Management Studies and Economic Systems (MSES), 5 (3/4), 137-151, Summer & Autumn 2020

Financial Structure and Economic Growth: An Empirical Study in the MENA Region

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Received 23 November 2020, Accepted 10 December 2020

ABSTRACT:
The relationship between financial structure and economic growth has been explored through three indicators which are related to financial structure amongst eleven different countries based within the Middle East and North Africa region. The first two indicators, which are a measure of financial structure, will be adopted in this paper based on Levine's (2002) study in this field and consist of structure-activity (S-ACT) and structure-size (S-SIZE). The third indicator was calculated using the principal component analysis. This paper not only employs the unbalanced data of eleven countries within the MENA region for the period between 1995-2018, but also aims to achieve an empirical evaluation. The outcomes from the fixed effect regression support the fact that the FS matters to economic growth and exclusively the bank system only when the financial structure is measured by S-ACT, whereas when the other indicators were applied it appeared that there was no significant correlation.

Keywords: *Economic growth, Financial Structure, Bank-based financial system, Market-based financial system, MENA*

INTRODUCTION

Regardless of the geopolitical, social and economic challenges which have braced the Middle East and North Africa (MENA) region, there is, without a doubt, great potential for economic development. In the last few decades, MENA region countries have implemented various reforms to facilitate and increase economic openness, diversification as well as financial development. Despite the fact that such reforms have encouraged investment, trade, and economic growth, they were, however, considered to be incomplete and did not comprehensively address broader economic and social disputes.

In resemblance to the financial systems of various developing nations, countries in the MENA region have witnessed an array of challenges (which have had a severe impact on economic growth) related to their financial system practices compared to their developed counterpart. Even though they have in fact recently experienced significant financial development, the concerned countries' trade and capital flows remain minute on a global level (Cherif and Dreger, 2016).

The financial development of the region is accompanied by improvements in regional and international market integration. It is noteworthy that the region's financial sector is predominantly comprised of banks whereby much of its financial progress was within the banking sector, followed by equities (despite it being relatively underdeveloped) and then by governmental bonds (Hamadi and Bassil, 2015).

Some countries within the MENA region, such as Yemen, only have banks. Concerning the remaining countries, in the late 1990s, countries within the Gulf Cooperation Council, Lebanon,

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and Jordan witnessed broad reforms in the banking sector. Whereas the others have made important advances over the past three decades, such as Egypt, Morocco, and Tunisia (Creane et al., 2006). The banking sectors of MENA countries were dominated by state banks. Nowadays, private foreign and private domestic banks also operate in MENA region, and Islamic and commercial banks along (Mollaha and Zamanb, 2015).

Stock markets in the region are functions of different cultural, institutional, economic and political circumstances compared to those in the other emerging markets. These markets began developing in the late 19th century, with Egypt in the late 20th century and other countries in the region later on. These markets have been marked by impediments of poor liquidity and lack of effective regulatory framework. Moreover, financial development in MENA stock markets have incorporated the diversification of financial instruments offerings and the introduction of derivatives and swaps. Overall, stock markets of countries within the MENA region suffer occasionally from lack of transparency, reliable market information, supervision and regulation (Bouri et al., 2014).

To sum up, the main source of the financial growth in this region is still considered to be as a result of the banking sector. The MENA region is considered to be a bank-based economy (Talbi and Bougatef, 2018), since banks dominate the stock market as a result of the shallow underdeveloped capital markets which don't provide the ideal conditions for firms to access capital with ease. Furthermore, the growth observed in the stock markets is also important in this region and is regarded as continuous and fast-growing (such as United Arab Emirates) despite it being sufficiently unstable, relatively small, illiquid, and poorly diversified. All of these reasons are ultimately considered to be powerful obstacles to increased access to capital markets in the region.

There are various studies which are being conducted in this field of research in order to identify if the financial system leads to economic growth. Moreover, numerous studies have developed an understanding of the financial sector using conventional indicators of financial development (Creane et al., 2004). This is perhaps why the central debates in this field of research revolve around the developments of the financial system and its influence on a country's economy, rather than the impact of its structure (Bhavish et al., 2018). However, the financial structure (FS) lies within its participants and is categorized based on their specific activities into bank-based financial system (BFS) and market-based financial system (MFS) (Goldsmith, 1969 and Levine, 1997 and 2002).

Economists such as Levine (1997 and 2002) and all those who further expanded upon his empirical line of study, suggested that FS has an impact on economic growth. The aim of this paper is to answer the question of whether there is a significant relationship between FS and economic growth amongst eleven countries within the MENA region. Additionally, this question will be asked with consideration of Levine's primary work regarding the correlation between both FS and economic growth. Answering this question will be done utilizing various FS indicators, firstly by calculating the three measure of the FS, these are namely the financial system activity (S-ACT), the financial system size (S-SIZE) and the aggregate financial system (INDEX). The researcher will then proceed to delve deeper into the relationship between these forms of measurements and potential economic growth.

The following paper is organized as follows: the literature review is provided in section two which is divided into two subsections are the theoretical background and the empirical findings, followed by the methodology and description of the data in section three, section four will provide the results, and finally section five will address the conclusion of the study.

Literature Review

Theoretical Background

The definition of a financial system is particularly broad in its nature due to the combination of various financial instruments, markets, and institutions in any given country. Consequently, two main distinctions between them can be drawn; the market-based system and the bank-based system (Demirguc-Kunt and Levine, 2004). Both financial markets and banks have evolved in order to minimize the transaction costs associated with the exchange, saving and investment of money. As a result of the reduction of transactions costs, more multifaceted financial

services were implemented in order to complement the complex financial needs of both investors and borrowers. It should be highlighted that roles of the financial activities are generally projected as the fundamental background of key economic activities, such as providing different financial services to the industry which in turns leads to economic growth (Arestis et al., 2001).

The central theoretical findings that can be derived from literature related to the topic at hand generally revolve around a few key concepts. To begin with, the BFS underlines the constructive influence banks have on what is considered to be a real economy through improving investment efficiency, liquidity risk, and managing intertemporal (Bencivenga and Smith, 1991; Allen and Gale, 2000), as well as, improving capital allocation efficiency and corporate governance (Diamond, 1984), mobilizing capital to exploit economies of scale (Sirri and Tufano, 1995), exploiting economies of scale and information gathering and processing (Levine, 2002), and finally, amplifying the efficiency of firms' debt repayment, particularly in countries with flimsy contract enforcement capabilities (Rajan and Zingales, 1998).

On the other hand, MFS offers better cross-sectional risk sharing (Allen and Gale, 2000) and does not oblige the financing of what is considered to be an "unsuccessful endeavor". Moreover, investors are free to establish portfolios that are considered to be more suited in regard to their return preferences. (Dewatripont and Maskin, 1995) and may as well supply executives with crucial information through the feedback effect of stock prices (Boot and Thakor, 1997; Subrahmanyam and Titman, 1999). MFS also puts forth stronger financial innovation incentives (Boot and Thakor, 1997), and are equipped at funding projects that are subject to a range of opinions (Allen and Gale, 2000).

Empirical Findings

Analysis in regard to the significance of the FS is considered to be relatively limited (Benczúr et al., 2018; Bhavish et al. 2018). Levine's survey in 1997 is considered to be the first wave of evidence in regard to the finance-growth nexus area and in fact has intensified since then. In 2002, Levine also experienced another remarkable achievement where he set up the indices formula to measure FS in a country. This was based on his study with Demirgüç-Kunt (1999). in which the findings indicated that activity (measured as the stock market movement in comparison to banks), size (that is measured as the size of stock markets in comparison to banks), and efficiency (measured as the proficiency of stock markets versus that of banks) are the three indices of FS, with the overall FS being the first principal component. These indicators are still being integrated in contemporary research which investigates the relationship between FS and economic growth.

Previously conducted empirical research which tested the relationship between FS and economic growth was bound to four countries. The researchers of these empirical studies highlighted how Japan and Germany operate under a BFS versus how the UK and the USA operate under a MFS (Goldsmith, 1969). With consideration of Japan's economic performance during the 1990's, a reexamination of the financial system concluded against the implementation of the BFS due to the demand of rent from client firms which led to higher fund costs (Weinstein and Yafeh, 1998). On the contrary, studies which focused primarily on both the UK and the US, paid attention to the role of market takeovers as cooperate devices (Wenger and Kaserer, 1998; Levine, 1997), the results of these studies exhibited an inclination towards MFS. Numerous studies have provided proof in regard to the distinction between the two systems, such as those conducted by Stiglitz (1985) and Singh (1997) who perceive the BFS to better explain growth compared to the MFS. In comparison there are studies, related to both the UK and US, which favor the MFS to focus on the role of market takeover as a cooperate control device (Wenger and Kaserer, 1998).

Later, researchers started to expand upon the countries dataset used in studying the impact of FS on economic growth. Their findings can be categorized into two distinct units: studies which have found that the FS (presence of both BFS and MFS) have no impact on economic growth and those which consider BFS and/ or MFS to have an impact on economic growth.

In detail, studies found that FS (both BFS and MFS) is an insignificant factor in economic growth. A groundbreaking study conducted by Levin (2002) introduces the first national inspection of the structures of both bank-based

and market-based systems on growth. The study incorporated 48 developed and developing countries which utilized OLS estimations with several growth control and instrumental variables in order to identify the relationship between FS and growth. Levine concluded that there was in fact no evidence to support the superiority of either systems.

Through expanding upon Levine's work, some researchers, such as Beck and Levine (2004), not only utilized his indicator, but whose initial hypothesis focused on whether a particular based FS promotes excess growth within 36 industries and 42 countries, particularly those which are deeply reliant on external finance. Another study conducted by Luintel el al. (2008) utilised panel data which consists of 14 countries which ranged between low to middle-class income levels. Moreover, a study conducted by Solo (2013) focused specifically on countries within the African continent in order to avoid the dominance of South Africa's structure effect on the whole panel. In 2018, a study conducted by Mathenge and Nikolaidou focused on countries which lie south of the Sub Sahara. All these studies reached the same conclusion as Levine and concluded that neither BFS nor MFS plays an instrumental role in justifying economic growth which implies that FS is not a significant factor in explaining growth.

On the contrary, there are several studies which suggest that FS or one of its component, banks or markets, does in fact play an instrumental role in justifying economic growth. According to Demirgüç-Kunt and Levine (1999), FS size measurements does not follow a specific pattern the richer a particular country becomes. However, certain patterns do emerge when consideration of both activity and efficiency indicators are taken. This is done by using an aggregate index of FS to which it was concluded that in higher-income countries financial systems tend to gravitate towards MFS.

In 2002, a study conducted by Tadesse utilized two indicators out of the three designated by Demirgüç-Kunt and Levine (1999) in order to prove that there is a correlation between FS and economic growth. It emerged that countries that are considered to have a developed financial system generally have a MFS that outperforms the BFS in this regard.

Pinno and Serletis (2007) found that through using the dataset and variables derived by Levine (2002) it can be proven through evidence that growth in developing countries benefits significantly from BFS whereas in developed countries MFS are more likely to be beneficial. This defies what Levine suggested which was that parameters are considered to be equal amongst various countries.

Other studies utilized the FS indicators developed by Levine (2002) to investigate the relationship between FS and economic growth. The results of these studies were diverse. As suggested by Oima and Ojawang (2013), FS is considered to be significant for economic growth with countries being divided between MFS and BFS. Next, other studies found that in emerging economies such as Brazil, Russia, India, China and South Africa, that despite suffering from potential economic fluctuations, the integration of MFS will result in faster economic growth in the long term as suggested by Bhavish et al. (2018).

Cuadro-Sáez and Herrero (2008), undertook a study which attempted to build a new form of measurement for FS. This measurement essentially took the absolute value of the distance between the size of the banks and markets relative to their joint size. In their study, they were able to establish proof of complementarity between both bank and markets and their correlation with fostering economic development. Similarly, research by Ahmed and Wahid (2010) conducted within African countries using their own constructed FS indicator, suggested that MFS is considered to be fundamental when explaining output growth through the enhancement of both efficiency and productivity.

It is clear that there is a lack of harmony within the field of research in regard to the impact of FS on economic growth. In addition to this, there is scarce empirical literature which addresses the relationship between FS and economic growth. Based on the aforementioned empirical research which has been discussed, this paper is motivated by, and refers closely to the work of Levine (2002) by applying two of his FS indicators the financial system activity (S-ACT) and the financial system size (S-SIZE). While the third indicator the aggregate financial system (INDEX) is different from that of Levine's. Evaluating the correlation between both FS and

economic growth will be examined statistically using regression models.

RESEARCH METHOD

Economic growth is affected by various determinants which have been incorporated in this study and have been derived mainly from research conducted by Solow (1956), Barro (1991), Levine (2002), Demirgüç-Kunt and Levine (2004) and Beck and Levine (2004). Based upon the aforementioned literature, the determinants of economic growth can be classified into four clusters: 1) private investments 2) government policies 3) human capital and 4) socio-political factors. Although the long list of the existing literature has generated many options for the right-hand side variables, one cannot include them all. Consequently, the specification is almost always subject to variables omission problems in addition to restriction by the availability of the key data.

In order to investigate how economic growth from either structure occurs, the econometric model which has been utilized within this study is derived from the research carried out by Levine in 2002. This standard econometric model is expressed in the following equation:

$$Y_{j,t} = \beta_0 + \beta_1 FS_{j,t} + \beta_2 X_{j,t} + \beta_3 Z_{j,t} + e_{it} \quad (3.1)$$

$Y_{j,t}$, denotes the measure for the economic growth of country "j" . As for the right-hand side variables, this consists of regressors for each cluster. To begin with the study's variable of interest ($FS_{j,t}$) is the financial structure ratio. Regarding its parameter β_1: if it is negatively significant this implies that banks grow faster than stock markets (BFS) and their influence on economic performance is accordingly more significant, while if it is positive and significant it indicates that stock markets grow faster than banks (MFS) and their influence on economic performance is therefore more significant (Levine et al., 2001). Then a vector of independent variables ($X_{j,t}$) and vector control variables ($Z_{j,t}$). Moreover, it is important to specify that subscript (j) and (t) represent each country, and time period, respectively, and ($e_{j,t}$) stands for the random error term which indicates the collective non-observant impact from any variables excluded.

In regard to the empirical analysis, an unbalanced panel data of eleven countries within the MENA region which include: Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia and the United Arab Emirates were incorporated. It is important to consider that these countries were selected based on the availability of stock market and bank credit data and they are not currently in the midst of any war or military confrontation. In respect to the empirical analysis, an unbalanced panel of annual observations between the periods starting from 1995 to 2018 were employed. This time frame was selected due to their being an abundance in the number of observations available. The data is collected from the World Development Indicators database, the World Bank's Global Financial Development Database (GFDD), World Federation of Exchanges database, Euromonitor, Bankscope, Bureau van Dijk (BvD), International Monetary Fund, International Financial Statistics and the Global Economy database.

In this article, the dependent variable is measured by the per capita growth rate of the gross domestic product. The most contentious task related to collecting this data set was in regard to compiling a comprehensive and applicable definition of FS and that it was considered a challenge to present an indicator to capture more than one dimension of FS.

Though Levine's (1997) measurement of FS is not representative of the complete picture of FS, it is, however, the first step in untangling the mysterious network of financial channels and in turn allows for empirical studies to be developed. Levine (2002) presents an excellent starting point for measuring FS which is still used today by economists in empirical studies. As mentioned earlier, Levine defines three main indicators for FS where each indicator represents the FS's activity, size, and efficiency, separately. The first two indicators are remarkable because they differentiate between the stock market activity and the stock market size, hence stock markets may be sizable due to a large number of listings but it may have a minimal activity due to the lack of active trading. However, the third indicator is subject to a major weakness related to the measurement for FS because Levine presents an unclear definition of efficiency which weakens the merit of the measurement. This indicator is the

ratio of bank overhead cost to assets times total traded value which is an incompatible comparison of efficiency. Overhead cost ratio intends to measure productive efficiency; whereas total value traded (as Levine argues) is considered to be a measurement of liquidity. Besides, according to generally accepted accounting principles, the overhead cost includes labor and administrative expense, which at times can be used in activities that increase banks' efficiency. Based on Levine's studies in this field (1997 and 2002), two indicators which measure FS will be adopted in this paper. These indices are structure-activity (S-ACT), structure-size (S-SIZE) and will be used to calculate the third and last FS indicator which is structure aggregate (INDEX) using principal component analysis. The third indicator was calculated independently of Levine's line of work and took into consideration the features of the principal component analysis which captures the total variation of S-ACT and S-SIZE. The indicators detailed along with their respective formulas have been included in Table 1.

In order to shed light on the relationship existing between FS and economic growth, a number of regressors must be included. These regressors are selected from a pool of variables which are expected or recognized to be significant explanatory variables to growth based on previous empirical research. The second cluster of variables represented by governmental expenditures relative to GDP (GOV), openness to trade (TRD), and the inflation rate (INF). The third cluster that reflects the human capital includes education, the rate of innovation, and technology transfusion measured by human development index (HDI) and labor force participation rate as a percentage of the total population aged between 15 and 64 (LBR). The control variables are related to the last cluster, socio-political, this kind of variables is considered for sensitivity analyzing the relationship between FS and economic growth, it is measured by the property rights (PRR) and the rule of law (LAW).

Table 1: Definition of Financial Structure Indicators

Measure	Formula	Description
Structure-Activity	$ln \frac{Total\ stock\ traded\ value\ (\%GDP)}{Bank\ private\ credit\ (\%\ GDP)}$	It calculates the domestic stock market's activity relative to that of banks. It is calculated as the logarithm ratio of the total stock market value traded and credit ratio of banks Positive value of the variable (which means the ratio is larger than one before it is exposed to Ln) imply a MFS where the stock market dominates the banking sector, while negative values indicate a BFS.
Structure- Size	$ln \frac{Market\ capitalization\ (\%\ GDP)}{Bank\ private\ credit(\%GDP)}$	It calculates the size of the domestic stock market relative to that of banks. It is calculated as the logarithm ratio of total stock market capitalisation and credit ratio of banks. Positive value of the variable (which means the ratio is larger than one before it is exposed to Ln) imply a MFS where the stock market dominates the banking sector, while negative values indicate a BFS.
Structure-Aggregate (INDEX)	Principal components analysis	This ratio is an overall index of the financial sector. It is calculated the weighted sum of the two indices, which captures their total variation, its calculation is done by the statistical software Stata

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- The following three equations are empirically estimated:

$$GDP_{j,t} = \beta_1 SACT_{j,t} + \beta_2 LBR_{j,t} + \beta_3 PRR_{j,t} + \beta_4 HDI_{j,t} + \beta_5 ln(GOV)_{j,t} + \beta_6 LAW_{j,t} + \beta_7 ln(TRD)_{j,t} + \beta_8 ln(INF)_{j,t} + \alpha_j + \tau_t + e_{j,t} \quad (2)$$

$$GDP_{j,t} = \beta_1 SSIZE_{j,t} + \beta_2 LBR_{j,t} + \beta_3 PRR_{j,t} + \beta_4 HDI_{j,t} + \beta_5 ln(GOV)_{j,t} + \beta_6 LAW_{j,t} + \beta_7 ln(TRD)_{j,t} + \beta_8 ln(INF)_{j,t} + \alpha_j + \tau_t + e_{j,t} \quad (3)$$

$$GDP_{j,t} = \beta_1 INDEX_{j,t} + \beta_2 LBR_{j,t} + \beta_3 PRR_{j,t} + \beta_4 HDI_{j,t} + \beta_5 ln(GOV)_{j,t} + \beta_6 LAW_{j,t} + \beta_7 ln(TRD)_{j,t} + \beta_8 ln(INF)_{j,t} + \alpha_j + \tau_t + e_{j,t} \quad (4)$$

The estimation technique used is the fixed effects regression, the selection of this technique over the random effects model was based on Hausman's test results (Table 2). This estimation technique assumes that the estimator has common slopes and variance but country-specific intercepts, and that the regressors are treated as fixed parameters. Testing the relationship between FS and economic growth under the fixed effect model will be done by including the country and year fixed effects. Accordingly, the three models will be as shown above, after adding the following variables: α_j is the coefficient for country fixed effects, τ_j is the coefficient for time fixed effects.

Table 2: Hausman Test Results for Models 2, 3 and 4

Hausman Test Result for Model 2 (S-ACT as FS Indicator)
TEST: HO: DIFFERENCE IN COEFFICIENTS NOT SYSTEMATIC
CHI2(8) = (B-B)'[(V_B-V_B)^(-1)](B-B)
= 16.08
PROB>CHI2 = 0.0413
(V_B-V_B IS NOT POSITIVE DEFINITE)
Hausman Test Result for Model 3 (S-SIZE as FS Indicator)
TEST: HO: DIFFERENCE IN COEFFICIENTS NOT SYSTEMATIC
CHI2(8) = (B-B)'[(V_B-V_B)^(-1)](B-B)
= 13.52
PROB>CHI2 = 0.0952
(V_B-V_B IS NOT POSITIVE DEFINITE)
Hausman Test Result for Model 4 (INDEX as FS Indicator)
TEST: HO: DIFFERENCE IN COEFFICIENTS NOT SYSTEMATIC
CHI2(8) = (B-B)'[(V_B-V_B)^(-1)](B-B)
= 16.14
PROB>CHI2 = 0.0405
(V_B-V_B IS NOT POSITIVE DEFINITE)

RESULTS AND DISCUSSION

Descriptive Statistics

Table 3 displays the means, standard deviations, and numbers of observations for all variables used for the period from 1995 to 2018. It also reports the characteristics of these variables. This table reveals a different observation number for each variable; therefore, this data is an unbalanced panel data. The unequal number of observations did not affect the regression results because the missing values were skipped and the sample size was adjusted accordingly. Plus, all variables reveal substantial inequality and high variability suitable for more examining.

Furthermore, the table enables one to recognize the presence of a significant heterogeneity within countries, for example, the S-ACT indicator recorded a maximum value of (5.63) and a minimum value of (0.16) illustrating large variation across countries. A similar varied range of values is noticed for many other variables as well. All these variances result from the difference in development levels within countries incorporated in the study. While the remaining two FS indicators; The S-SIZE indicator presents a minimum value of (0.0003) and a maximum value of (2.4838) illustrating large variation across countries. In the matter of the third FS indicator, the INDEX has a negative mean value, which translates into some countries having values much smaller than the mean. The indicator presents a minimum value of (-1.696991) and a maximum value of (4.485628) illustrating enormous variation across countries, this is due to the difference in development levels of the whole financial system (activities and size) between the countries incorporated in the study.

Panel Data Analysis

This study aims to investigate the impact of FS over time; therefore, the use of a fixed effect model over random effect is based on the Hausman test results and the three equations' test results which rejects the null hypothesis. The second equation is with S-ACT as a FS indicator, the third with S-SIZE as a FS indicator, and the fourth equation with INDEX as a FS indicator display p-value of p-value= 0.0413, p-value= 0.0952 and p-value= 0.0405 the three values are less than 0.1, respectively (Table 2).

Then, testing for heteroscedasticity is performed using the Breusch-Pagan test, the presence of heteroscedasticity is identified within the three equations. As shown in Table 4, the test results presented a p-value for S-ACT at 0.0022, S-SIZE at 0.0051 and INDEX at 0.0035, these values are less than 0.1 causing the rejection of the null hypothesis that the error term is homoscedasticity. The heteroscedasticity problem was corrected with a robust standard error performed by STATA software.

Table 3: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	248	2.938522	2.599331	0.0129596	15.98924
S-ACT	232	2.134532	1.32377	0.0158104	5.634318
S-SIZE	229	0.6250064	0.5208753	0.0003663	2.483892
INDEX	224	-2.70e-09	1.233515	-1.696991	4.485628
LBR	253	60.66696	13.458	41.568	88.075
HDI	240	0.7449375	0.0815851	0.499	0.866
GOV	253	17.40565	5.2814	6.73	33.01
TRD	253	22.71502	12.53382	0.5	57.6
INF	253	3.552053	3.590062	0.0571506	29.50661
LAW	253	0.3632411	0.2464682	0	1
PRR	250	52.684	15.07865	20	90

Finally, the test related to time-fixed effects shows that there's no need to add the time-fixed effect within the three equations. As per the run test and the results presented in Table 5, the Prob>F is greater than 0.1 for the three equations, thus the researcher failed to reject the null hypothesis stating that the coefficients for all the years are jointly equal to zero. Accordingly, in the estimation process time-fixed effects are not needed.

The estimation results of the above equations are presented in the following section, categorized each by FS indicator, then each variable coefficient is analyzed and linked to the previous literature reviews. Finally, the overall model indicators such as R-squared are presented and expanded upon.

Table 4: Heteroscedasticity Test Results for Model 2,3,4

Heteroscedasticity Test Result for Model 2 (S-ACT as FS Indicator)
TEST: BREUSCH-PAGAN / COOK-WEISBERG TEST FOR HETEROSKEDASTICITY HO: CONSTANT VARIANCE VARIABLES: FITTED VALUES OF WGDP CHI2(1) = 9.36 PROB > CHI2 = 0.0022
Heteroscedasticity Test Result for Model 3 (S-SIZE as FS Indicator)
TEST: BREUSCH-PAGAN / COOK-WEISBERG TEST FOR HETEROSKEDASTICITY HO: CONSTANT VARIANCE VARIABLES: FITTED VALUES OF WGDP CHI2(1) = 7.84 PROB > CHI2 = 0.0051
Heteroscedasticity Test Result for Model 4 (INDEX as FS Indicator)
TEST: BREUSCH-PAGAN / COOK-WEISBERG TEST FOR HETEROSKEDASTICITY HO: CONSTANT VARIANCE VARIABLES: FITTED VALUES OF WGDP CHI2(1) = 8.51 PROB > CHI2 = 0.0035

Table 5: Time-Fixed Effects Test Results for Models 2,3 and 4

Time-Fixed Effects Test Result for Model 2 (S-ACT as FS Indicator)
F(22, 212) = 1.08 PROB > F = 0.3732
Time-Fixed Effects Test Result for Model 3 (S-SIZE as FS Indicator)
F(22, 212) = 1.32 PROB > F = 0.1634
Time-Fixed Effects Test Result for Model 4 (INDEX as FS Indicator)
F(22, 212) = 1.24 PROB > F = 0.2151

Structure Activity

In order to test S-ACT, which is the FS indicator, on economic growth, Table 6 shows the estimation outcomes of model 2.

The coefficient of the S-ACT is -0.317 and significant at 10% level. The regression results are not consistent with Levine's study (2002) indicating that FS is not significantly related to economic growth. Essentially, these results are consistent with those who support the integration of a bank-based economy. These supporters expect a negative relationship between growth and the FS measures (Stiglitz, 1985; Singh,1997 and Tadesse 2002).

1. The labor participation rate is insignificant.
2. HDI is negatively signed and statistically significant at 10% level recording a coefficient of 15.722.
3. Government spending is insignificant.
4. The trade openness coefficient is not significant.
5. The inflation coefficient is significant at 10% level and has a negative sign shown with a value of 0.431.
6. The socio-political variables property rights index and the rule of law index couldn't show a statistically significance coefficients.
7. The constant is positive and significant at 5% level.

Finding R-square indicates the "goodness of fit" of the model. R-square is the multiple coefficients of determination, this is the proportion of variance in the dependent variable GDP per capita, which can be explained by the used independent variables. The R-squared value scored 44.27%, which is higher than that R-squared value in Levine's study when he used the same FS indicator (40.5%). Moreover, it is an overall measure of the strength of association and does not reflect the extent to which any particular independent variable in the suggested regression model is associated with the dependent variable. Besides, R-squared in panel data is not considered extremely descriptive, because the type of data plays a big role if it is a cross sectional data heterogeneity presence will decrease its value opposed to time series data.

The overall regression F-statistic recorded a value less than 0.05, is highly significant, which means that the joint coefficients are statistically significantly different from zero.

Structure Size

Table 7 represents the outcomes of model 3, which reflects the relation between FS (measured by S-SIZE) and economic growth.

The second FS indicator shows different results from the first one. The S-SIZE is insignificant. The result is consistent with Levine (2002), where he didn't find any significant relationship between S-SIZE and economic growth.

Regarding the remaining independent variables that were significant in the previous model, most still show significant results

1. The labor participation rate is insignificant.
2. The HDI coefficient is -15.140 and statistically significant at 1 % level.
3. Government spending is insignificant.
4. The trade openness is insignificant
5. The inflation coefficient is -0.488 and significant at 5% level.
6. The property rights index and the rule of law index are insignificant and negatively signed.
7. The constant is positive and significant at 5% level.

R-squared is 42.4%, which is higher than the R-squared (30.8%) obtained with Levine (2002) when he used a similar FS indicator. The overall regression F-statistic (0.0001) is highly significant, which means that the joint coefficients are statistically significantly different from zero.

Structure Aggregate (INDEX)

The output of testing the impact of FS on economic growth using INDEX (being a proxy for FS) as demonstrated in model 4 is presented in Table 8.

It is observed that the key independent variable (INDEX) does not have any significant impact on economic growth.

Even though the regression output shows different coefficient of economic growth determined under different FS indicators, yet, it still shows some parallel results with them

1. The labor participation rate is negatively insignificant
2. The HDI coefficient is negatively significant at 1%.
3. Government spending is insignificant.
4. The trade openness coefficient is negative and insignificant.

5. The inflation coefficient is significant at 10% level with a positive sign
6. The property rights index and the rule of law index are insignificant is negatively insignificant
7. The constant is positive and significant at 5%

In sum, the good-fit of R-square is 43%. This model can't be compared to Levine's model, since the used indicator is not identical to Levine's. The overall regression F-statistic is highly significant for both estimators, which means that the joint coefficients are statistically significantly different from zero, 0.0004 (which is <0.05)

Table 6: Fixed Effects Regression Result of Model 2 (S-ACT as FS Indicator)

FIXED-EFFECTS (WITHIN) REGRESSION				NUMBER OF OBS = 253		
GROUP VARIABLE: ID				NUMBER OF GROUPS = 11		
R-SQ:				OBS PER GROUP:		
WITHIN = 0.4427				MIN = 23		
BETWEEN = 0.0846				AVG = 23.0		
OVERALL = 0.0039				MAX = 23		
F(8,234) = 4.87						
CORR(U_I, XB) = -0.8929				PROB > F = 0.0000		
GDP	COEF.	ROBUST STD. ERR.	T	P>|T|	[95% CONF.	INTERVAL]
S-ACT	-0.3169546	0.1332456	-2.38	0.018	-0.5794689	-0.0544402
LBR	-0.0427969	0.0542256	-0.79	0.431	-0.1496298	0.0640359
PRR	-0.0221479	0.0136557	-1.62	0.106	-0.0490517	0.004756
HDI	-15.72159	4.283752	-3.67	0.000	-24.16123	-7.281937
LNGOV	1.028831	1.057349	0.97	0.332	-1.054308	3.111971
LAW	-2.092193	0.8596146	-2.43	0.166	-3.785766	-0.3986207
LNTRD	0.0214252	0.3721777	0.06	0.954	-0.7118221	0.7546726
LNINF	-0.4313239	0.1818162	-2.37	0.008	-0.073118	-0.7895298
CONS	16.67754	4.883611	3.42	0.001	7.056075	26.299
SIGMA_U	2.509898					
SIGMA_E	2.0594044					
RHO	0.59764222 (FRACTION OF VARIANCE DUE TO U_I)					
This table reports empirical results from estimating model 2. It presents the results obtained from fixed-effects (within-groups estimator) method. Fixed-effects estimators are based on robust standard errors corrected for potential heteroskedasticity and time-series autocorrelation within each country.						

Table 7: Fixed Effects Regression Result of Model 3 (S-SIZE as FS Indicator)

FIXED-EFFECTS (WITHIN) REGRESSION				NUMBER OF OBS = 253		
GROUP VARIABLE: ID				NUMBER OF GROUPS = 11		
R-SQ:				OBS PER GROUP:		
WITHIN = 0.4236				MIN = 23		
BETWEEN = 0.1075				AVG = 23.0		
OVERALL = 0.0001				MAX = 23		
F(8,10) = 4.83						
CORR(U_I, XB) = -0.9097				PROB > F = 0.0001		
(STD. ERR. ADJUSTED FOR 11 CLUSTERS IN ID)						
GDP	COEF.	ROBUST STD. ERR.	T	P>|T|	[95% CONF.	INTERVAL]
S-SIZE	-0.231029	0.4111139	-0.56	0.587	-1.147048	0.6849898
LBR	-0.056177	0.0644027	-0.87	0.404	-.1996751	0.0873211
PRR	-0.0279113	0.0197105	-1.42	0.187	-0.071829	0.0160064
HDI	-15.13978	4.521402	-3.35	0.007	-25.21409	-5.065467
LNGOV	0.7772018	1.43535	0.54	0.600	-2.420958	3.975361
LAW	-1.74307	1.171366	-1.49	0.168	-4.353036	0.8668951
LNTRD	-0.0865037	0.3332232	-0.26	0.800	-0.8289712	0.6559638
LNINF	0.4879901	0.2087252	2.34	0.041	0.0229214	0.9530588
CONS	17.64178	6.726624	2.62	0.025	2.653932	32.62963
SIGMA_U	2.6278919					
SIGMA_E	2.0822121					
RHO	.61431866 (FRACTION OF VARIANCE DUE TO U_I)					

This table reports empirical results from estimating model 3. It presents the results obtained from fixed-effects (within-groups estimator) method. Fixed-effects estimators are based on robust standard errors corrected for potential heteroskedasticity and time-series autocorrelation within each country.

Table 8: Fixed Effects Regression Result of Model 4 (INDEX as FS Indicator)

FIXED-EFFECTS (WITHIN) REGRESSION				NUMBER OF OBS = 253		
GROUP VARIABLE: ID				NUMBER OF GROUPS = 11		
R-SQ:				OBS PER GROUP:		
WITHIN = 0.4297					MIN = 23	
BETWEEN = 0.1071					AVG = 23.0	
OVERALL = 0.0004					MAX = 23	
F(8,234) = 4.36						
CORR(U_I, XB) = -0.9103			PROB > F = 0.0004			
GDP	COEF.	ROBUST STD. ERR.	T	P>|T|	[95% CONF.	INTERVAL]
INDEX	-0.2113428	0.1470474	-1.44	0.152	-0.5010488	0.0783632
LBR	-0.05534	0.0547266	-1.01	0.313	-0.1631598	0.0524798
PRR	-0.0263896	-0.0263896	.0135944	-1.94	-0.0531726	0.0003934
HDI	-15.36346	-15.36346	4.311998	-3.56	-23.85875	-6.868156
LNGOV	0.9090574	0.9090574	1.063786	0.85	-1.186764	3.004878
LAW	-1.955094	-1.955094	0.8774085	-2.23	-3.683724	-0.2264645
LNTRD	-0.0641866	0.3744191	-0.17	0. 864	-0.8018497	0.6734766
LNINF	0.4747393	0.1819632	2.61	0. 009	0. 1162438	0.8332347
CONS	17.22049	4.927252	3.49	0.001	7.513051	26.92794
SIGMA_U	2.6683718					
SIGMA_E	2.0750162					
RHO	0.62316384 (FRACTION OF VARIANCE DUE TO U_I)					

This table reports empirical results from estimating model 4. It presents the results obtained from fixed-effects (within-groups estimator) method. Fixed-effects estimators are based on robust standard errors corrected for potential heteroskedasticity and time-series autocorrelation within each country.

CONCLUSION

Through the employment of data across a wider range and time span, this study aims to answer whether FS matters in regard to the economic growth of eleven countries within the MENA region. This question emerges as a result of the contradictory results obtained through previous studies which delved deeper into the relationship between FS and economic growth and were left with results which were considered to be dubious. Therefore, a significant amount of both theoretical and empirical work is still required in order to clarify this relationship.

Towards the end, the empirical element of this article tests the relationship between both FS and economic growth within eleven countries within the MENA region by utilizing three indicators for FS, which consist of; S-ACT, S-SIZE and INDEX. It should be noted that the economic growth of these countries was measured by GDP per capita.

The results of this study indicate that only one indicator is considered to be significant, that of which is the S-ACT indicator and in turn reflects the importance of bank systems in promoting economic growth. Hence, this assured that the countries within the MENA region are bank-based countries and that regression confirmed that this is essentially the reason for any detected economic growth prompted by the financial system. Accordingly, it is advised that this region should focus on improving its stock market's as a means to improve overall efficiency within the economy and to also foster economic growth.

Finally, it is of utmost importance to recognize that this research study may have certain limitations such as the usage of a proxy to measure the FS. This is despite the fact that not only is it a recurring trend within contemporary literature, but, is also a widely accepted means of conducting research which investigates the relationship between FS and economic growth

and that both indicators, S-Act and S-Size (which was proposed by Levin, 2002) are utilized in this instance. It is suggested that a direct measurement for BFS and MFS to be established rather than an indicator for the whole financial structure and that this, in turn, should enhance the model and consequently strengthen the cultivation of empirical results.

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