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A Conceptual Framework of The Impact of Arabic Spring on Efficiency, Intellectual Capital, And Corporate Governance of Islamic Banks

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Abstract

This is a concept paper for a future study based on the literature on risk management, intellectual capital, corporate governance, and efficiency measurement of banks in Arab countries. The importance of efficiency research in the banking sector has increased over the years as all banks strive to be efficient by minimizing inputs such as costs and maximizing outputs such as profit. The aim of this study is to compare banking efficiency between conventional and Islamic banks in several Arab countries (Tunisia, Jordan, Egypt, and Lebanon) that experienced both economic and political downturns during the Arab Spring. Data Envelopment Analysis (DEA) is used to study bank efficiency. Analysis DEA can help banks become more efficient while maximizing their knowledge benefits. Future studies could provide advice to banks on how to increase their efficiency. In addition, the empirical results of this study will contribute to the existing literature on bank efficiency in Arab countries.

Keywords: banking efficiency; Islamic banks; conventional banks; risk management; intellectual capital; corporate governance

1. Introduction

The banking sector forms the backbone of the financial systems of most industrialised countries. Studies of the efficiency of financial institutions have become a major aspect of banking research since the 1990s because of their impact on organisational performance (Berger & Humphrey, 1997b). Given the importance of banking efficiency, it is crucial to understand how it can be measured in the banking sector (Chortareas, Girardone, & Ventouri, 2012). Measuring efficiency would allow banks to determine their current level of efficiency and see how they compare to other banks. Historically, Islamic banking began as a financial system in Iran and Pakistan in the 1970s; However, the first Islamic bank was the Dubai Islamic Bank (DIB) in the United Arab Emirates, followed by the establishment of the International Islamic Development Bank (IDB) in Jeddah, Saudi Arabia. Islamic banks differ from non-Islamic banks in that they provide sound financial services and play an important role in developing the economies of their societies. The first Islamic banking system was opened in Egypt in 1963, when the first Islamic bank was opened; thereafter, the sector began to develop rapidly (Al-Khasawneh, Bassedat, Aktan, & Darshini Pun Thapa, 2012). Today, there are over 3,000 Islamic banking institutions worldwide, spread across 70 countries. Most of them have established themselves in the Middle East and Southeast Asia, with Bahrain and Malaysia as centres. In addition, Islamic banks are also clearly visible in Europe and the U.S (Haddad, Sbeiti, & Qasim, 2017).

2. Systematic Overview of Banking Efficiency

Most of the literature on bank efficiency comes from the United States. In contrast, there is little literature on banks in Europe and the Arab world (Chortareas et al., 2012; Du, Worthington, & Zelenyuk, 2018; Hajer & Anis, 2018; Olson & Zoubi, 2011; Vu & Nahm, 2013). To measure efficiency, the systematic approach shown in Figure 1 is followed in the literature.

Figure 1 shows the systematic approach to measuring efficiency, which consists of four main steps, each of which shows the process for measuring bank efficiency. First, the type of efficiency is determined, which includes: a) technical efficiency (Farrell, 1957) , which refers to a service provider (i.e., the bank) creating a separate output for the lowest possible price in order to be cost-efficient. Similarly, a service provider seeks revenue efficiency and maximizes income from the use of given inputs (e.g.,

capital, fixed assets, and deposits); and b) allocative efficiency (Farrell, 1957; Leibenstein, 1966), which refers to the process of maximizing profits from the assigned inputs and outputs (e.g., loan and investment) (i.e., profit efficiency).

Second, the service provider chooses approaches to measure efficiency: a) parametric approach such as the Stochastic Frontier Approach (SFA),(Aigner, Lovell, & Schmidt, 1977) The Thick Frontier Approach (TFA) (Berger & Humphrey, 1997a), and the Distribution Free Approach (DFA) (Berger, Hunter, & Timme, 1993)), which uses econometric techniques; and b) nonparametric approaches such as Free Disposal Hull analysis (Deprins, Simar, & Tulkens, 1984) and Data Envelopment Analysis (DEA) ,(Charnes, Cooper, & Rhodes, 1978). which uses linear programming methods. The main differences between the two approaches are the handling of random errors and the assumptions about the geometry of the efficiency frontier. Each approach has its advantages and disadvantages.Each approach has its advantages and disadvantages. Financial institution efficiency studies employ non-parametric or parametric approaches since both approaches employ quite different techniques for efficiency analysis. Apart from the research by (Casu & Girardone, 2002) , there is no evidence of consistency between the two approaches because only a few experiments have been conducted to test the robustness of the data . To support the results, parametric and non-parametric methods should be used (Abbas, Hammad, Elshahat, Azid, & Authors, 2015; Abdul-Majid, Saal, & Battisti, 2010; Hassan, Mohamad, & Khaled I. Bader, 2009). If the bulk of the findings from the two methodologies are similar, one can be confident that the results are not the result of chance or luck.

Third, the input and output variables must be identified after deciding on efficiency and measurement methods. In particular, Figure 1 illustrates the decision a service provider must make before measuring bank efficiency. However, any decision that is made is based primarily on how banks manage the money they receive from depositors and the money they extend to creditors. In this regard, there are two basic approaches: a) The intermediation approach, which is based on the intermediation concept, is proposed by (Lindley & Sealey, 1977) and defines banks as financial intermediaries (or fund collectors) that act as intermediaries between surplus agents and deficit makers through loans and other types of resource transfer. The intermediation approach is commonly used to specify the variables that are used as inputs and outputs (Liu, Lu, Lu, & Lin, 2013) . In this approach, the different types of resources that can be lent and the costs associated with executing the intermediation process are used as inputs, while the different types of cash that can be provided are used as outputs (Cook, Zhu, Bi, & Yang, 2010) ; and b) the production approach (Cobb &

Douglass, 1928) , in which banks use physical inputs such as labour and capital to establish deposit and loan accounts, the production method defines banking activity as the production of services.

Finally, after following all the above procedures, a service provider can obtain efficiency results (see Figure 1). Inefficiency is measured by the spread between the value of one and the observed value. A value of one, or one hundred percent, indicates maximum efficiency and frontier operations. Operations below the frontier have a value of less than one or 100%.

This paper attempts to compare the efficiency between Islamic and conventional banks by using different variables such as risk management, intellectual capital, and corporate governance as moderators of the relationship between the two variables and bank efficiency (DEA). The financial crisis affected many conventional banks around the world, but Islamic banks were not affected by it (Kweh, Lu, Nourani, & Ghazali Mohd Zain, 2018; Selvanathan, Nadarajan, Zamri, Suppramaniam, & Muhammad, 2018). The reason is that Islamic banks follow Sharia principles that prohibit interest, which is detrimental to conventional banks. Islamic banks are also spreading outside traditional Muslim regions. Today, there are over 3000 Islamic banking institutions in 70 countries worldwide, most of which are located in the Middle East and Southeast Asia, with Bahrain and Malaysia being the most important centres. In addition, there is a significant emergence of Islamic banks in Europe and the US (Al-Hares & Saleem, 2017) .Due to the rapid rise of Islamic banking and its importance to some sectors of the economy in MENA, CGG, and East Asian countries, there is a need to understand its efficiency and drivers.

The current study focuses on four Arab countries, namely Tunisia, Jordan, Egypt and Lebanon, with a substantial Muslim populations and where Islamic and conventional banks operate. The objective of this study is to compare the performance of banks in comparison between Islamic and conventional banking systems. Since Islamic banks do not engage in activities that are not permitted by Islam, even if they might promise a high return, compliance.

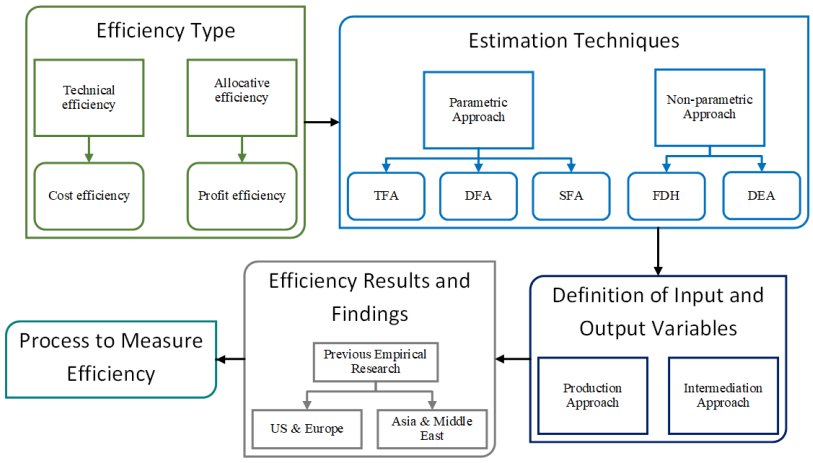

Figure 1. Systematic approach For measuring banking efficiency.

3. Literature review

The world economy is facing severe global financial challenges that have caused the failure of several banks. This failure was caused by the global financial crisis that began in 2008 and ended in 2010 and the Arab revolutions known as the Arab Spring that took place in 2011(Mondal & Ghosh, 2012a). The results of the studies on banking efficiency have shown contradictory results, in which some studies have shown a positive impact and some studies in the Arab region have shown a negative impact of banking efficiency among Islamic and conventional banks. (Abedifar, Ebrahim, Molyneux, & Tarazi, 2015a; Jamaluddin & Ilyas, 2017; Shawtari, Arrif, & Abdul Razak, 2015) .

Efficient and effective use of resources is a significant objective for each bank. Poor use of resources or inefficacy has always been a persisting issue in Islamic and conventional banking; however various ongoing efforts are expediting that relate to banking efficiency. For instance, increasing competition for Risk management, corporate governance,and intellectual capital is used to control banks' expenses and efficiently administer resources There are many studies on corporate governance, but few studies focus on the corporate governance of banks (Abedifar et al., 2015a) although the critical parts of corporate governance can be related to banks. The issues of aggregate activity considered by shareholders who want to guarantee the adequate allotment of assets and circulation of semirents, as well as the issues arising from different types of ownership and control, are significant financial elements. A bank's

CEO should therefore concentrate the bank's monetary help in the areas where it is most effective and not simply withdraw from the energetic connection he values with middle-income countries. Previous studies show conflicting results on the relationship between risk management and efficiency. The studies of (Danoshana & Ravivathani, 2019; García-Meca & Śnchez-Ballesta, 2010) show a positive relationship between risk management and efficiency. It prevents management from misusing organizational funds, protects shareholders' rights, and increases performance levels by minimizing risk management related to financial and administrative corruption at the organizational level.

Enthusiasm for intellectual capital drastically developed dramatically as various information-based escalated businesses showed up, e.g., programming development, biotechnology, consulting, computers, and web-based ventures.(Dženopoljac, Janoševic, & Bontis, 2016) tended to understand intellectual capital broadly as the totality of learning, data, protected innovation, and experience possessed by everyone in an organisation and utilised to create an aggressive edge and consequently the wealth of an organisation. Subsequently, numerous benefactors endeavoured to refine, refresh, and further explore the intellectual capital of organisations (Dženopoljac et al., 2016). Learning the board and intellectual capital are considered among the most recent management control tools that have been recognised by established researchers. Therefore, it is important to investigate this factor in the banking system in the Arabian world.

Efficiency is a critical factor in remaining competitive, and various later factual investigations have shown that efficient banks have significant cost and competitive advantages over banks with average or below-average efficiency. Different methodological approaches have been utilized to determine this efficiency estimation issue.Most studies use parametric (Gheeraert & Weill, 2015) or non-parametric frontier approaches (Johnes, Izzeldin, & Pappas, 2014) However, the majority of researchers suggest the use of non-parametric approaches, and thus this study will focus on DEA (Aye, Gupta, & Wanke, 2018; Emrouznejad & Yang, 2018). Nevertheless, (Titus, Vamosiu, & McClure, 2017), used two parametric methods, SFA and multiple regression analysis (MRA), to measure efficiency.

The aim of this study is to investigate the factors that influence the Arabian banking system, because the Arabian world has a unique background and allows for different outcomes with each factor. This examination looks to cover the Islamic and conventional banks from four countries, namely Tunisia, Jordan, Egypt and Lebanon, before the Arab Spring (2008-2010) and after the Arab Spring (2011-2019), due to the ongoing changes in the Arab world are diverse and complex and cannot be clearly

attributed to a single factor. In this way, this study provides a comprehensive understanding of the financial peaks of the Arab world. It unites an across-the-board connected and scholastic writing on the monetary scenes of the Arab world and looks at present day advancements affecting bank arrangement and execution of banks. These trends suggest that cost control can be an essential objective of bankers and that utilizing resources efficiently and effectively will be critical to the success of banks. This study depends on numerous research questions on the impact of corporate governance, intellectual capital and risk management in the banking system using DEA in the Arab world. This study identifies several characteristics of the most efficient and least efficient banking systems using DEA in the Arab world. By comparing the financial characteristics, ownership and management of these two groups of banks, the research will attempt to uncover factors that contribute to efficient financial practises.This research aims to fill the gap in banking efficiency, with risk management, corporate governance and intellectual capital in banks being critical motivations for demonstrating this investigation in the Arab world. However, there are still not enough studies that address the efficiency of conventional and Islamic banks in the Arab countries due to the lack of evidence from the banking sector in the Arab countries (Han, Kim, & Kim, 2012; Rosman, Wahab, & Zainol, 2014).

3.1 Islamic Banking and The Effect of Arab Spring

The Arab Spring in the MENA countries is a regional populist revolution that has changed the political dynamics. It began in 2010 and has continued in one form or another, whether in the form of ongoing violent conflict or constant regime change due to an unpredictable citizenry. The public has taken to the streets, mainly non-violently, to demand an end to authoritarian rule and corruption. (Nawaz, 2013) stated noted that the financial crisis in the Arab world has led to an increased need and awareness for effective risk management strategies and structures in the banking system.

Banks are referred to as the basic building block of a financial system as they play a crucial role in the development of the economy. The banking system has been studied and analysed in the literature from various aspects (Banya & Biekpe, 2018; Simatele & Mishi, 2018). Banking efficiency is an intermediary in transferring funds from surplus units to deficit units. Moreover, the banking sector is crucial in capital allocation and impact on GDP (Fu, Lin, & Molyneux, 2018) . Therefore, banking efficiency is crucial and needs to be given more attention in the literature to enable the

promotion of financial systems. The concept of bank efficiency in banking institutions is similar to that of other economic institutions, especially in terms of optimal use of available resources. However, measuring the efficiency of banks is different from that of other economic institutions, as they are different financial activities and it is difficult to determine inputs and 188 outputs (Azizi, 2014).

Islamic finance is a financial method that follows the path of the Holy Quran path and does not maximise the return on financial assets. Compared to conventional banks, Islamic banks are administrators and guardians of customers' money, but the difference is that they share profits and losses with their depositors. The Islamic bank is a partner to its depositors and an entrepreneurial partner as a recipient of depositors' funds for effective direct investment, unlike a conventional bank which is merely a creditor and a fund owner. Adherence to the rules of Islamic ethics is a primary concern of the Islamic banking system. All activities within the Islamic financial system are governed by the Islamic ethical standards defined in the Shariah. (Nasser M, 2000) stated that Islamic banks must abide by a set of laws that follow the Holy Quran and meet the requirements of the Muslim community requirements by providing forms of financing that are Islamically acceptable. Fundamentally, the Islamic banking system can be described as a fair and free mechanism where fairness is the primary objective of the Islamic system. However, it also limits the rights of participants in the system. While participants are free to transact in Islam, this basic principle of independence does not mean unrestricted freedom of contract and is bound by certain norms such as riba and gharar.

3.2 Studies Concerning Efficiency

Researchers have used different approaches to measure banking efficiency.(Milhem & Istaiteyeh, 2015) measured efficiency using the traditional method, while (Sompolos & Mavri, 2018) measured efficiency using financial ratio analysis. (Tuškan & Stojanović, 2016) and (Berger & Humphrey, 1997b) categorized the parametric methods into three different groups, namely SFA, DFA, and TFA. Non-parametric design techniques can be described as techniques that consider the efficiency guidelines of the Decision-Making Units (DMUs) to produce efficiency measurements (Al-Shammari & Salimi, 2002) . This approach considers the degree to which the overall performance of financial institutions can be influenced and the rate of DMU quality scores. Evaluation of measurements obtained from DMUs for this efficiency calculation shall be specified as efficient units. As a result, it is characterized by different structured outputs and specified inputs.(Jreisat, Hassan, & Shankar, 2018) acquired and analyzed the revenue performance of Islamic banks in

South East Asian countries. The level of revenue efficiency was calculated using the DEA method. It has been reported that domestic Islamic banks now generate higher revenues than international Islamic banks. As presented by (Avkiran, 2015) , the dynamic application DEA (DN-DEA) was seen in commercial banking with a focus on testing robustness. The study showed how successful benchmark outperformance techniques (DN-DEA) can be used in performance evaluation of banks. According to (Emrouznejad & Yang, 2018), this analysis shows a review covering the first 40 years of academic literature research on DEA. They listed the articles on DEA from 1978 to the end of 2016, including theories and methods, software improvements and actual applications in different scenarios. In addition, some overview statistics on the growth of publications, the most frequently used academic papers, authorship analysis and keyword analysis were provided.

According to (Kweh et al., 2018) both traditional and Islamic banks have made strides in improving their efficiency rates. However, their study revealed that Islamic banks had lower productivity compared to conventional banks. On the other hand, (Shawtari, Ariff, & Abdul Razak, 2015) presented conflicting results, suggesting that traditional banks are less effective than Islamic banks.

Nevertheless, (Acharya et al., 2018) argued that most previous studies found no significant gaps in effectiveness between Islamic and traditional banks. Several previous studies have shed light on this issue. (Jamaluddin & Ilyas, 2017) discovered that conventional banks place greater emphasis on technological efficiency. This highlights the importance of researchers, scholars, scientists, and academics in studying bank performance. To draw more conclusive findings regarding the success of Islamic and traditional banks in the Arab world, it is crucial to compare and contrast their performance. Multiple studies, including those conducted by (Azizi, 2014; Johnes et al., 2014; Kamarudin et al., 2018; Ramadilli Mohd, Hassan, & Bader, 2008) have produced similar results, finding no significant differences in efficiency between Islamic and conventional banks. In a survey titled "Efficiency of traditional vs Islamic banks: evidence from the Middle East," (Hassan et al., 2009) examined average cost, income, and profit scores of traditional and Islamic banks, as well as the impact of size and age on their performance. Their results indicated no significant disparities in the overall output of both types of banks. However, some studies have shown substantial variations in productivity between Islamic and traditional banks. (Milhem & Istaiteyeh, 2015), suggested that Islamic banks have become less competitive than commercial banks. In a study conducted between 2009 and 2013, the efficacy of Islamic and conventional banks in Jordan was examined. The findings revealed that

Islamic banks were less productive than their conventional counterparts. Furthermore, the primary factors contributing to efficiency disparities between Islamic and traditional banks were found to be significantly different, with only a few Islamic banks utilizing technologies similar to industry standards. Conventional banks were also found to be more risk-effective than Islamic banks.

Overall, the literature presents mixed findings regarding the efficiency of Islamic and traditional banks. While some studies indicate no significant differences, others highlight variations in productivity and the factors influencing it. Further research is needed to gain a comprehensive understanding of the performance of these banking systems.

3.3 Studies Concerning Risk Management

In a comparative study by (Kweh et al., 2018) which focused on the impact of risk management on banking performance, it was found that conventional banks exhibited greater efficiency than Islamic banks. The DNSBM model utilized in this study has the potential to be applied in other regions worldwide (khan, Amin, Khokhar, Hassan, & Ahmad, 2018).The study also highlighted the need for further research to determine the influence of functional Sharia advisory boards and governance on Islamic banks' efficiency and stability. However, previous research has produced conflicting findings, with some studies showing significant and positive results for Islamic banks (Amanat,Salman and Jalbani, 2008; Bashir & Azeez, 2022).while others have indicated negative results (Said, 2013) or emphasized the functional differences between Islamic and conventional banks in terms of efficiency. Therefore, this research aims to reconcile the conflicting findings from previous studies.

Risk management has garnered significant attention in recent decades. (Abu Hussain & Al-Ajmi, 2012) provided empirical evidence on risk management practices in Islamic and traditional banks in Bahrain. These banks demonstrated a strong understanding of risk and effective risk control measures, and the analysis revealed a positive and significant relationship between risk management strategies and the independent variables. It was also suggested that Islamic banks faced higher risks compared to traditional banks. In a study conducted by (Ben Selma Mokni, Echchabi, Azouzi, & Rachdi, 2015) on risk management approaches and techniques in Tunisian banks, a questionnaire was developed and validated using data from 16 selected banks. The findings highlighted the need for proper selection of methods to accurately measure credit risk exposures. Tunisian banks commonly employed strategies such as

guarantees and collateral to mitigate credit risks . (Mokni, Echchabi, & Rajhi, 2015) investigated risk management and its impact on bank performance in Islamic and traditional banks, revealing that an effective risk management system and risk reduction approach were employed in the banking sectors of the MENA region. Credit and liquidity risks were identified as the most significant risks associated with Islamic banks, and conventional risk reduction techniques were commonly used.

3.4 Studies Concerning Intellectual Capital

Numerous researchers have explored the value of intellectual capital, which is often regarded as a multidimensional concept encompassing intangible assets. Intellectual capital is linked to a firm's ability to develop, implement, and evaluate intangible resources to generate profit, thereby fostering the growth and success of the company's activities (Dean & Kretschmer, 2007) . It is considered an invaluable investment for individuals with expertise and abilities, as well as organizations' available or generated capabilities, facilitating a transition from a general category to a privileged category of support for organizational rejuvenation.

Empirical research on intellectual capital can be categorized into reporting and calculation of intellectual capital. A substantial amount of research in this field focuses on cross-sector analysis to assess the presence of intellectual capital within organizations. This is because intellectual capital coexists with other resources, such as physical and financial resources, and it is necessary to distinguish intellectual capital among these aspects. (Murthy & Mouritsen, 2011) conducted a cross-sectoral analysis of annual reports from corporations worldwide, examining trends in intellectual property protection by organizations.

3.5 Studies Concerning Corporate Governance

Corporate governance encompasses a set of rules, laws, and decisions that aim to optimize performance by selecting the best approaches to achieve desired goals (Panda & Leepsa, 2017) . It serves to prevent the misuse of company finances and protect shareholder rights. The implementation of Basel standards for value-added corporate governance has been found to be beneficial for the banking sector and plays a regulatory role in banks (Wijethunga & Ekanayake, 2015). Studies have shown that the impact of corporate governance as a moderator variable on bank performance may yield consistent results, although it can sometimes produce contradictory

findings. Despite this, there is a limited amount of research specifically focused on the corporate governance of banks(Abedifar, Ebrahim, Molyneux, & Tarazi, 2015b) . (Grassa & Matoussi, 2014) have suggested significant variations and disparities in the corporate governance system of Islamic banking in the GCC and Southeast Asian countries. However, (Wijethunga & Ekanayake, 2015) found in their analysis that there are both similarities and discrepancies in corporate governance between Islamic and traditional banks. (Ulussever, 2018) found that boards are highly involved in Islamic banks. Given the significant relationship between corporate governance and banks, various studies have explored the impact of governance on both Islamic and traditional banking sectors, focusing on their contrasting applications. However, the role of governance in the relationship between risk management or intellectual capital of Islamic and traditional banks has not been extensively discussed.

4. Proposed Conceptual Model

The research framework, as depicted in Figure 2, encompasses four main variables: risk management, intellectual capital, corporate governance, and bank efficiency. Risk management and intellectual capital serve as the independent variables, corporate governance acts as the moderating variable, and efficiency is the dependent variable. The study also considers bank size, bank age, and gross domestic product as control variables. Previous empirical literature in Islamic banking has primarily focused on competitiveness, efficiency, and risk control, either separately or in relation to commercial banks (Bitar, Pukthuanthong, & Walker, 2018). Various studies have examined credit effects and operational risks, highlighting the presence of adequate risk management mechanisms and effective risk strategies in the MENA banking sector. Both conventional and Islamic banks face significant threats related to credit and operational risks. Islamic banks often employ conventional credit risk reduction techniques extensively.

However, there have been limited studies exploring the relationship between intellectual capital and efficiency (Abdulsalam, Al-Qaheri, & Al-Khayyat, 2011; Mondal & Ghosh, 2012b) .For instance,(Ousama & Fatima, 2015) estimated the value-added intellectual coefficient (VAICTM) to evaluate the efficiency performance of Malaysia's Islamic banking sector and examined the relationship between intellectual capital efficiency and financial success. The purpose of this study is to investigate the moderating effect of corporate governance on the relationship between risk management and intellectual capital on efficiency. This research aims to contribute to the resolution of the ongoing debate in the corporate governance and

efficiency literature, particularly concerning the existence of a link between corporate governance variables such as board size, role duality, and board independence.

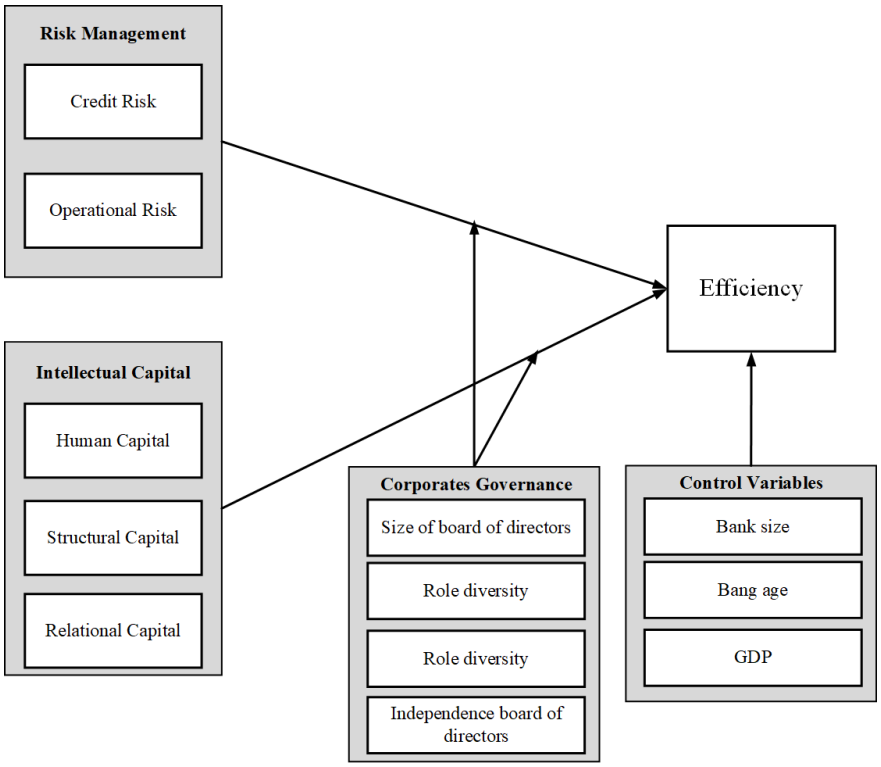

Figure 2. Conceptual Framework.

5. Conclusion and Future Research

The conceptual research presented in this paper aims to construct a comprehensive framework for measuring banking efficiency in conventional and Islamic banks across several Arab countries. These countries have undergone economic downturns and political changes associated with the Arab Spring. The objective is to contribute to the improvement of the struggling economy and enhance efficiency in the Arab world. For future studies, the proposed framework will be applied to the Islamic and conventional banking sectors in Jordan, Lebanon, Tunisia, and Egypt. The analysis will specifically focus on risk management and intellectual capital as independent variables, while corporate governance will act as a moderating variable. The data for the study, including annual reports and financial statements, will be collected from the central banks of each respective country and analyzed using STATA software. The expected empirical results of this study will contribute to the existing literature on banking efficiency in Arab countries. It will provide insights into which type of banking, either

conventional or Islamic, is more efficient based on the findings. By utilizing DEA analysis, the study aims to enhance banks' efficiency and maximize their benefits from knowledge. Overall, this research endeavors to provide valuable knowledge and contribute to the understanding of banking efficiency in the Arab region, ultimately assisting in the advancement of the banking sector in these countries.

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The abbreviations in this research:

Data Envelopment Analysis	(DEA)
Dubai Islamic Bank	(DIB)
International Islamic Development Bank	(IDB)
Stochastic Frontier Approach	(SFA)
Thick Frontier Approach	(TFA)
Distribution Free Approach	(DFA)
Middle East and North Africa	(MENA)
Gulf Cooperation Council	(GCC)
Decision-Making Units	(DMUs)
dynamic application DEA	(DN-DEA)
Dynamic Network Slack Based Method	(DN-SBM)
Value-added intellectual coefficient	(VAICTM)
Gross Demostic Product	(GDP)