Islamic banking efficiency framework : A Fuzzy Data Envelopment Analysis (FDEA) investigation. *Finance Management*, *48*, 9319–9324.

Shahwan, T. M., & Hassan, Y. M. (2013). Efficiency analysis of UAE banks using data envelopment analysis. *Journal of Economic and Administrative Sciences*, *29*(1), 4–20. https://doi.org/10.1108/10264111311319204

Shamshur, A., & Weill, L. (2019). Does bank efficiency influence the cost of credit?. *Journal of Banking & Finance*, *105*, 62-73.

Sharma, D., Sharma, A. K., & Barua, M. K. (2013). Efficiency and productivity of banking sector. *Qualitative Research in Financial Markets*.

Shawtari, F. A., Abdelnabi Salem, M., & Bakhit, I. (2018). Decomposition of efficiency using DEA window analysis: A comparative evidence from Islamic and conventional banks. *Benchmarking An International Journal*, *25*(6), 1681–1705. https://doi.org/10.1108/BIJ-12-2016-0183

Shawtari, F. A., Ariff, M., & Abdul Razak, S. H. (2019). Efficiency and bank margins: a comparative analysis of Islamic and conventional banks in Yemen. *Journal of Islamic*

Accounting and Business Research, *10*(1), 50–72. https://doi.org/10.1108/JIABR-07-2015-0033

Siddique, M. A., & Rahim, M. (2013). Efficiency Analysis Islamic Banks and Standalone Islamic Branches of Conventional Banks in Pakistan : A Comparative Study for Period of 2007-2012. *Journal of Islamic Business and Management*, *3*(2), 129–149.

Sillah, B. M. S., & Harrathi, N. (2015). Bank Efficiency Analysis: Islamic Banks versus Conventional Banks in the Gulf Cooperation Council Countries 2006 - 2012. *International Journal of Financial Research*, *6*(4), 143–150. https://doi.org/10.5430/ijfr.v6n4p143

Srairi, S., & Kouki, I. (2012). Efficiency and Stock Market Performance of Islamic Banks in GCC countries. *ISRA International Journal of Islamic Finance*, *4*(2), 89–116. https://doi.org/10.2307/j.ctt1df4hbd.9

Sufian, F. (2006a). Size and Returns To Scale of the Islamic Banking Industry in Malaysia: Foreign Versus Domestic Banks. *IIUM Journal of Economics and Management*, *14*(2), 147–175.

Sufian, F. (2006b). The Efficiency of Islamic Banking Industry: a Non-Parametric Analysis With Non-Discretionary Input Variable. *Islamic Economic Studies*, *14*(1), 53–87.

Sufian, F. (2006c). The efficiency of Islamic banking industry in Malaysia: Foreign vs Domestic Banks. *Review of Islamic Economics*, *10*(2), 27–53. https://doi.org/10.1108/08288660710779399

Sufian, F. (2007a). Malmquist Indices of productivity Change in Malaysian Islamic Banking Industry: Foreign Versus Domestic Banks. *Journal of Economic Cooperation*, *28*(1), 115–150. https://doi.org/10.1007/BF02294970

Sufian, F. (2007b). Total Factor Productivity Change of the Malaysian Islamic Banking Sector : An Empirical Study. *Journal of Islamic Economics, Banking and Finance*, *5*(1), 73–88. https://doi.org/10.1016/S0148-6195(97)10076-5

Sufian, F. (2009). Sources of TFP growth in the Malaysian Islamic banking sector. *Service Industries Journal*, *29*(9), 1273–1291. https://doi.org/10.1080/02642060801911128

Sufian, F. (2010). Productivity, technology and efficiency of de Novo Islamic banks: Empirical evidence from Malaysia. *Journal of Financial Services Marketing*, *15*(3), 241–258. https://doi.org/10.1057/fsm.2010.20

Sufian, F., & AbdulMajid, M.-Z. (2008). Bank Ownership, Characteristics, and Performance:A Comparative Analysis of Domestic and Foreign Islamic Banks in Malaysia. *Journal of King Abdulaziz University-Islamic Economics*, *21*(2), 3–36. https://doi.org/10.4197/islec.21-2.1

Sufian, F., & Noor, M.A.N.M. (2009). The determinants of Islamic banks' efficiency changes: Empirical evidence from the MENA and Asian banking sectors. *International Journal of Islamic and Middle Eastern Finance and Management*, *2*(2), 120–138. https://doi.org/10.1108/17538390910965149

Sufian, F., & Habibullah, M. S. (2010). Does foreign presence foster Islamic banks' performance? Empirical evidence from Malaysia. *Inzinerine Ekonomika-Engineering Economics*, *21*(5), 464–474. https://doi.org/10.1108/17590811011086723

Sufian, F., & Habibullah, M. S. (2012). Globalisation and bank efficiency nexus: Symbiosis or parasites? *Review of Development Finance*, *2*(3–4), 139–155. https://doi.org/10.1016/j.rdf.2012.09.003

Sufian, F., & Haron, R. (2008). The sources and determinants of productivity growth in the Malaysian Islamic banking sector: a nonstochastic frontier approach. *International Journal of Accounting and Finance*, *1*(2), 193–215. https://doi.org/10.1504/ijaf.2008.020303

Sufian, F., Kamarudin, F., & Mohd Noor, N. H. H. (2014). Revenue efficiency and returns to

scale in Islamic banks: Empirical evidence from Malaysia. *Journal of Economic Cooperation and Development*, *35*(1), 47–79.

Sufian, F., Kamarudin, F., & Nassir, A. md. (2016). Determinants of efficiency in the malaysian banking sector: Does bank origins matter? *Intellectual Economics*, *10*, 38–54. https://doi.org/10.1016/j.intele.2016.04.002

Sufian, F., Kamarudin, F., & Noor, N. H. H. M. (2012). Determinants of revenue efficiency in the Malaysian Islamic banking sector. *Journal of King Abdulaziz University, Islamic Economics*, *25*(2), 195–224. https://doi.org/10.4197/Islec.25-2.7

Sufian, F., Noor, M. A. M., & Majid, M. Z. A. (2008). The efficiency of Islamic banks: empirical evidence from the MENA and Asian Countries Islamic Banking Sectors. *The Middle East Business and Economic Review*, *20*(1), 2–19. https://doi.org/10.1504/jibed.2010.036999

Tahir, Izah Moh, Razali, A., & Haron, S. (2013). Analysing Islamic Bank Efficiency in Malaysia Using the Standard and Alternative Approaches to Data Envelopment Analysis. *Journal of Economics and Behavioral Studies*, *5*(11), 798–804.

Tahir, Izah Mohd, Bakar, N. M. A., & Haron, S. (2011). Evaluating Efficiency of Islamic Banks Using Data Envelopment Analysis : International Evidence. *Journal of Economics, Banking and Finance*, *7*(1), 11–15.

Tai, L. (2014). Efficiency and Performance of Conventional and Islamic Banks in GCC Countries. *Middle East Journal of Business*, *9*(2), 60–71. https://doi.org/10.5742/mejb.2014.92387

Tajgardoon, G., Behname, M., & Noormohamadi, K. (2012). Is profitability as a result of Market Power or Efficiency in Islamic Banking Industry? *Economics and Finance Review*, *2*(5), 1–7.

Van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *scientometrics*, *84*(2), 523-538.

Van Eck, N. J., & Waltman, L. (2007). Bibliometric mapping of the computational intelligence field. *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, *15*(05), 625-645.

Van Eck, N. J., Waltman, L., Dekker, R., & van den Berg, J. (2010). A comparison of two techniques for bibliometric mapping: Multidimensional scaling and VOS. *Journal of the American Society for Information Science and Technology*, *61*(12), 2405-2416.

Wafik, D., & Tharwat, A. (2015). Investigating Economical Performance for UAE Islamic Banks versus Commercial Banks. *International Journal of Interdisciplinary Research and Innovations*, *3*(3), 61–71.

Wahab, A. H. A., & Haron, R. (2017). Efficiency of Qatari banking industry: an empirical investigation. *International Journal of Bank Marketing*, *35*(2), 298–318. https://doi.org/10.1108/IJBM-07-2016-0090

Wahab, A., Hosen, M. N., & Muhari, S. (2014). Komparasi Efisiensi Teknis Bank Umum Konvensional (BUK) dan Bank Umum Syariah (BUS) di Indonesia Dengan Metode Data Envelopment Analysis (DEA). *Al-Iqtishad: Jurnal Ilmu Ekonomi Syariah*, *6*(2), 179–194. https://doi.org/10.15408/aiq.v6i2.1229

Wahid, M. A. (2016). Comparing The Efficiency Of Islamic And Conventional Banks Based On The Evidence From Malaysia. *Journal of Muamalat and Islamic Finance Research*, *13*(1), 36–99.

Wanke, P., Azad, M. A. K., & Barros, C. P. (2016). Financial distress and the Malaysian dual baking system: A dynamic slacks approach. *Journal of Banking and Finance*, *66*, 1–18. https://doi.org/10.1016/j.jbankfin.2016.01.006

Wanke, P., Azad, M. A. K., Emrouznejad, A., & Antunes, J. (2019). A dynamic network DEA model for accounting and financial indicators: A case of efficiency in MENA banking. *International Review of Economics and Finance*, *61*, 52–68. https://doi.org/10.1016/j.iref.2019.01.004

Warninda, T. D., & Hosen, M. N. (2015). Mapping and Correlation Analysis of Efficiency and Profitability: The Case of Islamic Rural Bank in Indonesia. *Al-Iqtishad: Jurnal Ilmu Ekonomi Syariah*, *7*(1), 1–12. https://doi.org/10.15408/aiq.v7i1.1354

Warraich, K., & Dost, M. K. Bin. (2013). Scale efficiency of Islamic banks of Pakistan. *African Journal of Business Management*, *7*(23), 2249–2256. https://doi.org/10.5897/AJBM11.1255

Yahya, M. H., Muhammad, J., & Hadi, A. R. A. (2012). A comparative study on the level of efficiency between Islamic and conventional banking systems in Malaysia. *International Journal of Islamic and Middle Eastern Finance and Management*, *5*(1), 48–62. https://doi.org/10.1108/17538391211216820

Yaumidin, U. K. (2007). Efficiency in Islamic Banking: a Non-Parametric Approach. *Buletin Ekonomi Moneter Dan Perbankan*, *9*(4), 23–54. https://doi.org/10.21098/bemp.v9i4.213

Yildirim, I. (2015). Financial efficiency analysis in Islamic banks: Turkey and Malaysia Models. *Journal of Economics, Finance and Accounting*, *2*(3), 289–289. https://doi.org/10.17261/pressacademia.2015312956

Yudistira, D. (2004). Efficiency in Islamic Banking: an Empirical Analysis of Eighteen Banks. *Islamic Economic Studies*, *12–1*(1), 2–19.

Yüksel, S., Mukhtarov, S., & Mammadov, E. (2016). Comparing the efficiency of Turkish and Azerbaijani banks: An application with data envelopment analysis. *International Journal of Economics and Financial Issues*, *6*(3), 1059–1067.

Yulita, I., & Rizal, S. (2016). Islamic Banking Efficiency: Comparative Studies Between Malaysia and Indonesia. *Signifikan: Jurnal Ilmu Ekonomi*, *5*(1), 31–50. https://doi.org/10.15408/sjie.v5i1.3129

Zakaria, Z., & Purhanudin, N. (2017). Bank Risks and Total Productivity Changes in Malaysian Banks. *International Journal of Business Management and Economic Research (IJBMER)*, *8*(2), 894–901.

Zeitun, R., & Benjelloun, H. (2012). The Efficiency of Banks and the Financial Crisis in a Developing Economy: The Case of Jordan. *International Review of Accounting, Banking and Finance*, *4*(2), 28–60.

Zeitun, R., & Benjelloun, H. (2013). The Efficiency of Banks and the Financial Crisis in a Developing Economy : The Case of Jordan. *Journal of Finance, Accounting and Management*, *4*(1), 1–20.