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A Re-examination of the Finance-Growth Nexus for the MENA region using Static and Dynamic Panel Data

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Abstract

This paper contributes to the existing empirics of finance-growth nexus of MENA countries based on a longer time period (1975-2012). It incorporates additional control variables such as FDI and an interaction term of FDI and financial development variables. It employed four estimation techniques, Pooled OLS, Fixed effect estimation, Random effect estimation, and the system GMM estimation, and used static and dynamic panel data. It obtains a robust finding of consistently no impact of financial sector development (FSD) on economic growth of MENA countries to all estimation techniques. The paper exemplifies that FSD especially, the banking sector has not been strong and efficient enough to effectively influence the economic growth. It strongly recommends the strengthening of the ongoing efforts of financial sector reforms, its supervision, monitoring and evaluation. The FDI effect on economic growth is positive and significant in all four estimation methods. Fixed capital formation contributes positively while trade openness and government expenditures have not played any significant role in the growth of MENA countries during the study period.

Keywords: Financial development, economic growth, Panel data, MENA countries and system GMM

JEL Classification Codes: F21. G1. G28. O4

1. Introduction

Endogenous growth theory stresses the importance of financial development on economic growth in the literature (Greenwood & Jovanovic, 1990; Jbili, Enders and Treichel, 1997). The argument is, financial intermediaries and financial markets respond to market incompleteness endogenously and promote economic growth through (i) mobilization of savings, (ii) improvement in efficiency of resource allocation, (iii) reduction in information asymmetry and transaction costs, (iv) diversification of investment risks, and finally, (v) through the stimulation of innovation in technology.

Given the above assertion and expectation, most developing countries have started reforming their financial system to improve the efficiencies of financial intermediaries and markets to achieve a desired level of financial sector development (FSD) to promote economic growth. The Middle Eastern and North African (MENA) countries are no exception to this endeavor since early 80s. These

countries witness a series of financial sector liberalization & policy changes. These changes are (i) a reduction and elimination of interest rate subsidies usually provided to the priority and selective sectors of the economy; (ii) availing as well as managing of necessary liquidity in the banking system with hitherto more active use of reserve requirements, and making use of market-based financial decisions (using the demand and supply options) for refinancing any potential enterprises and projects; (iii) introduction of new banking law and regulations to make the central banks of the MENA region more autonomous, and finally, (iv) introduction of prudential regulations at par with international standards, and updating the stock markets legislation and activities (Ben Naceur et al., 2008). The MENA economy is usually bank-based. This is because banks and similar kinds of financial institutions are mostly the driving forces to mobilize, channel, direct, supervise, monitor and finally, evaluate the financial resources to investment with minor participation of the stock and bond markets.

To assess the degree of financial developments across the MENA countries, Creane et al (2004) used a subset of information.¹ They found that the MENA countries individually vary substantially; some are well advanced and some have scope for significant improvement. The MENA region as a whole ranks far behind in financial development to those of the industrialized countries, and the East Asia (ibid. 2004).

To date, the quest for finance-growth nexus in the MENA region is insatiable with inconclusive and inconsistent results (shown in appendix 1). Given this backdrop, this paper makes an attempt to carefully re-assess the links between FSD and economic growth. This study differentiates from all the previous studies in a variety of ways: (i) unlike the previous studies, it applies four estimations techniques, Pooled Cross-section, Fixed effect, Random effect and the System GMM estimations, and used static and dynamic panel data, (ii) it uses a balanced and larger recent data period 1975 – 2012 for 14 MENA countries, and finally, (iii) it incorporates additional control variables, such as FDI and an interaction of FSD and FDI variables, among other standard control variables.

The study finds the evidence that FSD do not contribute to the economic growth of the MENA region in all four estimation methods. The study results indicate that foreign direct investment contributes positively to the growth of the MENA countries during the study period with no benefits from the joint influence of financial development and FDI. Fixed capital formation is an important contributing factor in the economic growth of this region. Trade openness and government expenditures show no significant impact on the economic growth of the MENA countries. Given the backdrop of many factors leading to otherwise performances on the finance-growth nexus, the study recommends that the government of the MENA countries individually must implement the ongoing financial sector reforms to make the financial market complete and competitive.

This paper proceeds as follows. In section 2 it discusses the theoretical framework, literature review & justification of the study. Then the paper discusses the empirical model in section 3 inclusive of FSD indicators and control variables employed, followed by the methodology of the study. The data type and their sources, and the results of the econometric works are explained in section 4. Finally, section 5 concludes the paper.

2. Theoretical Framework, Literature Review & Justification of the Study

The theoretical literature goes back to Schumpeter (1911) who highlighted the importance of FSD in the process of economic growth where financial institutions encourage innovation and determine productive investment. Robinson (1952) finds rather less role of FSD and their importance to economic growth. She argues, on the contrary, that an increase in output increases the demand for financial resources and services, and hence, economic growth promotes FSD.

¹ To assess the financial sector development of any country, it requires full knowledge of the following information set, (i) development of monetary sector and monetary policy, (ii) banking sector development, (iii) non-bank financial sector development, such as pension funds, insurance markets, real estate markets and etc., (iv) regulation and supervision, (v) financial openness, and finally, (vi) institutional quality: this relates to strength of creditor rights.

While the previous literature such as, Gurley & Shaw (1955), Patrick (1966) and Goldsmith (1969) established the importance of FSD in the process of economic growth, the more established theoretical foundation of finance-growth nexus came after the pioneering works of McKinnon (1973) and Shaw (1973). They argue that excessive government control and central bank regulations over financial institutions and markets in developing countries distort the natural decision making process in mobilizing savings and investment due to artificially imposed low interest rates and discretionary investment decisions by the government in selective priority sectors. Consequently, depressed savings and inefficient investment allocation tend to become a normal outcome retarding the economic growth. Financial liberalization they argue, by letting the market to determine the rate of interest in the banking sector and allocating the credit based on the viability and productivity of the borrowers (free from any control), make the economic growth faster. In this process, higher interest rate would encourage the mobilization of higher savings with hitherto more efficient allocation of scarce financial resources to more productive and efficient investments to make the economic growth quicker. These are the arguments echoed and substantiated earlier by Schumpeter (1911) on the finance-growth nexus.

The importance of FSD on economic growth gets its full momentum in studies using the endogenous growth model originally developed by Romer (1986 & 1990), Lucas (1988) and Barro (1991). Following this framework, several studies (Greenwood & Jovanovic, 1990; Bencivenga and Smith, 1991; Roubini and Sala-i-Martin 1992; Pagano, 1993; King & Levine 1993a, b; and Deidda, 2006) made an explicit treatment of information collection and analysis, risk sharing and liquidity provisions offered by financial intermediaries, to explain how the operations of the financial sector might affect the rate of economic growth. These studies found FSD to be generally growth promoting (Levine, 1997). However, Levine (1998) argues that governments, based on the evidence of causality between the finance-growth nexus, may discern whether the need for reforms is required to be prioritized in the financial sectors. One group (Schumpeter, 1911; King & Levine, 1993a,b; Roubini and Sala-i-Martin, 1992) is in favor of policies and reform to improve the financial system, while another group (Robinson, 1952; Lucas, 1988; Stern, 1989; and Stiglitz, 1994) is in favor of doing nothing. This is because economic growth per se promotes finance, and not vice versa.

The seminal contribution of finance-growth nexus starts with Goldsmith (1969) where a causal relationship is explored with a mixture of financial intermediaries and markets influencing economic growth. King and Levine (1993a) improve Goldsmith's work with a larger sample size by introducing additional control variables, and find a positive effect of financial variables on all indicators of economic growth. King and Levine (1993b) also confirm the above results under alternative econometric methodologies.

Levine (1998) introduces the legal factor as an instrumental variable (IV) uncorrelated with economic growth beyond its link with finance and other growth determinants to overcome the biased results. Levine (1999) and Levine et al. (2000) use the legal determinants of banking developments as instrumental variables for financial intermediation indicators to control for simultaneity bias. They apply the GMM techniques developed for dynamic panels for a data set: 1960-1995, each averaged over seven five-year periods, and find a positive impact of FSD on economic growth. They find the exogenous component of banking developments strongly related to (i) per capita income growth, (ii) productivity improvement, and finally, (iii) capital formation. Beck and Levine (2004) also apply the same techniques, and find a significantly positive effect of both stock market and bank based measures on economic growth free from biases induced by simultaneity, omitted variables or un-observed country specific effects. Rioja and Valev, (2004a) study the above relationship and find that FSD contributes to economic growth by enhancing the productivity growth only for industrial countries, and for developing countries by increasing capital accumulation. Rioja and Valev, (2004b) find the above relationship stronger for rich countries and weaker for low income countries.

Most econometric studies on the MENA region are summarized in appendix 1. The results are equally divided². All MENA studies are of different variants in terms of country coverage with substantial differences in the mixes of the country cohort. They differ in financial measures used along with other control variables. They use a wide range of time period for each study, and finally, they apply a variety of econometric techniques to address an array of objectives in various studies: these include the long run versus short run dynamics of finance-growth nexus with causality issues embedded and few other studies simply investigate the impact of FSD on economic growth, while keeping aside the causality issue secondary or even no consideration of it.

MENA countries differ in the level of financial developments. This is because their reform process of the financial system is at various lengths of intensity and maturity. As a result, the selection of countries in a particular MENA cohort against another may influence the average impact of FSD on economic growth of that particular cohort differently than another cohort. Similarly, the differences in financial measures³ might also bring on average, a differential outcome in econometric results. Further, the use of a wide range of time period⁴ by various MENA studies might also create a substantial variation in the outcome of finance-growth nexus. This happens particularly, when different cohorts of MENA countries are at various stages and degree of financial sector development. Consequently, inconsistent and inconclusive findings from various MENA studies are not unlikely. And finally, use of various econometric techniques, some with unique consideration to a particular data set (s): static and dynamic panel data sets, as required by a particular technique (s) to overcome the problems associated with instrumental variables, dummies, heterogeneity, endogeneity, and simultaneity bias and etc, might also cause the results of the finance-growth nexus in the MENA region to be different and otherwise, than a priori.

Since the above results on the finance-growth nexus are mixed, the need for a hitherto more systematic econometric study is very important. The present study has therefore, embarked upon to revisit the finance-growth nexus in MENA region by applying systematically four econometric techniques unlike any previous studies. With this end, discussions continue further in sections 3 & 4 below.

3. Empirical Model and Methodology

3.1. Empirical Model

This study is an attempt to examine whether financial sector development contributes to the economic growth of the MENA countries along with the role of FDI on the growth of these countries. Additionally, we examine whether the level of financial development and FDI together contributes to the enhancement of economic growth of the MENA countries (that is, whether the interaction between financial development and FDI contributes to economic growth). To examine all these issues we employ a panel data model that is similar to a typical growth model. Specifically, the model used is as follows:

$$GR_{it} = \alpha FD_{it} + X_{it}\beta + \mu_i + \eta_t + u_{it} \quad (1)$$

Where GR_{it} is the growth rate of the real GDP per capita for country i in period t , FD_{it} is the logarithm of financial development variable for country i in period t and all other independent variables (control variables) including FDI and the interaction of FDI and financial development, are captured by the vector X_{it} ; μ_i is a country specific effect, and η_t is a fixed time effect, u_{it} is a random error term that

² Out of 22 econometric studies 11 studies showed positive effect of FSD on economic growth, 8 studies showed negative results and 3 studies showed either weak or no impact of FSD on economic growth.

³ one inclusive of both bank based and market based measures with unbalanced data set of the later and another with only bank-based measures

⁴ some considering the data set containing the information of remote past (almost 20 years prior to the start of financial reform process that is, from very early 60s to early 2000), while in some others, the data set from mid or late 70s, or from mid and late 80s, to until early 2000

captures all other variables. In the dynamic version of the model, the vector X_{it} also includes the lagged dependent variable.

Financial Development Indicators

Financial development is generally defined as an improvement in the quality and quantity of financial intermediary services. Improvement is revealed in financial indicators through transactions between financial institutions and non-financial economic entities including outstanding bank loans and money supply. In this study two indicators that measure the financial development of a country are employed. One is the total domestic credits available to the private sector from banks as a percentage of GDP (DC) and the other indicator is a broad money supply as a percentage of GDP (M2). The DC variable is used to measure the financial depth, while M2 measures the real size of the financial sector of the country. The DC variable represents the actual resources that are channeled to the private sector by commercial banks, whereas a higher value of the M2 variable indicates a larger financial sector, and a bigger financial intermediation⁵.

Controlled Variables

We controlled for the effects of diverse variables deemed by the literature as potential determinants of economic growth and included some additional variables considered to be important to contribute to the economic growth of the MENA countries. Specifically, our analysis includes initial GDP per capita (IGDPC), foreign direct investment (FDI), a variable representing the interaction of FDI and financial development, trade openness (Trade), government expenditures (GE), gross fixed capital formation (I) which measures national investment (both private and national) and inflation rate (Inf) as our control variables. A brief description with expected sign of these variables is discussed in Table 1 below.

Table 1: Brief Description of Control variables

The Variable	Description
IGDPC	The logarithm of initial real GDP per capita; this variable will provide evidence of any convergence effects. The expected sign of the variable is negative.
FDI	Foreign direct investment; the expected sign of the variable is positive.
INTERACT = FSD*FDI (FSD is either DC or M2)	This variable is used to capture the role of FSD in enhancing the contributions of FDI on economic growth. This variable is expected to have a positive sign.
Trade	Trade openness is the ratio of the sum of exports and imports to GDP. There is no conclusive sign for this variable although a positive sign is more likely than otherwise.
GE	Government final consumption expenditure as a ratio of GDP. It captures the size of the government. It may either have a positive or a negative sign depending upon the type of government spending.
I	Gross fixed capital formation as a percentage of GDP. This variable is expected to have a positive sign.
Inf	Inflation rate. This variable is expected to have a negative sign.

3.2. Methodology

The relationship between FSD and economic growth is studied based on equation (1) above. The coefficients of equation (1) are estimated by making use of four different estimation techniques: Pooled OLS, fixed effect estimation, random effect estimation, and system GMM. The first three estimation techniques were employed to estimate the static version of the model, while the system GMM is employed to estimate the dynamic version of equation (1).

⁵ Due to non-availability of a consistent data set on stock market development in all the MENA countries for the sample period: 1975-2012, this study does not consider it as an indicator of financial development in above model.

Pooled OLS ignores any heterogeneity among the countries involved. Additionally, since most of the variables under study are likely to be endogenous, the OLS estimators are more likely to be inconsistent. While Fixed and Random effect estimation deals with the heterogeneity issue, these estimation approaches however, do not deal with the endogeneity issue, in particular, when equation (1) includes the lagged dependent variable. The results based on Pooled OLS, fixed effect model and random effect model should therefore, be interpreted with caution since it is invalidated by endogeneity. Our presentation here is basically for the purpose of testing the robustness of the results to those obtained with the system GMM estimator.

The system GMM approach deals with the problem of omitted unobserved variables by taking first differences, and it also tackles the issue of endogeneity and reverse causality by using the lagged values of the independent variables as instruments. Consequently, we can reliably examine the impact of exogenous component of financial development on economic growth for the GCC countries. This system estimator approach has been widely used recently in growth regressions. Bond et al. (2001) and Hauk and Wacziarg (2009) pointed out that the system GMM estimators should be employed for growth regressions to generate consistent and efficient parameter estimates. The system GMM deals with the shortcomings of the standard GMM estimator. Further details of the system GMM approach can be found in Arellano and Bover (1995) and Blundell and Bond (1998).

Few tests are conducted to find out which of the estimation techniques (among Pooled OLS, Fixed and Random effects) provides the most appropriate coefficient estimates. The F-test and the LM test were carried out to test the validity of the fixed effect and random effect, respectively, and the Hausman test was conducted to see the appropriateness of the fixed vs. random effect estimation approaches. For all the estimation approaches, we used robust estimators to deal with the existence of possible heteroscedasticity and autocorrelation problems.

In applying the system GMM estimation technique, we conducted two specification tests suggested by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998). One is the Sargent test for the over-identification restrictions to test the overall validity of the instruments (the null hypothesis is: the instruments are valid) and the second one is a second-order serial correlation test conducted in the first differenced residuals to examine the hypothesis that the error term is not serially correlated. It is to be noted that the GMM estimator is consistent when the lagged values of the explanatory variables are valid instruments as well as when the autocorrelation test confirms the adequacy of the model specification.

Section 4 Data and Results

4.1. Data

Our panel data set includes fourteen MENA countries (Algeria, Bahrain, Egypt, Iran, Israel, Kuwait, Jordan, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia and United Arab Emirates). The period of study is from 1975 to 2012. A common practice in the growth literature is to use a 5-year non-overlapping average data to account for the business-cycle fluctuations if there were any. This averaging of the data also deals with the missing data problem that is usually prevalent in developing countries. Therefore, we have eight observations for each country: 1975-1979, 1980-1984, 1985-1989, 1990-1994, 1995-1999, 2000-2004, 2005-2009 and 2010-2012 (the last period includes an average of 3 years only). Most of the data set is obtained from the World Bank Indicators. Any data not available from this source were collected from the UNCTAD-STAT.

All variables except the growth rate of real GDP, inflation rates, DC, M2 and FDI are in the logarithm form⁶. The FDI data obtained from the World Bank Indicator is the net foreign direct investment and some of these values are negative (even after taking a 5 year average). Therefore, to avoid losing of any more values, we decided not to take the natural log of this variable. Inflation rate is

⁶ FDI variable is found to have a very high correlation with the interaction term ($\log(\text{DC}) \cdot \text{FDI}$ or $\log(\text{M2}) \cdot \text{FDI}$). Therefore, DC and M2 are employed without taking log to reduce this correlation.

based on the percentage change in CPI (if the data on CPI were not available, the GDP deflator was used to compute the inflation rate).

4.2. Results

The descriptive statistics of all variables used in this study are reported in Table 2, while Table 3 provides a correlation matrix of these variables (to conserve space the correlation matrix with DC is not reported here).

Table 2: Descriptive Statistics

Variable	Mean	Stan. Dev.	Minimum	Maximum	Observation
GDPCG	2.1811	3.8092	-11.088	16.254	112
DC	38.415	21.418	4.8777	89.847	112
M2	60.295	25.404	14.089	132.32	112
FDI	1.7349	2.2890	-1.2059	15.526	112
Trade	4.1447	0.4128	2.8047	5.1933	112
GE	2.9187	0.3594	1.9263	4.2864	112
I	3.1781	0.2188	2.6589	3.7551	112
Inf.	9.6684	18.932	-1.7299	177.53	112
IGDPC	8.7511	1.3631	6.2193	11.203	111
DC*FDI	84.688	160.14	-48.594	1326.54	112
M2*FDI	124.92	238.53	-61.888	2054.53	112

Note: Except the growth rate of GDP, FDI and inflation rate, all other variables are in logarithm form

Table 3: Correlation Matrix

	GDPCG	M2	FDI	M2*FDI	Trade	GE	I	Inf	IGDPC
GDPCG	1.000								
M2	0.081	1.000							
FDI	0.243	0.352	1.000						
M2*FDI	0.173	0.511	0.918	1.000					
Trade	0.158	0.004	0.342	0.257	1.000				
GE	0.035	0.177	-0.117	-0.117	0.037	1.000			
I	0.203	-0.208	0.088	0.088	0.073	-0.181	1.000		
Inf	-0.043	0.047	-0.136	-0.136	0.125	0.165	0.021	1.000	
IGDPC	0.034	-0.217	-0.021	-0.094	0.514	-0.223	0.058	-0.088	1.000

Table 3 reveals a positive association between financial sector development and economic growth. In fact, the table indicates a positive association of economic growth with all but one variable, the inflation rate. However, the bivariate association shown in this table is to be analyzed with caution as it ignores the impact of all other variables on economic growth while examining the association between financial development and economic growth. It also ignores other issues such as, endogeneity of the regressors, and the direction of causation, etc.

Tables 4, 5, 6 & 7 provide results for the pooled OLS, fixed effects, random effect and the system GMM estimation methods, respectively. Due to the possibility of severe multicollinearity owing to strong correlation between FDI and interaction term, M2*FDI or DC*FDI (see Table 3 above) we report the following results (i) with only financial development and FDI variables included in the regression, (ii) with all variables included in regression, and finally, (iii) after dropping only the interaction term from regression.

Table 4: Results for the Pooled OLS Estimation

Variables	M2 & FDI only	M2 (All)	M2 (Ex. Interaction)	DC & FDI only	DC (All)	DC (Ex. Interaction)
IGDPC		0.111 (0.759)	0.151 (0.676)		0.054 (0.872)	0.083 (0.807)
DC				-0.0126 (0.478)	0.008 (0.723)	-0.011 (0.564)
M2	-0.0008 (0.958)	0.02 (0.277)	0.008 (0.621)			
FDI	0.408* (0.015)	0.925** (0.035)	0.327*** (0.081)	0.448* (0.008)	1.139** (0.014)	0.401** (0.031)
FDI*DC					-0.0121*** (0.081)	
FDI*M2		-0.006 (0.131)				
Trade		0.294 (0.794)	0.378 (0.738)		0.335 (0.77)	0.556 (0.629)
GE		0.974 (0.378)	0.815 (0.462)		1.293 (0.227)	1.058 (0.323)
I		3.747** (0.048)	3.811** (0.045)		3.098*** (0.091)	3.224*** (0.082)
Inf		-0.006 (0.77)	-0.005 (0.788)		-0.005 (0.787)	-0.003 (0.872)
Constant	1.520*** (0.098)	-16.716** (0.034)	-16.233** (0.04)	1.887** (0.011)	-14.507** (0.05)	-14.426*** (0.054)
Observations	112	111	111	112	111	111
R-Squared	0.0592	0.1273	0.1074	0.0635	0.1345	0.1082

Figures in parenthesis are p-values; ‘*’, ‘**’, ‘***’ show significance at 1%, 5%, and at 10% level of significance, respectively.

Table 4 shows the results of the pooled OLS estimation. It demonstrates that financial development (as measured by money supply as a percentage of GDP, or domestic credit as a percentage of GDP) does not contribute to the economic growth of the MENA region. The coefficient of the financial development is not only insignificant, its sign is inconsistent. However, the level of FDI contributes positively to the economic growth of the MENA countries. The interaction term, on the other hand, is statistically significant only at a 10% level of significance when the DC variable is used. Table 4 also reveals that the trade openness and government expenditures variables do not contribute significantly to the economic growth, while gross fixed capital formation as a percentage of GDP has a positive and significant influence on the economic growth of the region. The results presented in this table also shows that the log of the “initial GDP per capita” has an insignificant effect on economic growth; thus it rejects the convergence effect which implies that the less developed countries do not grow at a higher rate than the developed countries. The above table does not find however, any significant impact of inflation rate on the growth of the MENA countries, but the sign of this coefficient is found to be negative as expected.

Table 5 below provides the results for the fixed effect estimation approach. The results of the fixed estimation method support the findings of the pooled OLS estimation technique that the financial sector development does not contribute to the economic growth of the region. However, the sign of this variable is found to be consistently negative. The FDI variable has a significantly positive impact on the economic growth (the effect becomes insignificant only when the interaction term is included in the regression. This may be attributed to high multicollinearity between FDI and the interaction term). Similarly, fixed capital formation contributes positively to the economic growth of the region while trade openness, the interaction term and government expenditures continue to have no influence on the growth of this region. Government expenditures show an insignificantly negative impact. Additionally, the inflation rate also shows an

insignificantly negative effect on economic growth. Results based on the F-restricted test indicate the presence of a fixed effect, thus confirming the heterogeneity of the MENA countries.

The results of the random effect estimation approach are shown in table 6 below. The results presented in Table 6 are supportive to the results obtained earlier in Tables 4 & 5 above, reinforcing the previous findings that financial development plays no role in the economic growth of MENA countries, while FDI contributes positively, and the interaction term does not contribute to growth. Fixed capital formation continues to exhibit positive influence on the growth of MENA countries. The LM-test confirms the presence of the random effect. The Hausman test however, indicates that the random effect estimation approach is more appropriate than the fixed effect estimation. Therefore, given the LM test and Hausman test, the results based on the random effect estimation are more reliable than the pooled OLS and the fixed estimation methods. In other words, the random effect estimation provides the most appropriate estimates for the static panel data in this study.

Table 5: Results for Fixed Effect Estimation

Variables	M2 & FDI only	M2 (All)	M2 (Excl. Interaction)	DC & FDI only	DC (All)	DC (Ex. Interaction)
IGDPC		0.506 (0.333)	0.549 (0.288)		0.607 (0.235)	0.619 (0.225)
DC				-0.04 (0.103)	-0.03 (0.243)	-0.036 (0.141)
M2	-0.037 (0.089)***	-0.013 (0.547)	-0.015 (0.489)			
FDI	0.433* (0.01)	0.597 (0.17)	0.315*** (0.075)	0.428** (0.011)	0.636 (0.158)	0.341** (0.045)
FDI*DC					-0.004 (0.477)	
FDI*M2		-0.003 (0.477)				
Trade		0.232 (0.893)	0.155 (0.928)		0.024 (0.989)	0.077 (0.964)
GE		-0.857 (0.527)	-1.029 (0.44)		-1.474 (0.26)	-1.571 (0.226)
I		6.356* (0.002)	6.609* (0.001)		6.192* (0.002)	6.414* (0.001)
Inf		-0.003 (0.865)	-0.003 (0.876)		-0.006 (0.762)	-0.004 (0.814)
Constant	3.675* (0.005)	-20.71** (0.056)	-20.844** (0.053)	2.985* (0.002)	-18.07*** (0.095)	-18.494*** (0.086)
Observations	112	111	111	112	111	111
R-Squared	0.0733	0.1951	0.1905	0.0711	0.2102	0.2057
F-Restricted	3.34*	3.85*	4.08*	3.27*	3.96*	4.28*

Figures in parenthesis are p-values. F-restricted provides test for the presence/absence of the fixed effects; *, **, *** show significance at 1%, 5%, and at 10% level of significance, respectively.

Table 6: Results for Random Effect Estimation

Variables	M2 & FDI only	M2 (All)	M2 (Ex. Interaction)	DC & FDI only	DC (All)	DC (Ex. Interaction)
IGDPC		0.3367 (0.424)	0.414 (0.329)		0.445 (0.283)	0.459 (0.266)
DC				-0.026 (0.2)	-0.015 (0.499)	-0.024 (0.271)
M2	-0.017 (0.314)	0.0005 (0.981)	-0.005 (0.788)			
FDI	0.414* (0.009)	0.665 (0.107)	0.317*** (0.061)	0.429* (0.007)	0.741*** (0.085)	0.353** (0.03)

Variables	M2 & FDI only	M2 (All)	M2 (Ex. Interaction)	DC & FDI only	DC (All)	DC (Ex. Interaction)
FDI*DC					-0.006 (0.33)	
FDI*M2		-0.004 (0.355)				
Trade		0.277 (0.835)	0.232 (0.864)		0.258 (0.85)	0.349 (0.797)
GE		-0.228 (0.848)	-0.505 (0.671)		-0.556 (0.629)	-0.663 (0.562)
I		5.518* (0.003)	5.911* (0.001)		5.398* (0.003)	5.617* (0.002)
Inf		-0.002 (0.901)	-0.002 (0.907)		-0.004 (0.825)	-0.002 (0.893)
Constant	2.543** (0.029)	-19.477** (0.024)	-19.935** (0.023)	2.452* (0.01)	-18.43** (0.032)	-18.88** (0.028)
Observations	112	111	111	112	111	111
R-Squared	0.0654	0.1863	0.1854	0.0676	0.2034	0.1996
LM –Test	13.93*	15.27*	18.66*	14.88*	15.30*	19.54*
Hausman Test	2.54	7.62	4.04	1.34	4.76	4.79
Hausman Test	(0.2806)	(0.4713)	(0.7751)	(0.5129)	(0.7824)	(0.6859)
P-value						

Figures in parenthesis are p-values; ‘*’, ‘**’, ‘***’ show significance at 1%, 5%, and at 10% level of significance, respectively.

Table 7: Results for System GMM

Variables	M2 & FDI only	M2 (All)	M2 (Ex. Interaction)	DC & FDI only	DC (All)	DC (Ex. Interaction)
IGDPC		0.391 (0.471)	0.529 (0.32)		0.475 (0.35)	0.545 (0.281)
DC				0.0002 (0.991)	0.0219 (0.357)	0.006 (0.799)
M2	-0.0175 (0.364)	-0.0008 (0.97)	-0.0111 (0.591)			
FDI	0.368* (0.008)	1.145* (0.003)	0.467* (0.003)	0.406* (0.006)	1.206* (0.003)	0.448* (0.005)
FDI*DC					-0.012** (0.043)	
FDI*M2		-0.007*** (0.054)				
Trade		0.184 (0.905)	0.212 (0.889)		0.972 (0.538)	1.207 (0.443)
GE		0.369 (0.755)	0.148 (0.899)		1.059 (0.371)	0.854 (0.468)
I		1.724 (0.42)	2.257 (0.286)		3.916*** (0.058)	4.288** (0.037)
Inf		-0.0003 (0.985)	0.0003 (0.987)		0.0014 (0.939)	0.006 (0.745)
Constant	2.057*** (0.095)	-10.142 (0.262)	-11.631 (0.197)	0.776 (0.406)	-23.986* (0.008)	-25.303* (0.005)
Observations	98	98	98	98	98	98
Wald-Stat	13.25*	28.69*	25.50*	17.00*	39.71*	35.82*
P-value (Wald)	(0.0041)	(0.0007)	(0.0013)	(0.0007)	0	0
Sargent Test						
P-value	(0.6898)	(0.206)	(0.1131)	(0.6984)	(0.2046)	(0.1309)
AR(2)						
P-value	(0.3233)	(0.4228)	(0.3577)	(0.3356)	(0.4168)	(0.3817)

Figures in parenthesis are p-values; ‘*’, ‘**’, ‘***’ show significance at 1%, 5%, and at 10% level of significance, respectively.

The three estimation approaches as discussed above in tables 4, 5 & 6 do not take into account the endogeneity of the regressors. The system GMM is used to deal with this problem. Table 7 above shows the results of the dynamic panel data using the system GMM estimation approach. The system GMM provides consistent estimates if the model specifications pass through the tests of instruments validity and serial correlation.

Both the Sargent test and autocorrelation test confirm the appropriateness of the model. The null hypothesis of the valid instruments could not be rejected, and the second-order autocorrelation test indicates the absence of any serial correlation in the first-differenced residuals.

Results of Table 7 above support the key results of Tables 4, 5 and 6 shown earlier (i.e., the estimation results of the pooled OLS, fixed effect and the random effect regression models, respectively) that the financial sector development plays no role in the economic growth of the MENA region. Additionally, FDI variable contributes positively to the growth of the region. However, the results of the system GMM suggest that the interaction of the financial development and FDI have contributed negatively to the economic growth of these countries during the study period, 1975 to 2012. Further, fixed capital formation positively affects the economic growth of the MENA countries, while trade openness and government expenditures do not have any significantly positive impact on the economic growth there. Additionally, the inflation rate has a negative but insignificant influence on the economic growth.

The effect of government expenditure on economic growth is found to be insignificant in all four estimation methods. The sign is consistently positive in all models under the system GMM approach. To be noted here that the system GMM approach is the most reliable approach among all four approaches employed in this study. The insignificant impact of government expenditures on economic growth in MENA region may be associated with imprudent allocation of government funds in various economic sectors of this diverse economic region due to asymmetric nature of administrative system and capacity across 14 MENA countries in the sample. Besides, the existence of different political system, ideology and state of governance (some are with autocratic power with little or no democratic process in governance, Kingship, and military government) might lead to, on average, an insignificant impact of government expenditures on economic growth in MENA.

In summary, the present study presents a compelling case and evidence that FSD in the MENA countries do not have any effect on the economic growth over the sample period: 1975-2012. This finding is robust to all four estimation methods employed in the study. The results contradict however, the findings of some influential studies in the literature that found a positive effect of FSD on economic growth (for instance, King and Levine (1993a, b), Levine and Zervos (1996), Levine (1997), Beck et al. (2000) and Levine et al. (2000)).

The results also contradict several other studies on the MENA and GCC countries, and any specific MENA country study. These studies are: Ghali (1999), Al-Awad & Harb (2005), Abu-Bader and Abu-Qarn (2008), Balamouni-Lutz (2008), Raschdi & Mbarek (2011), Hassan KM et al. (2011), Malkawi and Nazirudin (2011), Manizleh Falahaty & Law Siong Hook (2013), Sbeiti et al. (2013), Ibrahim (2013) and Marshdeh and Malkawi (2014). The above studies found a positive effect of FSD on economic growth. Appendix 1 briefly describes the results of these studies.

The present study finds its supports in the following studies of MENA, and other specific MENA country. The studies are: Bolbol et al. (2005), Ben Naceur & Ghazouni (2007), Ben Naceur et al. (2008), Goaid & Sassi (2010), Ayadi et al. (2013), Achy (2005), Grassa & Gazdar (2014), Mosesov and Sahawneh (2005), and Malkawi et al. (2012). The brief results of these studies are shown in appendix 1.

Al-Tamimi et al. (2002) found a strong linkage between FSD and economic growth in the long run, but with no over all clear evidence of FSD impacting economic growth. Boulila and Trabelsi (2004) found little evidence of finance as a leading factor in the determination of long run economic growth of the MENA region (For more see, appendix 1).

A good number of factors are identified with empirical evidences to explain why our results are different from those of the pioneering works and several other MENA studies. The sample MENA

countries in present study vary substantially on average, separated by 8 sub-periods: 1975-79; 1980-84; 1985-89; 1990-94; 1995-1999; 2000-04; 2005-09; and 2010-12 in the level and intensity of FSD during the sample period. Summary results are shown in appendix 2 with a graphic description in Figure 1.

Some sample MENA countries in the present study demonstrate a variation in *comprehensive index of financial development constructed by* Creane et al. (2004). This study found few MENA countries with a very high financial development index (**fdi**): they are Lebanon, Jordan, Kuwait, United Arab Emirates and Saudi Arabia during 2000/01 to 2002/03 followed by MENA countries with medium **fdi**: the countries are Qatar and Egypt. Then the countries with low **fdi** are Tunisia, Morocco, and Algeria, and finally, the countries with very low **fdi** are Iran and Syria. The study found that the countries with high **fdi** received high marks for regulation, supervision and financial openness (ibid. 2004, p. 8).

MENA countries experienced several decades of financial deepening showing its importance in the economy with a significant increase in bank lending since 2000. While the rate of credit expansion⁷ to private sector surpassed the growth rate of real economy, there was however, a serious ups and down⁸ (Barajas and Chami, p. 22, 2013). The recovery from the boom-bust cycles in MENA countries was not complete. Barajas and Chami (2013) quote the prediction of Barajas et al. (2011) (after the latter assessing the behavior of boom-bust cycles in credit growth) and state that a minimum of 3 years or more would be required to ascertain the normal credit growth in MENA countries. Further, quoting the same study, Barajas and Chami (2013) shared the views that while the financial depth in banking (ratio of private credit to GDP) and in stock market (market turnover or ratio of value added to GDP) in MENA showed a surpass of the emerging markets, and developing countries, there was a caveat however, underneath this average performance, and that was related to a considerable variation of financial depth across the MENA regions. For example, the ratio of private sector credit to GDP was 78% in Jordan in 2009: this was 8 times the level in Libya; in Saudi Arabia, the stock market turnover was 199%: 11 times the level in Lebanon (ibid. p. 24, 2013).

Based on structural bench-marks estimated as of 2009 by the World Bank, the average credit to GDP ratio was 48% in MENA countries, and stock market turnover was 45%; some

Individual MENA countries were outperforming, while some others were underperforming of their respective structural benchmarks. As a whole, the MENA banking systems underperformed; it was more noticeable in non-GCC MENA countries with respect to credit-deposit ratio. This is because the countries were unable to effectively convert the deposit funds into private sector loans. The intermediation of deposit funds by banks in private sector credit was not impressive; on average, the credit deposit ratio in MENA countries was 18% points below its structural benchmarks, while the same ratio in non-GCC MENA countries was 40% points below the benchmark. The reasons were high public borrowing mostly in later countries from the bank. In Algeria, the bank lending to public sector was almost 50% more than that of private sector when the same lending in Syria and Egypt was 20% on average. The banking system in MENA lent approximately, 13% of GDP to Government and state-owned enterprises (ibid., p. 24, 2013). The frequency of the banking system to invest the deposit funds in abroad and in domestic government bonds and securities was higher than the increase in private credit for one to one with every additional amount deposited in the banking system of MENA (Al-Hussainy et al. 2011). Evidence suggests that the available bank credits tend to be concentrated highly to favor few large and established firms, while those smaller and young businesses who contributed relatively more to creating jobs, relied on limited internal finance or other informal financial sources. The use of bank loan by the population of MENA countries as a whole, falls short of other countries with similar private sector credit to GDP (Barajas and Chami, p. 25, 2013).

Besides, other features of MENA countries relate to the limited development of secondary market that hinders the use of open market operations smoothly by their central banks. The banking

⁷ While there was a credit boom in eight MENA countries surpassing the historical trend by an extra ordinary margin, MENA experienced a generalized boom as a whole.

⁸ Credit growth in Bahrain, while peaking up at over 26% in mid 2008, went down to over 4% by Quarter 1, 2010; in Jordan it plunged: it grew faster than 14% in 2008 and then contracted by 2% in Quarter 1, 2010

sector was dominated by public banks; they lacked good governance, and were unable to effectively select projects that improved the economic growth of the region. These banks were characterized by regular government intervention in credit allocation with losses and liquidity problems, and accompanying wide interest rate spreads.

As the required quality in the institutional framework and financial instruments was not ensured during the sample period, the private firms and agents in the MENA countries encountered difficulties to access the diversity of financial instruments to ensure long term capital need. Consequently, financial intermediaries and banking system were unable to efficiently channel the domestic savings into productive investment necessary for economic growth. As the *comprehensive financial index parameters differed* substantially across the MENA region, it lacked full support on average to make the process of financial innovation successful with improved institutional and organizational set up of the financial system. This failed to ensure a reduction in asymmetric information to make the financial market complete. Had the above financial index parameters been not so different, this would otherwise have reduced unnecessary transactions costs to enable the explicit and implicit contracts easy for the firms and agents during the sample period? All these facts and reasoning seem to have nullified the positive role of FSD on economic growth not only in the present study, but also elsewhere, in other previous MENA studies.

The asymmetric level and degree of banking efficiency in MENA countries is also self evident from Ben Naceur et al. (2011). They examined the effect of institutional development, financial structure and bank-specific characteristics on the performance and efficiency of the banking sector in five MENA countries, Egypt, Morocco, Jordan, Lebanon & Tunisia. While all these countries shared similarities in economic structure⁹, they found the efficiency levels of banks varying substantially among these countries, even though they all started with similar financial reform process individually. Differences in technology across these countries were identified as the main reason to explain the variation in bank efficiency. Ben Naceur et al.'s (2011) study conveys the message that the likelihood of a far more variation in banking efficiencies would not be a remote possibility among all MENA countries (particularly in sample MENA countries of the present study), as they are usually non-similar from each other in their respective economic structure, and in particular, when each MENA country started with dissimilar financial reform process with different financial intensities and momentum. All these factors and realities are strong evidences to bring upon necessary stakes for otherwise findings than a priori on the finance-growth nexus of the present study with 14 MENA countries.

To be noted here that a good number of MENA studies¹⁰ strongly are in favor of continued financial reform process with a diversification of the financial system, and a reform of the stock market and banking sector to stimulate savings and investment. Their observations are no different than the present study. Ben Naceur & Ghazouni (2007) alleged the underdeveloped financial systems in the MENA region for hampering the economic growth in MENA. They strongly suggested for reinforcement of the institutional environment to improve the functioning of the banking sector. Balamoune-Lutz (2008) found mixed results due to differences in the banking regulation and supervision across the MENA countries. Manizleh Falahaty & Law Siong Hook (2013), after finding the impact of the banking sector less apparent on economic growth¹¹, suggested for an improvement of the banking sector to manage efficiently, and effectively the financial instruments for their impact on economic growth. Hassan KM et al. (2011) concluded that any financial reform process to deepen the financial system in the MENA region to eventually impact upon their economic growth, must accompany with policies to provide necessary incentives to promote trade in the region. Boulila and Trabelsi (2004) found little evidence of FSD as a leading factor to the determination of long term economic growth for 16 MENA regions for the period 1960-2002. They identified four key reasons for this to happen: they are financial repression, high level of non-performing loans, failure to make timely

⁹ in the order of implementing the structural adjustment programs, in liberalization of the state-owned companies, attracting FDIs and resource scarcity in relation to population

¹⁰ irrespective of supporting or contradicting our results

¹¹ unlike the stock market measures

financial reforms, and finally, high transaction costs, all hampering the effective financial deepening of the MENA region.

Further, our finding is more reliable in supporting or even contradicting few earlier studies due to the following reasons,

- (i) This study uses the most recent data (from 1975 to 2012). Most of the financial developments in the MENA region have taken place during the last 15 to 20 years. Our results therefore, have taken into account of these latest financial developments and their impact on the economic growth of the MENA countries;
- (ii) Present study employed four estimation techniques including the system GMM approach that takes into account the endogeneity of regressors unlike other studies (the study has employed both the static and the dynamic panel data);
- (iii) The study employed a large number of control variables (including FDI and the interaction of FDI and financial development). Other studies may have suffered from omitting relevant variable problem (specifically our study found FDI to be statistically significant in affecting the economic growth);
- (iv) Unlike other studies on MENA, this study has taken 5-year averages to smooth out the business cycle fluctuations. More likely than NOT those other studies, might have suffered from business cycle fluctuations.

Our results also suggest that FDI contributes positively to the economic growth. The interaction of FSD and FDI do not contribute to the growth of the MENA countries based on the three estimation methods (static panel data). This could be due to the reasons that FSD in the region was not strong enough to attract FDI during the study period, and hence an insignificant impact of the interaction term on economic growth, is not unlikely. This result contradicts the findings of Omran and Bobol (2003). They found a positive effect of the interaction term on economic growth. They examined the interactive role of FDI and FSD in impacting economic growth. Using bank-based and equity market indicators with FDI as interaction terms, they found that FDI affected economic growth positively at a given threshold level of FSD in host Arab countries inclusive of GCC countries. Comparing their results with ours, it may be asserted that the threshold level of FSD was not well established in the sample MENA region during the study period, for the FDI flows and operations, to be effectively embedded with FSD to promote economic growth in these sample MENA countries.

Fixed capital formation has contributed positively to the region's economic growth during the sample period of our study. Additionally, during the same period, trade openness and government expenditures have shown no impact on the economic growth. The above results also suggest that inflation rate has played a negative role in the region's economic growth. However, this effect is insignificant during the study period. Additionally, the study shows that initial GDP per capita has an insignificant impact on economic growth. This implies that a low level of initial GDP per capita is not associated with a higher growth rate in the MENA region.

5. Conclusions and Policy Implications

Given several econometric studies conducted on the finance-growth nexus of the MENA region, very few studies have systematically explored this for the MENA countries, like the present one. The present study has investigated whether FSD contributed positively to the economic growth of the MENA countries during the sample period 1975 to 2012. Additionally, the study has explored whether FDI played any role in the economic growth of the region, and whether FSD of these countries are strong enough to attract FDI, and consequently, the joint influence of FSD & FDI combined is positive to the growth of the sample MENA countries.

Two indicators of FSD are commonly used in the literature. They are money supply (M2), as a ratio of GDP, and domestic credit (DC) provided by the banks to the private sector as a ratio of GDP. This study has used four estimation techniques to estimate the empirical model. This includes, Pooled OLS, fixed effect estimation, random effect estimation and the system GMM estimation approaches.

All four estimation approaches provided the evidence that FSD do not contribute to the economic growth of the MENA region.

The study results also indicate that foreign direct investment contributes positively to the economic growth of the MENA countries during the study period. However, this region does not benefit from the joint influence of financial development and FDI. Additionally, fixed capital formation is an important contributing factor to the economic growth of this region. But trade openness and the government expenditures show no impact on the economic growth of the MENA countries during the study period.

Given the backdrop of many factors leading to otherwise performances on the finance-growth nexus, the study recommends that the government of the MENA countries individually must implement the ongoing financial sector reforms with good supervision, monitoring and evaluation to maintain the assured & secured level of quality governance of the financial institutions, so that the financial intermediaries and banking sectors are able to efficiently and effectively channel the domestic savings into productive investment; they are able to ensure private firms to feel comfortable to access the diversity of financial instruments with greater ease. Along with the required financial deepening across MENA countries, there is a need for inclusive financial deepening, such as removal of barriers and entry, interest and credit controls, direct state ownership of banks and pressure to finance government programs. To bring improvement in financial intermediation, strengthening of legal protection of creditor and small share holder rights is mandatory. Finally, they are able to bring the required financial innovation to reduce the asymmetry in information gathering and analysis to reduce the transaction and other associated costs to make the financial market complete and competitive.

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Appendix 1

Summary of Econometric Studies on the Relationship between FSD and Economic Growth in the MENA Region, Southern and Eastern Mediterranean (SEMCs) Countries, the GCC Countries and Few Other Specific Arab Countries

Authors & Year of Publications	Econometric Techniques Used	Countries & Period of Study	Findings & Observations
Studies found positive impact:			
Ghali (1999)	Granger Causality Tests on Time Series Data	Tunisia Study period: 1963-93	He found a long term stable dynamic relationship between economic growth and financial development. In his study, he used the ratio of bank deposit liabilities to GDP and ratio of bank claims on private sector to nominal GDP and employed four measures of financial development: (i) ratio of money to GDP, (ii) ratio of M2 minus currency to GDP, (iii) ratio of bank credit to private sector to GDP, and finally, (iv) ratio of credit issued to private sector to total domestic credit.
Al-Awad & Harb (2005)	Panel Co integration approach	10 MENA countries. Period: 1969- 2000	Found a long run relationship between FSD and economic growth but with weak causality in short run.
Abu-Bader and Abu-Qarn (2008)	Used Trivariate VAR Framework on Time Series Data	Egypt Period: 1960- 2001	They found a bi-directional causality and the impact of financial development to economic growth is through both investment and efficiency.
Baliamoune-Lutz (2008)	Used co-integration and	Algeria, Egypt and Morocco Period: 1960-	Studied the short run dynamics and long run relationship between real output and financial

	VECM models	2001.	development; found a stable long run relationship only when the ratio of liquid liabilities to GDP is used as this ratio simultaneously, helped adjust the short run output fluctuation to equilibrium output; mixed results were linked to differences in banking regulation and supervision.
Raschdi & Mbarek (2011)	Panel Data Analysis; Used Error Correction Model	6 countries from the OECD region 4 countries from the MENA region; Period: 1990-2006	Found a long run relationship between FSD and economic growth with causal effect from economic growth to FSD. The study also observed that financial markets shined when the economic growth process induced an increasing demand for financial services, leading to FSD. Causality was bidirectional for the OECD countries & unidirectional for the MENA region.
Hassan KM et al. (2011)	Panel Regressions and Variance Decomposition of Annual GDP Per capita Growth rates low and middle income countries classified by geographic regions including MENA regions	Low and Middle income countries classified by geographic regions; also 18 MENA regions (inclusive of all GCC countries).Period: 1980-2007.	Positive relationship between FSD and economic growth for developing countries only. Short term multivariate analysis showed mixed results of two way causation for most regions and one way causation only for two poorest countries in the sample. For MENA region, domestic credit to private sector (DCPS) and gross domestic savings (GDS) explained the variation in economic growth in MENA countries, respectively, by 1.7% and 0.5% compared to that of real sector; any shock on DCPS caused economic growth to rise rapidly in MENA countries and then died down after 4 years (Fig 1 and p. 97). Trade sector demonstrated high proportional variation in economic growth in MENA region and it GRANGER caused growth, a critical variable is identified in the study. The study concluded that any reform process to deepen the financial system in MENA region to impact on the growth must accompany with policies to provide incentives to promote trade in the MENA region.
Malkawi & Naziruddin (2011)	Pooled OLS, Fixed & Random Effects Model with Instrumental variables	13 MENA countries; Period: 1985-2005	Found a positive relationship between FSD and economic growth
Manizleh Falahaty & Law Siong Hook (2013)	Fully Modified OLS and Dynamic OLS	9 MENA countries Period: 1991-2009	Found FSD (inclusive of bank-based and market based measures) as the statistically significant determinant of economic growth; impact was more apparent with stock market development than banking sector; stressed the need to improve the functioning of the banking sector to efficiently manage financial instruments for their effective usage towards economic growth
Sbeiti et al. (2013)	Applied Fixed effect/Random effect Technique	GCC countries (except Qatar) Period: 1974 - 2003	Found a positive impact of both market based and bank based financial measures on economic growth.
Ibrahim (2013)	Used a Fully Modified OLS Approach	Kingdom of Saudi Arabia Period: 1989 - 2008	He found that domestic credit significantly & positively impacted on economic growth in the long run with insignificant negative impact in short run; there was an insignificant positive impact of stock market development on economic growth in the long run but an insignificant negative impact in the short run.
Marashdeh and Malkawi (2014)	Applied an ARDL approach	Kingdom of Saudi Arabia Period: 1970 - 2010	They examined the long run impact of financial deepening on the economic growth and found a positive and statistically significant impact of financial depth on economic growth with no short

			run bidirectional relationship between these variables: financial depth and economic growth.
Studies found negative impact			
Bolbol et al. (2005)		Egypt Period: 1974-2002	They studied the relationship between financial structure and total factor productivity (TFP) and found a negative impact of bank based indicators on TFP unless these indicators are interacted with per capita income while market based indicators had a positive impact. Their paper suggested diversification of financial system with a reform of stock market to enhance TFP in Egypt.
Ben Naceur & Ghazouni (2007)	Dynamic Panel Model with GMM Estimators	11 MENA countries Period: 1979- 2003.	No significant relationship between banking and stock market development; Negative association between bank development and economic growth after controlling stock market development. Lack of relationship due to underdeveloped financial systems in the MENA region hampering economic growth; suggested reinforcement of institutional environment to improve functioning of the banking sector.
Ben Naceur et al. (2008)	Dynamic GMM Regression	11 MENA countries, Period: 1979-2005	They found that stock market liberalization had no effect on investment and growth; the impact on stock market development is negative in the short run but becomes positive in the long run.
Goaied & Sassi (2010)	Used Dynamic Panel Data and Panel System GMM Procedure (one step sys-GMM and two step sys-GMM)	16 MENA Countries Period: 1962 - 2006	Found no significant relationship between banking sector development and economic growth; the effect was negative and significant affecting economic growth. The study found deficiencies in financial sector development as a means to private sector development and the economic growth at large, due to financial depression and financial instability in MENA region (p. 19).
Achy (2005)	Used panel GLS regressions	Five MENA countries; Period: 1970- 1997	Found the coefficients of financial development and financial liberalization negative implying a negative impact on private investment. After controlling for private investment, human capital, and policy related variables in terms of trade openness, inflation rate, and the burden of external debt, the study did not find any impact of financial indicators on economic growth. The paper identified distortions in financial liberalization policies in favor of consumption for these five MENA countries.
Grassa & Gazdar (2014)	Used OLS, Panel data and GLS Techniques	GCC countries (except Oman) Period: 1996 - 2011	Found that overall FSD did not affect the economic growth in the GCC countries: Conventional banking sector negatively affected the economic growth insignificantly, while Islamic banking sector development affected the growth positively and significantly.
Mosesov and Sahawneh (2005)	Used a standard OLS estimation	UAE Period: 1973-2003.	M2 variable impacted economic growth negatively with statistical significance (without oil prices in regression) while with insignificant negative impact (with oil prices); they found the negative impact of credit to private sector on growth with statistical significance, but a positive effect of domestic assets of resident banks with no statistical significance on GDP.
Malkawi et al. (2012)	Used ARDL Approach to Co-integration	UAE Period: 1974-2008	Found the measures of FSD to impact negatively to economic growth with statistical significance. They did not find either the demand followed or supply-led hypothesis to finance-growth nexus in UAE. sector as percentage of

Studies found weak or no impact			
Al-Tamimi et al. (2002)	Granger Causality Tests and Impulse Functions	Selected Arab Countries Used different period for different countries	Found strong linkage between FSD and economic growth in the long run; Granger Causality Tests and Impulse Functions show weak linkage in short run; over all, no clear evidence of FSD and economic growth
Boulila and Trabelsi (2004)	Applied Co-integration techniques and Granger causality tests	16 MENA countries; Period: 1960- 2002	Found that causality ran from real sector economic growth to financial sector; there is little evidence demonstrating finance, as a leading factor in the determination of long term growth in MENA region. The study made following observations: The reasons for above findings are: (i) financial repression, (ii) high level of non-performing loans, (iii) failure to make timely financial reforms and finally, (iv) high transaction costs hampering effective financial deepening.
Arcand et al. (2012)	Various Econometric Techniques: Cross Country OLS; Semi-Parametric Regressions; and GMM System Estimator	Used Different Data Sets: 1960-1995; 1960-2000; 1960-2010;	Studied the (i) relationship between financial depth and economic growth using country-level data; (ii) role of volatility, crises, institutional quality, and bank regulation and supervision; and (iii) non-linearities using industry-level data. It investigates the threshold level of financial development beyond which any further development brought detrimental impact on growth: found the relationship between financial depth & economic growth disappeared in countries with a very large financial sector; credit to private sector above 80-100% of GDP negatively affected economic growth due to: (i) excessive credit growth leading to high economic volatility & creating financial crisis, and (ii) high credit volume, an indication of potential resource misallocation.

Appendix 2: Features of MENA countries in the Sample with respect to M2 and DC information

MENA country	M2 as a percentage of GDP	DC: Private Credit provided by Commercial Banks as a percentage of GDP
Algeria	75% in late 80s and then fell almost to 60% during 2010-2012.	It was almost 65% of GDP in late 80s and then fell significantly to 15% approximately during 2010-2012.
Egypt	80% and above throughout the sample period	The lowest value was below 20% of GDP ; then a large variation is evident with approx. 55% , the peak value in the early 2000s, and then declined to 50% ,and then to 30% during 2010-2012.
Israel	120% in early 90s and then went down to approx. 60% of GDP; there was a gradual increase initially and then a gradual decline throughout the sample period.	60% or below of GDP during 2010-2012 period with lowest vale of 25% approx; wide variation is observed with upward trend after 90s and 00s
Jordon	Above 100% of GDP throughout the sample period reaching 120% or above in the 1990s and 00s	60% or above of GDP throughout the sample period with peak of above 80% approx. during 2005-2009 and a little lower afterwards but above 70%.
Morocco	Substantial increase from as low as 40% of GDP to above 100% in later years during the sample period.	Sustained increase from below 20% of GDP to almost 70% approx. during the sample period.

Syria	All through remained stable, attained above 60% in 00s and onwards.	It was below 10% of GDP during 1975-1979; remained below 20% throughout the sample period.
Tunisia	Remained above 40% of GDP throughout with an upward trend reaching the peak value of approx. 65% during 2010-2012.	Always above 40% of GDP; exceptionally, the DC value was consistently higher than M2 value throughout the sample period with a peak value 70% approx. during 2010-2012.
Iran	Started with 40% of GDP during 1975-1979 and then gradually increased and remained above 55% during 80s and then continuously declined and went down even below 15% during 2010-2012.	It was below 25% of GDP in early years and then stabilized with peak value just over 35% during 2005-2009 and then dropped to 12% approx during 2010-2012.
Bahrain	Stable over 60% of GDP; attained 80% approx. during 2010-2012.	DC value was higher than 60% of GDP only during 2010-2012; in other periods, it was below 40%.
Kuwait	It was above 100% of GDP in early 90s and then fell approx. to 55% during 2010-2012; the distribution was apparently normal	There were ups and down with peak value above 50% of GDP in the early 1990s and mid 90s
Oman	There was a gradual increase of both M2 and DC but DC exceeding M2; M2 was always below 40% of GDP	It was 40% of GDP during 2010-2012 and in other years it was below 40%
Qatar	Mostly stable and remained above 50% of GDP approx during the sample period	In earlier period it was in 10% - 15% range of GDP ; then increased to 40% of GDP and above in late 80s and early 90s, and then declined to below 40%, and subsequently, stabilized at 40% during 2010-2012.
Saudi Arabia	Stable and remained mostly above 40% of GDP after the 2000s... almost 50% approx.	Lowest ever approx. 5% or below of GDP during 1975-79, then attained almost 35% approx during 2010-2012.
United Arab Emirates	Below 20% of GDP during 1975-1979; gradually increased to almost 65% of GDP or above; used to be 30% or below in 00s and then reached 65% and above during 2010-2012.	It was around 15% of GDP and then a sustained increase to 65% by 2010-2012; before 00s it was 30% of GDP; the growth is seemingly exponential in later period.

Figure 1: Bar Diagram of M2, GDPCG, DC and FDI for MENA Countries. M2, DC & FDI are expressed as % of GDP

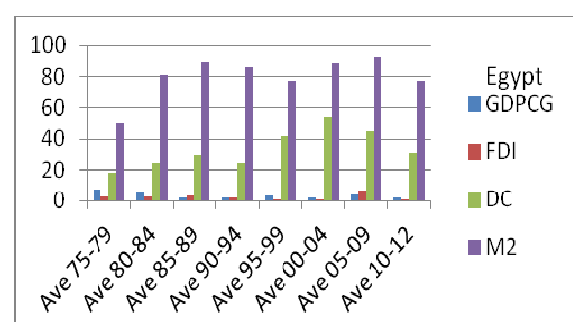
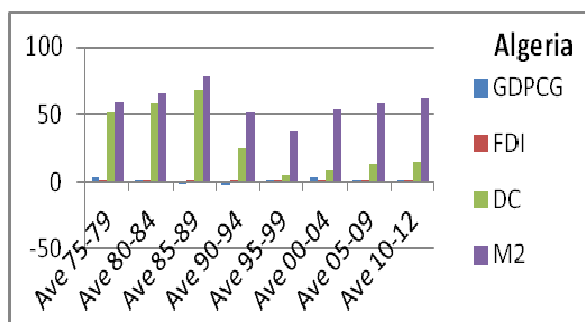
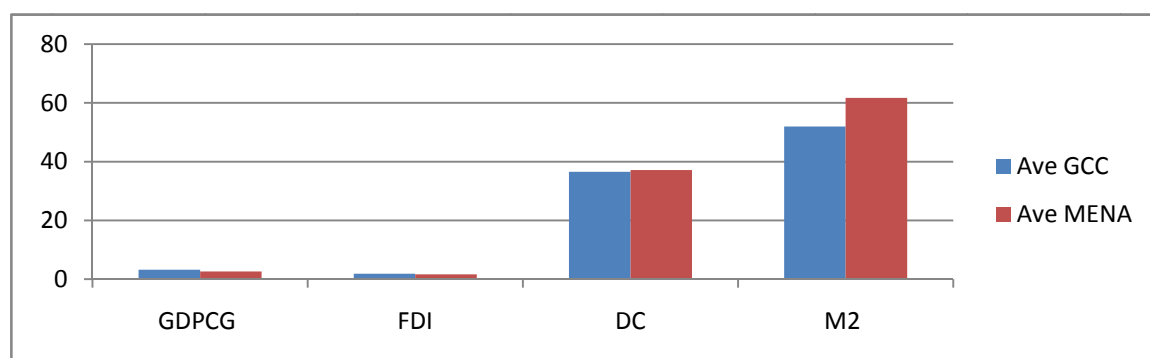


Figure 1: Bar Diagram of M2, GDPCG, DC and FDI for MENA Countries. M2, DC & FDI are expressed as % of GDP – cont.

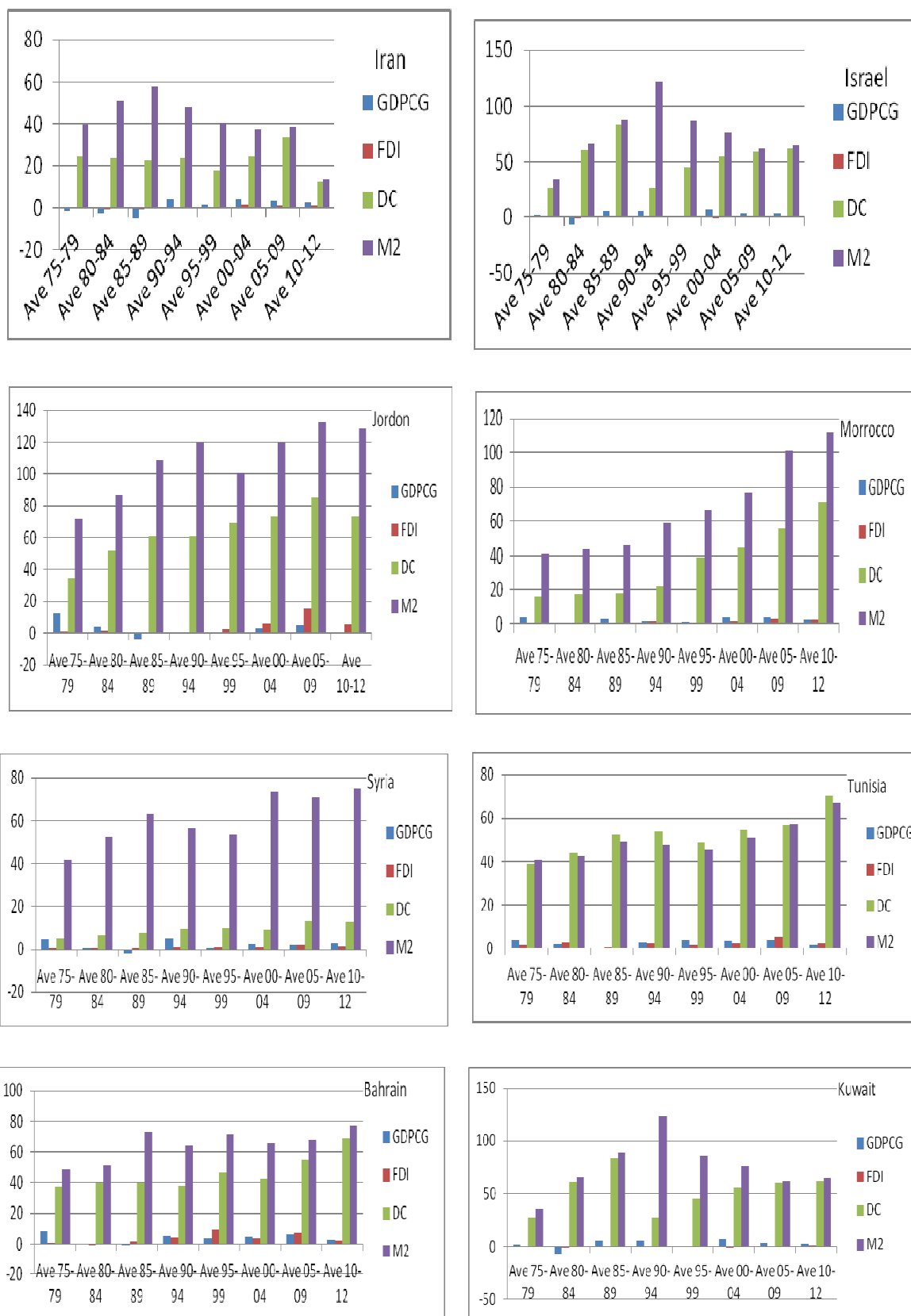


Figure 1: Bar Diagram of M2, GDPCG, DC and FDI for MENA Countries. M2, DC & FDI are expressed as % of GDP – cont.