

The Impact of Financial Sector Development on Economic Growth in the Middle East and North Africa

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ABSTRACT

This paper investigates the impact of financial sector development on the economic growth and the causality relationship between economic growth and financial sector development. The sample of the study included 11 Middle Eastern and North African countries over the period from 1980 to 2009. Using both static and dynamic techniques of estimation, the empirical results demonstrated that most indicators of financial sector development had a positive and significant impact on economic growth. Thus, this result provides evidence supporting the “demand-leading” hypothesis, which implies that a country can speed up the development of its financial sector by pursuing policies that enhance growth in the real sector. These results emphasize the immense need for reforming the financial sector in order to foster the regulatory environment, such as access to credit which, in turn, will have ample ramifications on the countries of the region.

Keywords: Financial sector development, Middle East and North Africa region, economic growth, demand-leading hypothesis, supply-leading hypothesis.

INTRODUCTION

The marked differences in terms of income per capita in the world and the substantial discrepancies in per capita growth rates across countries have attracted much theoretical research as well as empirical research in recent years on the economic growth process. Traditionally, there are two main factors that substantially contribute to economic growth process: an increase in the capital stock accumulation and an increase in the productivity of production factors (Mhadhbi, 2014). The recent theoretical and empirical works on economic growth have shown a dire essence of financial sector development as a factor that

tremendously decreases the transaction and information costs. This thereby ameliorates allocative efficiency of resources and raises the output through stimulating the amount of capital accumulation, both physical and human, and technological innovations and thus results in long-run economic growth (Levine, 1997).

The literature reveals that there are mixed and conflicting streams of thought about the relationship between financial sector development and economic growth where some economists argued that economic growth causes development in the financial sector and this refers to the “demand-leading” hypothesis (Friedman & Schwartz, 1963). In contrast, others postulated that financial sector development ultimately causes growth and this is called the “supply-leading” hypothesis (McKinnon, 1973; Shaw, 1973). Other economists argued for the existence of mutual impact between growth and the development of financial sector, where each leads to the other (Greenwood & Smith,

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1996). On the other hand, others argued for the lack of existence of a relationship between these variables (Lucas, 1988).

These inconclusive and divergent thoughts are due to the fact that these results come from different regions where conclusions based on cross-country analysis are absolutely biased to the sample of countries selected, biased to estimation methods and techniques employed in the analysis, biased to the size and length of data frequency, biased to the functional form utilized for modeling the relationship, and further biased to financial sector development and economic growth proxies utilized. Furthermore, the results are biased due to the discrepancy in the environment of legal and regulatory frameworks that prevails in each individual country¹, and on the perception of various economic agents about the role of the financial sector (Grais & Kantur, 2003).

Therefore, this research paper is the first research paper, to the best of our knowledge, which examines the relationship between financial sector development and economic growth for 11 countries from the Middle East and North Africa region. The indicators employed are more reflective of the banking sector development rather than the non-banking financial intermediaries because these countries are vastly dominated by the banking sector rather than non-banking financial intermediaries. This sector in the region remains under research relative to other regions, where there is a lack of evidence regarding the finance-growth nexus. This is because there has been little amount of work done for the Middle Eastern and North African countries regarding the major and essential factors that determine the financial sector development, as well as the measures or appropriate

¹ One of the practices for the banking sector in the Middle East and North Africa region that hinders the efficiency of the sector to divert funds to the highly profitable investments is considering collateral as essential condition for lending, which consequently leads to limited access to credit by most economic agents and thereby adverse impacts on growth (Arab Credit Reporting Guide, World Bank Group, 2015)

proxies for financial sector development (Creane *et al.*, 2004).

Therefore, in this research paper, we assess the role of the financial sector development in the economic process for a sample of 11 countries in the region in order to propose various policies to enhance the economic performance of the financial sector. Furthermore, the paper investigates the direction of causality between financial sector development indicators and long-run economic growth for 11 countries in the region from 1980 to 2009. The latter is done due to the fact that causality direction between financial sector indicators and economic growth definitely has particular and special importance of these countries. In particular, adequate knowledge about causality will greatly assist authorities in determining the appropriate strategic policies to further boost and promote the financial sector reform in relation to the reforms of other sectors in order to speed up the pace of economic growth.

In addition, the paper utilizes the static technique, which comprises the Pooled OLS estimator, Fixed Effect and Random Effect estimators, and the dynamic panel data estimator, i.e. Generalized Method of Moments (GMM) for estimating the parameters in the panel model that connect the financial sector development indicators to economic growth.

The (GMM) technique of estimation exhibits that most financial sector development indicators, domestic credit to the private sector as a percent of GDP and the broad money supply M2 as a portion of GDP, exert a positive and significant impact on the real GDP per capita over the study period from 1980 to 2009. On the other hand, the third proxy of the financial sector development, bank deposits as a ratio of GDP, affects the real GDP per capita negatively and significantly for the sample countries in the region.

The paper proceeds as follows: the paper provides a review of previous studies that are highly relevant to the

core of the paper. The paper then presents the research methodology followed by the main hypotheses and then reveals the empirical results. Finally, the paper provides the conclusions and some policy implications for authorities in the Middle East and North Africa.

1. Literature review and previous studies

Since the early 1990s, there has been a growing recognition of the direct and positive impact of financial sector development on economic activities. Both theoretical and empirical studies showed that a well-developed financial sector is definitely beneficial for the economy as a whole. Specifically, the financial sector plays a major role in ameliorating market imperfections and diverting funds to the highly profitable investments. This improves capital accumulation and thus promoting and fostering the economic growth (Levine & King, 1993a, b).

Moreover, the financial sector system can affect economic growth by influencing the saving rate, the fraction of savings channeled to investment or the social marginal productivity of investment. Therefore, financial sector development will have positive plentiful impacts on economic growth (Mhadhbi, 2014).

In addition, the financial sector system is active due to the existence of market imperfections that may hinder the process of direct trading between savers and investors in an optimal way. The most important market imperfections are the informational asymmetries that may prevail between savers and investors (Hassan *et al.*, 2011). Thus, the financial sector system arises to fill these informational gaps, because it has a comparative informational advantage over the ultimate investors and savers (Scholtens & Wensveen, 2003). More deeply, the literature examines two channels through which the financial sector system can affect economic growth: capital accumulation and technological innovation. Regarding capital accumulation, growth models postulate that the functions performed by the financial

sector system affect the steady-state growth by influencing the rate of capital formation. The financial sector system affects capital formation either by altering saving rates or by reallocating savings among various capital producing technologies (Levine, 1997).

Concerning the technological innovation side, growth models substantially emphasize on the invention of new production processes (Romer, 1990). Romer (1990) further argued that these new processes and ideas have spillovers with ample positive and plentiful ramifications, particularly, on the long-run economic growth. Therefore, Romer (1990) postulated that economic growth is dominantly fueled by accumulating knowledge and technology innovations, thereby constructing a strong link between the level of human capital and the long-run economic growth, which emphasizes the immense need for a developed financial sector. Furthermore, Lucas (1988) assumed that a permanent and consistent increase in the time allocated for learning definitely leads to a permanent rise in the economic growth of output per worker.

In contrast to Solow Model, where technological progress is exogenous and thus the financial sector does not need to be funded, new growth theory attempts to explain the sources of technological progress through ideas, international openness, and human capital formation (Levine, 2005). Certainly, this does not mean that Solow has overlooked the essence of the financial sector and its crucial role in the growth process, rather he presumed that markets are competitive and there are no market imperfections, which consequently justified his argument of not funding the financial system in order to ameliorate these imperfections.

Therefore, an adequate level of financial sector development is necessary to realize the full potential of innovation for economic growth. However, if the financial system is adequately developed, then it may or may not result in increasing capital accumulation and technological innovations if the economy does not

pursue macroeconomic policies of stability, if the economy lacks competition in its financial system, or if the financial system does not have rigid legal and transparent institutional framework to control its financial activities (Creane *et al.*, 2004).

A substantial extensive amount of investigations has been carried out, which aimed at examining the conflicting theoretical growth-finance nexus where these empirical investigations have utilized cross-country growth regression techniques, specifically, where the real GDP per capita over certain period is regressed on some indicators of the financial sector development and a group of control variables (Levine & King, 1993a, b; De Gregorio & Guidotti, 1995). The problems with pure cross-country investigations are well documented in the growth-finance nexus literature. Precisely, these methods fail to explicitly address the potential biases induced by the endogeneity of the regressors, and the existence of heterogeneity among various countries. These problems have led to misleading and inconsistent estimates (Quah, 1993). Due to these problems, recent empirical studies have utilized dynamic panel data methods of estimation, such as the Generalized Methods of Moments (GMM) to control for the potential roots of heterogeneity and endogeneity that lead to biased coefficient estimates in cross-country regressions (Levine *et al.*, 2000).

Based on data from 1960 to 1989 for 77 countries, one of the principal studies is the seminal paper conducted by Levine & King (1993a). This study has constructed four various financial sector development indicators namely: the ratio of liquid liabilities divided by the nominal GDP, the ratio of deposit money bank domestic assets to deposit money, bank domestic assets plus central bank domestic assets, the ratio of domestic credit to the non-financial private sector to total domestic credit (excluding credit to money banks), and the ratio of credit to the non-financial sector as a portion of nominal GDP. They found that “higher levels of

financial development are significantly and robustly correlated with faster current and future rates of economic growth, physical capital accumulation, and economic efficiency improvements”. Moreover, they concluded that the link between financial sector development and growth is not just a contemporaneous correlation. Instead, they deduced that “finance seems important to lead to economic growth”, which afterwards opened the door for causality analysis between financial sector development proxies and long-run economic growth.

Levine (1997) used data from 1975 to 1993 and examined a sample of 44 less developed and developed countries in which he investigated the relationship between the development of banking sector and economic growth. In this study, Levine (1997) used a new variable for the financial sector development, i.e. BANK, which refers to credit issued by deposit money banks channeled to the private sector as a ratio of nominal GDP. His empirical outcomes provided evidence of the existence of a strong positive relationship between exogenous components of banking sector development with physical accumulation, output growth, and productivity growth. Furthermore, Levine *et al.* (2000) retested not only the relationship between financial sector development and economic growth, but also the channels through which the variations in the financial sector development proxies can influence growth in terms of physical accumulation, private saving rates, and the total factor productivity. Once again, GMM was utilized to correct for potential simultaneity biases.

Eng and Habibullah (2006) explored the causal relationship between the financial sector development and economic growth of 13 developing Asian countries from 1990 to 1998. Their study employed the system GMM technique estimator and conducted causality analysis. Their findings revealed that financial sector

development enhances economic growth, thus supporting the “supply-leading” hypothesis.

Regarding the finance-growth nexus for the Middle Eastern and North African countries in particular, Thai and Chuah (2004) investigated the causality direction for six countries from the Middle East and North Africa region from 1973 to 2002. Their results provided evidence of bidirectional causality for most countries. Al-Rjoub *et al.* (2006) utilized panel data for 11 countries from the Middle East and North Africa region. They demonstrated that most proxies of financial sector development are insignificant and do not exert a positive impact on growth except for the domestic credit as a percentage of GDP, which affects the growth significantly and positively. Boulila and Trabelsi (2006) investigated the causality direction between financial sector development and growth for a sample from the Middle East and North Africa region from 1960 to 2002. Their findings showed that causality runs primarily from the real sector to the financial one. Additionally, their results demonstrated that there is a tenuous support to the view that financial development is a strong determinant of the long-run economic growth. Al-Malkawi and Abdullah (2011) studied the panel dataset for 13 countries from the Middle East and North Africa region from 1985 to 2005. The study primarily utilized the static techniques for estimating the empirical model connecting growth and indicators of financial sector development. Their results revealed the existence of a positive and significant relationship between financial sector development and economic growth. Moreover, Hook and Falahaty (2013) reinvestigated the empirics of finance-growth nexus employing the Fully Modified OLS estimator for a sample of 9 countries from the region from 1991 to 2009. Their results showed that financial sector development proxies exert a positive and significant impact on the long-run economic growth for these countries. Furthermore, Marashdeh, *et al.* (2015) employed large dataset for 8 countries from the region

from 1975 to 2012 and utilized both static and dynamic estimation techniques. Their findings exhibited that financial sector development positively and significantly impact long-run economic growth.

Thus, this paper contributes to the literature by exploring the finance-growth nexus for 11 countries from the Middle East and North Africa region from 1980 to 2009. The paper utilizes three indicators for financial sector development namely: Domestic Credit to Private Sector as a percent of GDP, the broad money supply M2 as a ratio of GDP, and Bank Deposits as a portion of GDP. Moreover, following the literature, the dependent variable in this study is the real GDP per capita and the control variables that are considered as major determinants of growth are trade openness as a percent of GDP, government expenditure as a ratio of nominal GDP, consumer price index, and gross capital formation.

Furthermore, the paper employs both static and the Dynamic Panel Estimator (GMM) techniques to estimate the empirical model. In addition, the Granger Causality Test is carried out between the various indicators of financial sector development and real GDP per capita. Therefore, to the best of our knowledge, this is the first study that considers wide dataset for 11 countries in the Middle East and North Africa region and uses both static and dynamic techniques of estimation.

2. Methodology

For the case of the Middle East and North Africa region economies, the financial system is classified to be underdeveloped for the following reasons. Firstly, domestic credit to private sector divided by nominal GDP per capita is quietly limited relative to other regions in the world². Secondly, the financial sector in the region lacks competition due to the existence of barriers for entry and high concentration (Creane *et al.*, 2004). Thirdly, some banks are owned totally or partially by the state (Sahay & Bredenkamp, 2015), and most

² Arab Credit Reporting Guide, World Bank Group, 2015

importantly that the financial sector is much less sensitive to the variations in the monetary policy relative to other regions in the world (Davoodi & Abed, 2003).

Therefore, we can deduce that positive variations in proxies of financial sector development may or may not lead to positive impact on the economic growth for the target countries due to three major causes. Firstly, the existence of a less developed financial system as explained earlier. Secondly, proxies utilized to measure financial sector development are not perfectly reflective for the functions carried out by the financial sector itself (Levine *et al.*, 2000). Thirdly, there is massive discrepancy in the regulatory and supervisory environment of the financial sector across the various countries (Hook & Falahaty, 2013). Thereby, the level of development for the financial sector within the Middle East and North Africa region itself varies where some countries have well-developed financial sector, such as Jordan, Qatar, Saudi Arabia and Oman, while others have medium level of development for financial sectors, such as Tunisia, Egypt, Morocco, and Algeria. On the other hand, other countries such as Iran and Syria have low level of development for their financial sector (Creane *et al.*, 2004).

In conclusion, since the Middle East and North Africa region economies have less developing financial sector, then initially the paper hypothesizes that the financial sector development in the region's economies is positively associated with long-run economic growth provided that all other factors remain unchanged. This can be depicted by the scatter plots in Figure 1 between proxies of financial sector development and real GDP per capita growth rates.

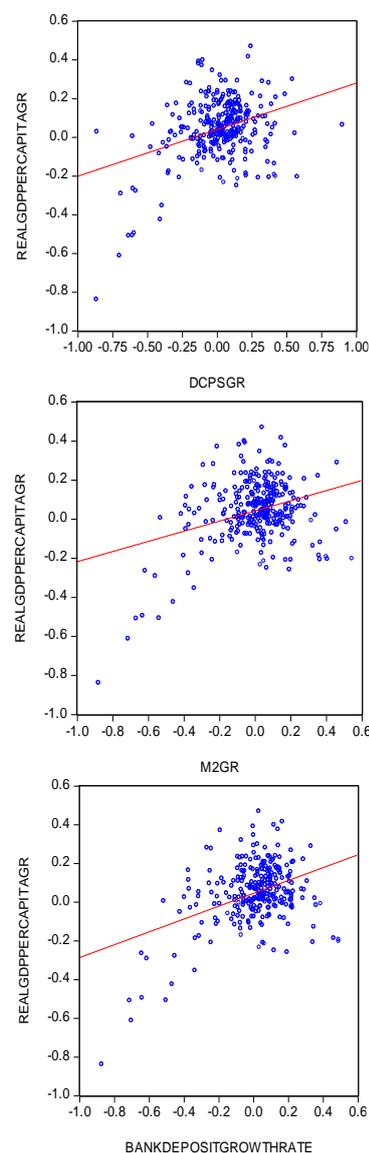


Figure (1): real GDP per capita growth rates vs. growth rates for financial sector development indicators: growth rates of domestic credit diverted to the private sector as a percent of GDP, growth rates of broad money supply M2 as a portion of GDP, and growth rates of bank deposits as a ratio of GDP respectively.

Following Levine (1997), the above hypothesis can be represented by the following growth model which is utilized commonly in the literature, including the financial sector development variables, control variables and the proxy for economic growth. Thus, the model can be expressed using the following linear form:

$$\ln RGDP_{it} = \alpha_i + \beta_1 \ln OPN_{it} + \beta_2 \ln GOVGDP_{it} + \beta_3 \ln CPI_{it} + \beta_4 \ln GCF_{it} + \beta_5 \ln M2GDP_{it} + \beta_6 \ln BDGDP_{it} + \beta_7 \ln DCPSGDP_{it} + U_{it}$$

where $\ln RGDP_{it}$ is the natural logarithm for real GDP per capita for country i during year t , $\ln OPN_{it}$ is the natural logarithm for openness for country i during year t ; $\ln GOVGDP_{it}$ is the natural logarithm of government expenditure as a percent of GDP for country i during year t , $\ln CPI_{it}$ is the natural logarithm of consumer price index for country i during year t , $\ln GCF_{it}$ is the natural logarithm for gross capital formation for country i during year t , $\ln M2GDP_{it}$ is the natural logarithm for broad money supply M2 as a percent of GDP for country i during year t , $\ln BDGDP_{it}$ is the natural logarithm of bank deposit as a percent of GDP for country i during year t , $\ln DCPSGDP_{it}$ is the natural logarithm of domestic credit to private sector as a percent of GDP for country i during year t , and U_{it} is the random error term that captures the other variables.

Therefore, to investigate the impact of financial sector development on the long-run economic growth, the paper examines the following null hypotheses:

H₀: There is no significant impact for the Domestic Credit to Private Sector as a percent of GDP on the real GDP per capita for countries in the Middle East and North Africa region.

H₀: There is no significant impact for the broad money supply M2 as a ratio of nominal GDP on the real GDP per capita for countries in the Middle East and North Africa region.

H₀: There is no significant impact for the bank deposits as a portion of nominal GDP on the real GDP per capita for countries in the Middle East and North Africa region.

H₀: The real GDP per capita growth rate does not Granger Cause growth rate in the various financial sector development indicators.

For the purpose of estimating the parameters of the empirical model that connects between economic growth and the indicators of financial sector development, the study employed representative annual data for a sample of 14 countries in the region, namely (Algeria, Egypt, Iran, Jordan, KSA, Morocco, Oman, Qatar, Syria, Tunisia, and Turkey) over the period stretching from 1980 to 2009.

The data sources for this research paper are the IMF publication International Financial Statistics (CD-ROM, 2009) and World Development Indicators, 2015 (World Bank).

3. The empirical results

Table 1 below presents the descriptive statistics of (Model 1) variables. The table shows that the mean of real GDP per capita is low for the Middle East and North Africa region on average relative to the rest of the world, where the natural logarithm of world real GDP per capita was 8.97³ in 2000. Conversely, the natural logarithm of the region real GDP per capita on average is 8.164, which consequently imposes deep challenges on the region, on average, to pursue policies to implement further economic reforms, including reforms in the financial sector. Regarding the indicators of the financial sector development: the natural logarithm of world money supply M2 as a percent of GDP in 2000 was 4.60⁴, the natural logarithm of domestic credit to private sector as a ratio of GDP in 2000 was 4.87⁵, and the region bank deposits as a portion of GDP is quite limited relative to the rest of the world⁶. This undoubtedly reveals that the financial sector development proxies are far below the world average

³ World Development Indicators 2015, <http://data.worldbank.org/wdi>.

⁴ The previous reference.

⁵ The previous reference.

⁶ Arab Credit Reporting Guide, World Bank Group, 2015.

which shows the dire need to pursue further policies for reforming the financial sector.

lnRGDPPC: natural logarithm for real GDP per capita, lnOPN: natural logarithm for trade openness, lnGOVGDP: natural logarithm for government expenditure as a portion of GDP, lnCPI: natural

logarithm of Consumer Price Index, lnGCF: natural logarithm of gross capital formation, lnM2GDP: natural logarithm of M2 as a ratio of GDP, lnBDGDP: natural logarithm of bank deposits divided by GDP, lnDCPSGDP: natural logarithm of domestic credit to private sector as a percent of GDP

Table (1): Descriptive statistics for (Model 1) variables

Variable	Mean	Median	Max	Min	SD
lnRGDPPC	8.164	7.794	11.21	6.76	1.025
lnOPN	4.25	4.26	5.01	3.38	0.339
lnGOVGDP	3.42	3.43	3.93	2.81	0.239
lnCPI	4.265	4.50	5.25	0.916	0.696
lnGCF	3.23	3.23	3.85	2.51	0.274
lnM2GDP	4.03	3.94	4.94	3.26	0.406
lnBDGDP	3.65	3.64	4.66	2.57	0.492
lnDCPSGDP	3.37	3.52	4.52	1.36	0.731

Table 2 below demonstrates the correlation matrix for variables of (Model 1). The correlation matrix depicts that real GDP per capita has a positive association with the domestic credit to the private sector as a percent of GDP, it also has a positive but tenuous association with bank deposits as a ratio of GDP. However, the real GDP per capita is negatively correlated with the broad money supply M2 as a portion of nominal GDP. This negative association induces the weakness and lack of transparency in the supervisory and regulatory frameworks on average in the target countries (Demetriades & Law, 2006). Furthermore, the correlation matrix demonstrates that real GDP per capita has a positive relation with gross capital formation which, in turn, reveals the crucial essence of capital accumulation in economic growth process. Here, the role

of the financial sector in ameliorating the market imperfections and diverting the credit to the highly profitable investment is evident. This consequently has ample ramifications on the process of the economic growth through capital accumulation and technological innovations (Marashdeh *et al.*, 2015).

lnRGDPPC: natural logarithm for real GDP per capita, lnOPN: natural logarithm for trade openness, lnGOVGDP: natural logarithm for government expenditure as a portion of GDP, lnCPI: natural logarithm of Consumer Price Index, lnGCF: natural logarithm of gross capital formation, lnM2GDP: natural logarithm of M2 as a ratio of GDP, lnBDGDP: natural logarithm of bank deposits divided by GDP, lnDCPSGDP: natural logarithm of domestic credit to private sector as a percent of GDP

Table (2): Correlation matrix for (Model 1) variables

Correlation Matrix	lnRGDPPC	lnOPN	lnGOVGDP	lnCPI	lnGCF	lnM2GDP	lnBDGDP	lnDCPSGDP
lnRGDPPC	1.000							
lnOPN	0.054	1.000						
lnGOVGDP	0.223***	0.297***	1.000					
lnCPI	0.187**	0.342***	0.330***	1.000				
lnGCF	0.123*	-0.0395	-0.286***	-0.37***	1.000			
lnM2GDP	-0.331***	0.463***	0.306***	0.097	0.130*	1.000		
lnBDGDP	0.005	0.357***	0.357***	-0.030	0.27***	0.81***	1.000	
lnDCPSGDP	0.220***	0.534***	0.1022	-0.003	0.106	0.45***	0.57***	1.000

Furthermore, Table 3 below depicts the results of Levin, Lin & Chu unit root test for variables of Model 1. The test manifests that real GDP per capita, trade openness, consumer price index, and gross capital formation are all stationary at the level. However, government expenditure as a percent of nominal GDP and various proxies of the financial sector development are stationary at the first difference.

lnRGDPPC: natural logarithm for real GDP per

capita, lnOPN: natural logarithm for trade openness, lnGOVGDP: natural logarithm for government expenditure as a portion of GDP, lnCPI: natural logarithm of Consumer Price Index, lnGCF: natural logarithm of gross capital formation, lnM2GDP: natural logarithm of M2 as a ratio of GDP, lnBDGDP: natural logarithm of bank deposits divided by GDP, lnDCPSGDP: natural logarithm of domestic credit to private sector as a percent of GDP

Table (3): Levin, Lin & Chu Unit Root Test for (Model 1) variables

Variable	Level			1 st Difference			Result
	None	Intercept	Intercept & Trend	None	Intercept	Intercept & Trend	
Levin, Lin & Chu Unit root test							
lnRGDPPC	-1.060	-2.982***	-1.658**	-8.790***	-5.502***	-4.006***	I(0)
lnOPN	-0.5002	-1.581*	-1.911**	-11.71***	-3.911***	-1.244*	I(0)
lnGOVGDP	-1.134	-1.307*	0.7601	-10.12***	-3.693***	-4.638***	I(1)
lnCPI	2.603	-4.138***	-2.244**	-4.758***	-3.334***	-2.085**	I(0)
lnGCF	-0.478	-1.858**	-1.336*	-13.18***	-6.817***	-5.339***	I(0)
lnM2GDP	3.266	0.175	1.245	-9.674***	-4.391***	-3.553***	I(1)
lnBDGDP	4.298	-1.396*	-1.164	-9.126***	-4.341***	-2.999***	I(1)
lnDCPSGDP	2.303	-0.939	0.028	-10.20***	-2.672***	-0.154	I(1)
*** Significant at 1 percent ** Significant at 5 percent * Significant at 10 percent							

Table 4 below presents the results of various techniques employed to estimate Model 1. Pooled OLS estimator exhibits that both financial sector development proxies, domestic credit to private sector as a ratio of GDP and bank deposits as a portion of nominal GDP exert a positive and significant impact on the real GDP per capita at 1% level of significance. As domestic credit ratio increases by 1%, the real GDP per capita grows at a rate of 0.525% annually. This result goes in line with several studies (e.g. Al-Rjoub *et al.*, 2006; Marashdeh *et al.*, 2015; Muhammad & Islam, 2015). In addition, as bank deposit portion increases by 1%, the real GDP per capita grows at a rate of 0.868%. However, the broad money supply M2 as a percent of nominal GDP exerts a negative and significant impact on the real GDP per capita. This finding agrees with that of Mhadhbi (2014), where some proxies of the financial sector development exert a negative impact on growth due to the fact that the results are biased to the nature of the proxy itself and to the sample of countries considered in the analysis. Furthermore, the Pooled OLS reveals that gross capital formation has a positive and significant effect on the real GDP per capita. Regarding the robustness of the Pooled OLS, the table below depicts that that R-Squared is 58.4% and F-statistic is highly significant. However, there is cross-sectional serial correlation using the Breusch-Pagan LM, Pesaran Scaled LM, and Pesaran CD tests.

In order to control for heterogeneity among countries, we conducted both Fixed Effect and Random Effect estimators, and the Hausman Test demonstrates that the omitted variables are correlated with the regressors, which leads us to infer that the Fixed Effect estimator is the appropriate estimator. Similar to the Pooled OLS estimator, the Fixed Effect estimator demonstrates that only the broad money supply M2 impacts the real GDP per capita positively and significantly at 5% level of significance. Furthermore, the Fixed Effect estimator suffers from the problem of cross-sectional serial correlation. Therefore, the GMM estimator will be the

highly robust estimator due to its plentiful advantages, such as tackling the problems of biases resulted from misspecification and the problem of ruling out or alternatively omitting some explanatory variables. Moreover, GMM estimator deals with the problem of endogeneity for these explanatory variables. GMM also avoids the unit root problems for instrumental variables and further uses the lags of the dependent variables (Bates & Nkurunziza, 2003).

In Table 4 below, GMM estimator shows that all financial sector development indicators exert a significant impact on the real GDP per capita, where the broad money supply M2 exerts a positive and significant impact on the real GDP per capita. As M2 portion of nominal GDP increases by 1%, the real GDP per capita, in turn, grows by 3.342% annually. Moreover, as the portion of domestic credit diverted to private sector increases by 1%, the real GDP per capita grows by 0.526% annually. These results are in line with the results obtained by other researchers (e.g. Levine, 1997; Levine *et al.*, 2000; Al-Malkawi & Abdullah, 2011; Muhammad & Islam, 2015). However, as the bank deposits as portion of nominal GDP increase by 1%, the real GDP per capita will decline by 3.49%. This result is expected due to the fact that increasing the bank deposits means increasing the size of saving funds, which is supposed to be reflected as an increase in investments and growth in the real output. However, this is not the case for Middle East and North Africa region economies over the study period, which induces that there is an inefficient allocation of credit, high concentration and tenuous competition in the financial sector, and lower degree of institutional quality and legal frameworks (Sahay & Bredenkamp, 2015; Hook & Falahaty, 2013). Moreover, GMM estimator shows that trade openness exerts a positive and significant effect on the real GDP per capita, while government expenditure as a percent of GDP exerts a positive and insignificant impact on the real GDP per capita. Regarding the gross fixed capital formation impact on growth, the GMM

estimator depicts its insignificant negative effect on growth. Furthermore, regarding the robustness of the GMM estimator, the J-statistic is insignificant, which means that the selection of instrumental variables is appropriate. The Arellano-Bond Test for serial correlation also reveals that the model generated using GMM estimator has no serial correlation. Thus, we can deduce that GMM estimator for Model 1 is significantly robust.

lnRGDPPC: represents the natural logarithm of real GDP per capita, lnOPN: represents the natural logarithm

of trade openness, lnGOVGDP: represents the natural logarithm of government expenditure as a percent of GDP, lnCPI: represents the natural logarithm of consumer price index, lnGCF: represents the natural logarithm of gross capital formation, lnM2GDP: represents the natural logarithm of broad money supply M2 as a ratio of GDP, lnBDGDP: represents the natural logarithm of bank deposit as a portion of GDP, lnDCPSGDP: represents the natural logarithm of domestic credit diverted to private sector as a percent of GDP.

Table (4): Results of various techniques for estimation of (Model 1)

Variable (lnRGDPPC)	Pooled OLS	Fixed Effects	Random Effects	GMM
Constant	3.051**	5.005***	5.875***	----
Control Variables				
lnOPN	-0.079	0.339**	0.181	1.711***
lnGOVGDP	1.441***	-0.950***	-0.837***	0.143
lnCPI	0.459***	0.271***	0.1455**	5.693***
lnGCF	1.172***	0.449***	0.504***	-0.053
Financial Deepening Variables				
lnM2GDP	-2.522***	0.5102**	0.0325	3.342***
lnBDGDP	0.868***	-0.0083	0.439*	-3.49***
lnDCPSGDP	0.525***	0.097	0.138*	0.526*
Diagnostic tests				
R-Squared	0.584	0.968	0.427	----
F-Statistic	35.999***	301.49***	19.118***	----
Jarque-Bera test	48.811***	5.025*	32.495***	----
J-Statistic	----	----	----	1.0001
Hausman test	----	----	54.602***	----
Redundant fixed effects F(10,169)	----	167.875***	----	----
Breusch-Pagan LM	200.176***	182.625***	237.37***	----
Pesaran Scaled LM	12.793***	11.119***	16.34***	----
Pesaran CD	5.238***	10.041***	12.92***	----
Bias-corrected scaled LM	----	10.890***	----	----
Arellano-Bond Serial Correlation Test: AR(2)	----	----	----	1.245
* ** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent				

Furthermore, the Granger Causality is conducted to investigate whether the financial sector development indicators Granger Cause a growth rate in the real GDP per capita or that the change in real GDP per capita consequently causes a change in the variables that estimate the development of the financial sector. Whenever we say that financial sector development indicators Granger Cause growth in the real GDP per capita, this means that we can predict the values of real GDP per capita growth rate from the values of the financial sector development indicators. Table 5 below demonstrates the results of Granger Causality Test between financial sector development indicators and real GDP per capita growth rates. The table below shows that all the financial sector development indicators do not Granger Cause the real GDP per capita growth for the Middle East and North Africa region countries from 1980 to 2009. However, the test reveals that real GDP per capita growth rate Granger Causes domestic credit to

private sector as a percent of nominal GDP growth, Granger Causes broad money supply M2 divided by nominal GDP growth, and also Granger Causes growth in bank deposit as a ratio of GDP. Thus, these results provide evidence supporting the “demand-leading” hypothesis, which states that growth in the real GDP per capita causes development in the financial sector. This means that whenever the income of economic agents increases in an economy, their demand for the various financial sector services increases as well, leading consequently to the financial sector development. This result is in agreement with the result generated by Boulila and Trabelsi (2006) and many others.

RGDPPCGR: the real GDP per capita growth rate, DCPSGR: growth rate of domestic credit to private sector as a ratio of GDP, and M2GR: money supply M2 as a portion of GDP growth rate, BDGDPGR: growth rate of bank deposits as a ratio of GDP

Table (5): Granger causality test between financial sector development indicators and real GDP per capita growth rates

Pairwise Granger Causality Tests			
Sample: 1980 2009			
Lags: 2			
Null Hypotheses:	Obs	F-Statistic	Prob
BDGDPGR does not Granger Cause RGDPPCGR	258	1.811	0.164
RGDPPCGR does not Granger Cause BDGDPGR		4.174	0.016
DCPSGR does not Granger Cause RGDPPCGR	288	0.185	0.831
RGDPPCGR does not Granger Cause DCPSGR		3.199	0.046
M2GR does not Granger Cause RGDPPCGR	290	0.986	0.374
RGDPPCGR does not Granger Cause M2GR		4.008	0.019

4. Conclusions and recommendations

This paper has utilized both static and dynamic techniques of estimation for the parameters of the empirical model that connects between financial sector development proxies and economic growth in order to

examine the role that the financial sector plays in the economic growth process for the sample of 11 countries from the Middle East and North Africa region from 1980 to 2009.

The results have clearly demonstrated that financial

sector has a vital role to play in the growth process in these countries by providing appropriate services that increase intermediation efficiency and induce a better allocation of resources, better accumulation of both human and physical capital stock, and rapid technological innovations; thereby leading to higher rates of long-run economic growth.

The paper has employed three indicators for financial sector development, which are commonly utilized in the literature: the money supply M2 as a percent of nominal GDP, domestic credit by banks to the private sector as a portion of nominal GDP, and bank deposits as a ratio of nominal GDP. Moreover, the paper has used the real GDP per capita as a proxy for economic growth.

For the estimation of Model 1, the Pooled OLS estimator showed that all financial sector development proxies exert a significant impact on real GDP per capita for the sample of 11 countries from the region from 1980 to 2009. Similarly, The GMM estimator of Model 1 demonstrated that as money supply M2 as a portion of nominal GDP increases by 1%, the real GDP per capita grows, in turn, by 3.342%, whereas real GDP per capita rises 0.51% using the Fixed Effect estimator. As the domestic credit to private sector as a percent of nominal GDP rises by 1%, the real GDP per capita grows by 0.53%. However, as bank deposits as a percentage of nominal GDP increases by 1%, the real GDP per capita drops by 3.485%, which clearly indicates that the negative impact of some financial sector development proxies on growth can be interpreted due to inefficient allocation of credit, inefficient credit regulation as well as high concentration of banking sector in the region. This results agrees with those obtained by Hook and Falahaty (2013). Regarding the first three hypotheses, the GMM estimator results offered evidence to reject these hypotheses where domestic credit to the private sector as a percent of GDP and broad money supply M2 divided by GDP both positively and significantly impact the real GDP per capita, whereas the bank deposits

affects the real GDP per capita negatively and significantly. For the last hypothesis, the Granger Causality test exhibited that real GDP per capita growth Granger Cause all growth rate in all indicators of the financial sector development, which leads to the rejection of the last hypothesis.

Furthermore, policy implication from the results of estimation for the empirical model was that financial reform in the region should continue to be complemented with the reform in the real sector so that all the reforms will ultimately be supportive to boost the economic growth process in the region. Moreover, financial sector reform should include reduction in government intervention in allocation of credit and strengthen the quality of institutional and regulatory system. Specifically, a significant portion of bank lending is utilized to finance economic activities of the public sector, restricting the finance availability diverted into private investors. This consequently has an adverse impact on economic growth, where the Middle East and North Africa region has the least globally portion of private firms utilizing banks to fund their enterprises (Creane *et al.*, 2004; Al-Malkawi & Abdullah, 2011). More clearly, this reveals that governments should have less involvement in the financial sector, including cutting back on state ownership of banks and minimizing monetary financing of deficits of the budget. Moreover, the governments should promote competition by preventing monopoly and high concentration of the banking sector and restricting entry barriers for the sector (Gazdar & Cherif, 2012).

The positive impact of gross fixed capital formation on the real GDP per capita in the estimation of static version for Model 1 points out to areas of further investigation. This investigation has to focus on the channels by which the variations in the financial sector development can affect economic growth. Additionally, one further question that needs be addressed and further interpreted is the negative effect of bank deposits on the

real GDP per capita by considering or controlling for the legal and regulatory environment for each individual country. This consequently will enable us to explain precisely why increasing the savings has an adverse impact on the real GDP per capita. Furthermore, the study should have considered additional proxies for financial sector development in addition to domestic

credit, money supply M2, and bank deposits that could further reflect the functions performed by the sector, such as including data on the structure and concentration of banking sector, access to finance, regulatory and legal framework of the sector, payments system and many more.

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تأثير تطور القطاع المالي على النمو الاقتصادي لدول الشرق الأوسط وشمال إفريقيا

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ملخص

تهدف هذه الورقة البحثية إلى المساهمة في الدراسات التطبيقية حول تأثير تطور القطاع المالي على النمو الاقتصادي، كما تهدف إلى دراسة العلاقة السببية بين النمو الاقتصادي وتطور القطاع المالي ضمن عينة مكونة من 11 دولة من منطقة الشرق الأوسط وشمال إفريقيا خلال الفترة الزمنية من 1980 إلى 2009. تشير نتائج الاختبارات الساكنة والديناميكية إلى أن معظم مؤشرات تطور القطاع المالي لها أثر ايجابي وهام على النمو الاقتصادي لدول المنطقة. لذا، فإن هذه النتائج تدعم فرضية "قيادة الطلب" التي تقضي أن بإمكان الدولة تسريع تطور القطاع المالي من خلال تطبيق سياسات تحفز النمو في القطاعات الانتاجية. هذه النتائج تشدد على الحاجة الملحة إلى إعادة هيكلة القطاع المالي من أجل تحسين البيئة التنظيمية لهذا القطاع مثل سهولة الحصول على التسهيلات الائتمانية، الأمر الذي سيكون له نتائج إيجابية على دول المنطقة.

الكلمات الدالة: تطور القطاع المالي، دول منطقة الشرق الأوسط وشمال إفريقيا، النمو الاقتصادي، فرضية قيادة الطلب، فرضية قيادة العرض.

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