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FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN THE MENA REGION

by
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AN ABSTRACT OF THE PROJECT

Amal Fadi El Rifai for Master of Arts in Financial Economics
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This project studies the relationship between financial development and economic growth in 19 countries in the MENA region over the period of 1980-2014. The paper provides empirical support that financial development affects economic growth negatively in the MENA region, notably when liquid liabilities, deposit money bank assets to deposit money bank assets and central bank assets, and private credit by deposit money banks to GDP are the financial development indicators. After a general introduction, Section 2 overviews the macroeconomy in the MENA region. Section 3 examines established growth theories followed by several empirical studies conducted around the world regarding this topic. Section 4 presents the empirical model conducted to study the effect of financial development on economic growth. Section 5 relays the results with a discussion of the analysis. Section 6 summarizes and concludes this paper.

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CHAPTER I

INTRODUCTION

Sources of economic growth are widely examined theoretically and empirically in economics. The Solow Growth model, an extension of the Harrod Domar exogenous growth theory, states that capital accumulation, labor population growth, and technological progress are exogenous factors leading to economic growth. Alternatively, the endogenous growth theory discusses technological improvement as an endogenous source of economic growth. The latter theory implies that financial development can increase economic growth. In fact, a well-developed financial system reduces information, transaction, and monitoring costs which enhances the efficiency of intermediation, promotes investment and leads to a more efficient allocation of resources, a more rapid accumulation of physical and human capital, and faster technological progress which in turn cause economic growth. Efficient financial system mobilizes savings, monitors performance of projects, enables risk diversification, and facilitates the exchange of goods and services (Creane, Goyal, Mobarak, & Sab, 2003).

Levine (1997) argues that financial functions can affect economic growth through two channels which are capital accumulation and technological innovation. In other words, mobilizing savings, allocating resources, exerting corporate control, facilitating risk management, and easing trading of goods, services, and contracts affect economic growth through the mentioned channels. For example, by mobilizing savings across a large number of investors, financial markets improve capital accumulation and enhance resource allocation which could be translated into technological progress. The

improvement of capital accumulation and technological innovation will affect economic growth. In fact, Levine argues that the financial sector improves transactions, lowers information costs, and eases credit constraints. Moreover, Demetriades and Andrianova (2003) state that financial development and economic growth depend on the management of information by the financial system since information is a major factor in financial decision-making.

In effect, the financial system is constituted of different institutions such as commercial banks, stock markets, insurance companies, among others. Furthermore, financial development has several characteristics such as the depth, meaning the size of the financial market, accessibility, efficiency, and stability. In theory, these characteristics should be positively related with the provision of financial services. Several empirical analyses were conducted around the world to study the effect of financial development on economic growth. The results of these studies are mixed and conflicting depending on the financial development indicators used, the sample and period chosen, as well as the econometric model run.

The purpose of this paper is to study the effect of financial development on economic growth in 19 countries in the MENA region over the period between 1980 and 2014, the rest of the paper is divided as follows. Section 2 overviews the macroeconomy in the MENA region. Section 3 examines established growth theories followed by several empirical studies conducted around the world regarding this topic. Section 4 presents the empirical model conducted to study the effect of financial development on economic growth. Section 5 relays the results with a discussion of the analysis. Section 6 summarizes and concludes this paper.

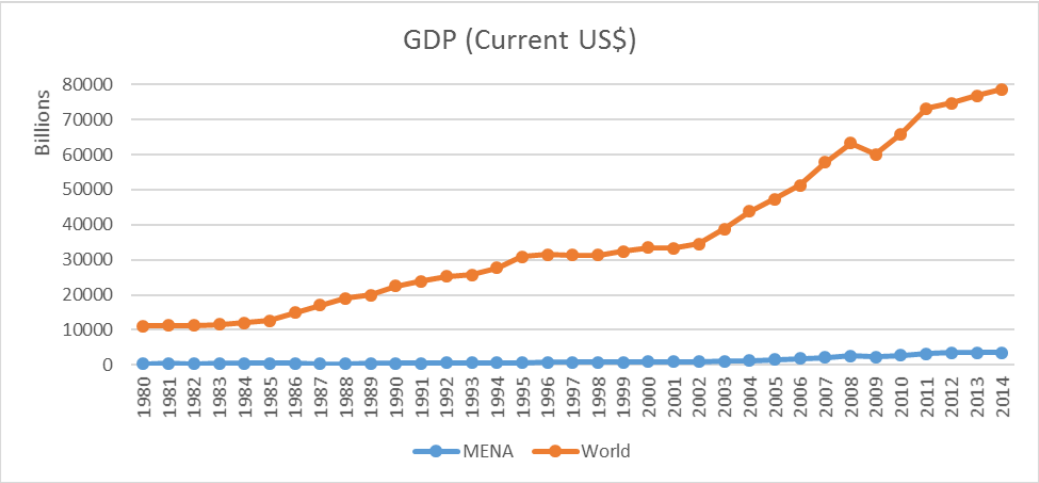
CHAPTER II

MACROECONOMIC OVERVIEW OF THE MENA REGION

The Middle East and North Africa (MENA) region is known for being a region in turmoil. The region witnessed and still witnessing wars, political disorder and economic instability. For instance, currently Syria, Iraq, Libya, and Yemen are in civil war which resulted in a humanitarian catastrophe and infrastructure destruction causing mass displacement of people to neighboring countries fragile or economically strapped such as Lebanon and Jordan (World Bank, 2015). The MENA region is considered a sizable economic entity with reasonable standard of living. Countries in the region vary substantially in resources, economic and geographical size, population, and standards of living (El-Erian, Eken, Fennell, and Chauffour, 1996).

For instance, in 1994, MENA's nominal GDP was equivalent to 2.5% of the world GDP which amounts to 12% of the developing countries GDP (El-Erian, Eken, Fennell, and Chauffour, 1996). In 2014, the nominal GDP of the region accounts for around 4.5% of the world GDP. Saudi Arabia is the largest economy and Jordan and Lebanon are among the smallest economies in the region. Qatar enjoys the highest per capita income in the region along Kuwait and United Arab Emirates (El-Erian, Eken, Fennell, and Chauffour, 1996).

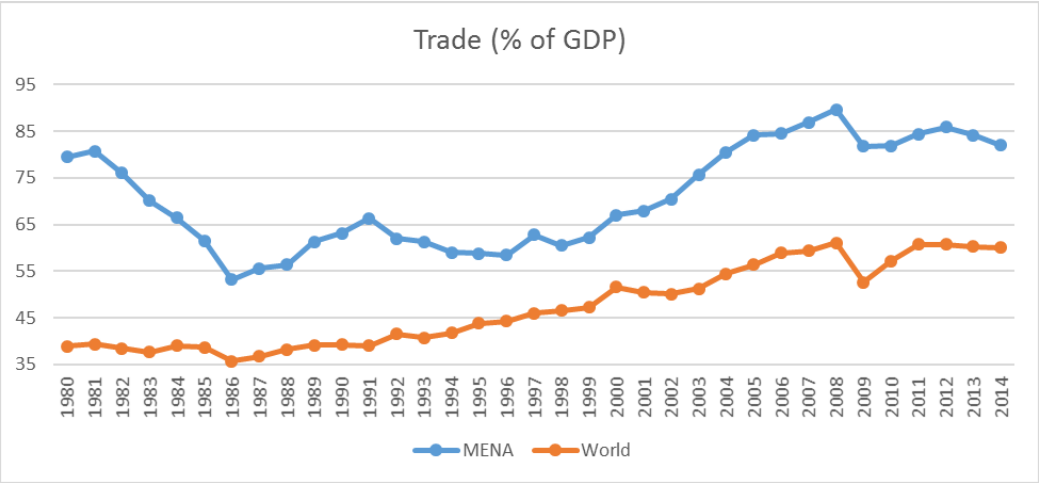
Figure 2.1. GDP (Current US$)



The MENA region enjoys abundant natural resources, with countries having the largest crude oil and natural gas reserves in the world. The region also possesses numerous non-fuel mineral and nonmineral resources such as phosphate, coal, cotton, and coffee among others (El-Erian, Eken, Fennell, and Chauffour, 1996).

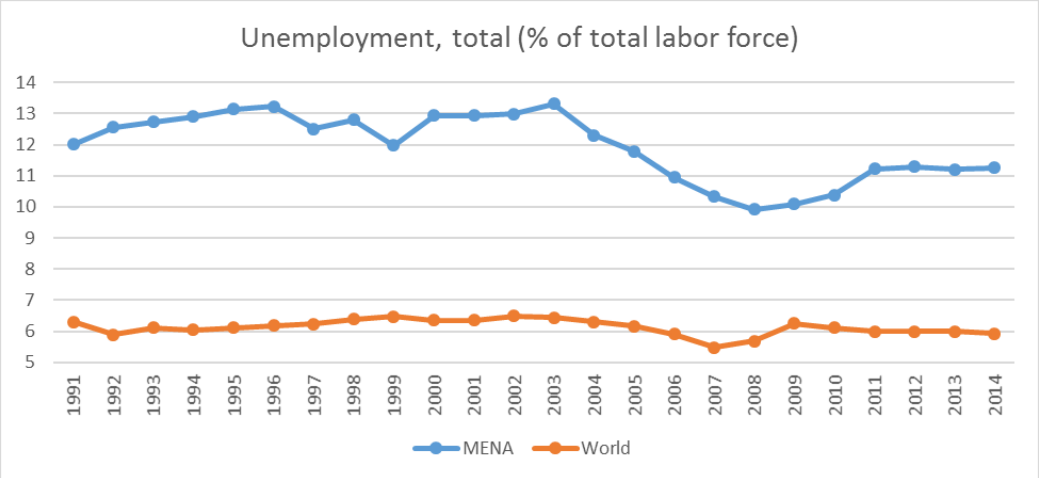
Moreover, the MENA region appears to be very open with a high trade to GDP ratio in comparison with the World. In 1980, this ratio was equal to 79.4% while in 2014, it was equal to 82% indicating a rise in trade even though a major decrease occurred in 1986, the MENA region recovered from this shock. Between 1989 and 1994, Oil and oil-related products accounted for around three quarters of the region's exports (Erian, Eken, Fennell, and Chauffour, 1996).

Figure 2.2. Trade (% of GDP)



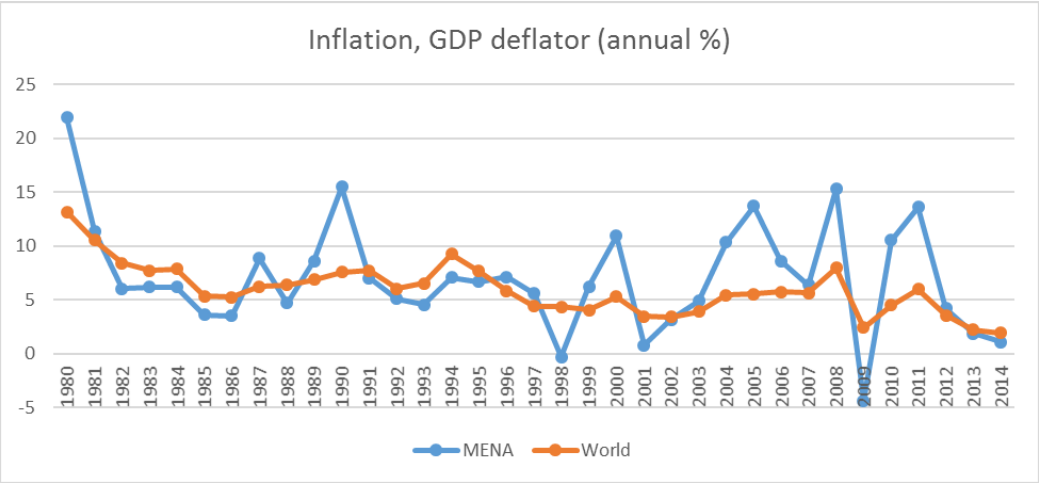
On the other hand, unemployment rate in the MENA region is very high compared with the World rate starting at 12% in 1991, the double of the World rate, and decreasing to 11% in 2014. The lowest unemployment rate was in 2008 and equal to 9.9% while the highest rate was in 2013 and equal to 13.3%.

Figure 2.3. Unemployment in the MENA region



Inflation in the MENA region is very fluctuating. However, it seems that the fluctuation is consistent with the World's inflation rate. Inflation decreased immensely since 1980, starting with 21.9% to reach 1.11% in 2014.

Figure 2.4. Inflation in the MENA region



Based on Table 1 below, financial development in the MENA region varies by country. In general, the financial sector developed largely since 1980 in the region. It is worth noting that the table below include financial development indicators representing the size of the sector. Lebanon had the highest liquid liabilities in the region with a ratio of 252.7% in 2014, greater than the double of the second highest ratio held by Jordan, while Malta had the highest private credit by deposit money banks ratio of 103.86% and Iraq the lowest with a ratio of 6.8%. The highest ratio of deposit money bank assets to deposit money bank assets to central bank assets went to Qatar in 2014. These large differences between the highest and lowest financial development ratios in the region points to the diversity of the region in its economic structure, institutions, and politics. Additionally, the MENA region is a region with countries inhabiting major conflicts in the world and countries having the highest per capita income in the world, these factors might affect neighboring countries and the whole region, their consequences might also explain the large differences between the countries.

Table 2.1. Financial development indicators in the MENA region

	Liquid liabilities to GDP (%)				Deposit money bank assets to deposit money bank assets and central bank assets (%)				Private credit by deposit money banks to GDP (%)			
	1980	**1990**	**2000**	**2014**	**1980**	**1990**	**2000**	**2014**	**1980**	**1990**	**2000**	**2014**
Algeria	54.02	57.69	34.97	65.88	81.79	75.19	89.27	99.9	45.13	51.18	5.01	17.16
Bahrain	42.53	58.13	60.45	74.39			99.01		34.38	28.05	39.42	65.1
Djibouti		71.92	57.48	80.75			91.55	93.48		46.17	32.34	29.77
Egypt, Arab Rep.	58.38	75.78	72.85	72.02	48.74	52.96	74.44	73.76	15.88	23.23	49.56	24.87
Iran, Islamic Rep.	60.01	56.45	36.39		69.76	41.36	68.1		29.09	21.45	21.42	48.34
Iraq				34.89				92.94				6.8
Jordan	74.15	122.14	107.58	121.5	85.67	72.94	87.73	95.19	42.23	59.54	69.98	69.21
Kuwait	33.19		67.88	70.68			99.75		30.58		44	65.08
Lebanon	181.03	159.34	180.75	252.7	89.87	82.77	96.28	84.37	104.27	61.49	83.09	96.11
Libya					50.48	42.65	43.26					
Malta	122.26	135.4	147.42		99.93	98.02	99.65	96.56	25.84	70.82	101.81	103.9
Morocco	38.5	49.23	68.26	108.9	64.63	69.07	91.65	99.31	14.04	15.61	46.47	67.11
Oman	13.95	24.9		39.9	99.96	97.32	99.84	99.43	12.35	19.47		43.99
Qatar				62.73			99.95	99.99				41.5
Saudi Arabia	13.1	41.99	43.51	58.56					5.84	17.09	23.59	42.16
Syrian Arab Republic	41.04	52.18	56.82		50.19	45.31	54.18		5.37	7.16	8.33	
Tunisia	42.13	49.5	56.02	67.67	96.78	99.11	99.17	98.85	34.21	53.48	54.53	70.78
United Arab Emirates	19.01	49.05	45.72	74.9	94.51	99.66		95.95	21.12	37.63	44.38	62.06
West Bank and Gaza			68.62	65.93			98.73	99.86			21.01	30.03
Yemen, Rep.		44.31	24.05			12.47	56.27			4.91	3.93	

The stock market in the MENA region is generally considered weak with the GCC market capitalization relatively low in comparison with the other countries in the MENA region which can be the consequence of the 1991 Gulf War and to the illiquidity and closeness of these markets (Neaime, 2015). On the other hand, Egypt, Morocco, and Turkey hold record market capitalization growth due to the privatization plans introduced and to the strategies enhancing the efficiency, depth, and liquidity of the stock markets (Neaime, 2015).

The above features characterize the MENA region as an interesting region to study whereby although the countries are all located in the same region, differences in economic growth, income, standard of living, financial development, and openness are large.

CHAPTER III

LITERATURE REVIEW

Several economic growth models and theories have been discovered over the years. This section discusses neoclassical exogenous economic growth theory, the convergence theory, location growth theory and the endogenous theory followed with an overview of the literature focusing on empirical studies assessing the relationship between financial development and economic growth around the world.

A. Exogenous Growth Theory

Harrod Domar economic growth model, an exogenous growth theory, states that economic growth depends on the savings rate, the capital productivity and incremental capital-output ratio, and the population growth. A critical assumption of Harrod Domar model is the fixed proportions of the production implying that labor and capital are substitute in production. This assumption is later dropped by Robert M. Solow when he develops an extension of this neoclassical economic growth theory.

The Solow Growth Model, is one of the basic points of reference to examine the economy long-run growth theory. Based on the neoclassical exogenous theory, and as an extension of the Harrod Domar model of economic growth, the Solow model argues that capital stock and labor force growth, as well as technological advancement affect the output and growth of the economy over time (Solow,1956). An important assumption of this model is that the production function exhibits constant returns to scale and is the base of the supply of goods in the model. In other words, output

depends on the capital stock and the labor force as well as technological improvement. On the other hand, the demand for goods is based on consumption and investment function. In other words, output is divided between consumption and investment. To summarize, the supply of output is a function of the capital stock and the labor force, while the demand side of output is a function of consumption and investment (Solow, 1956; Mankiw). The implications of this model are that capital accumulation and labor growth are based on exogenous factors such as the growth rate of the population, the structure of the labor force, and productivity growth. These factors are believed to explain the steady state level of income per capita. Additionally, the efficiency of labor is another exogenous variable that helps determine the production function. The efficiency of labor reflects the society's knowledge and is positively correlated with the improvement of technology. The findings suggest that to improve income per capita, policies should be based on increasing population growth or the efficiency of the labor force. In other words, capital accumulation, labor force growth, and technological progress are the main forces behind long-run economic growth (Mankiw). A vital question arises in this regard to examine the pace of growth of each country considering the unique characteristics of each. The latter led to the emergence of the convergence hypothesis between rich and poor countries.

B. Convergence

Much research has been conducted to answer the question of convergence between countries. In other words, the question implies to examine if countries that start off poor grow faster than economies that start off rich. The Solow Model predicts the convergence of the countries based on their steady state determined by their saving

rates, population growth rates, and efficiency of labor. For instance, if two countries have the same steady state but start off with different capital stock, then due to the diminishing marginal return to capital, the country with the smaller amount of capital stock will grow faster than the other country leading them to converge and reach the steady state. However, if the countries have different steady states due to differences in their saving rates, population growth rates, and efficiency of labor, then convergence is not expected.

Two types of convergence exist, unconditional convergence states that all countries converge to similar steady state in the long-run which will happen irrespective of the initial state of each economy. Conditional convergence implies that each country converges to its steady state, Mankiw, Romer and Weil (1992) argue that the Solow model predicts a conditional convergence theory whereby each country would reach its respective steady state. This hypothesis implies that different countries can converge to the same steady state if they fulfill the same rate of savings, depreciation, population growth and technology. It is worth noting that the conditional convergence hypothesis has empirical support from literature (Barro, 1991; Mankiw et al., 1992). In view of the latter, several factors determine the steady state of a country reached through economic growth which in theory depends on capital accumulation, labor force growth, and technological progress.

C. Location Growth Theories

The theories discussed above assumes territorial areas to be internally homogenous and uniform. An emerging theory is being established whereby "space" is now diversified allowing "economic activities and production factors, demand and

sectoral structure, to be treated as spatially heterogeneous within a region" (Capello, 2011). The location theory aims at identifying the factors that influence the location of individual activities, the allocation of different portions of territory among different types of production, the dividing of a spatial market among producers, and the functional distribution of activities in space (Capello, 2011). In fact, Gallup, Sachs, and Mellinger (1998) studied the relationship between geography and economic growth. They argue that geography might be directly related to growth and constitute an important factor in economic policy choice. For instance, income levels and income growth are largely affected by location and climate, through their effects on transport costs, disease burdens, and agricultural productivity, among other channels. The scholars note that regions with high population density and rapid population increase are not conducive to modern economic growth, especially for populations located far from the coast and in tropical regions, hence facing large transportation costs for international trade, as well as high disease burden, respectively (Gallup, Sachs, and Mellinger, 1998). These findings suggest that the location of the country is an important determinant of its growth in addition to the traditional components of the growth theories such as capital accumulation, labor force growth, and technological progress.

D. Endogenous Growth Theory

The Solow Model assumes that technological progress is an exogenous factor leading to the growth of the economy. Though, the endogenous growth theory, which emerged in the 1980s (Andersen, 2003), reject this assumption of exogenous technological change (Mankiw). The starting point of the endogenous growth theory is to understand the source of technological improvement. Contrary to the neoclassical

theory, technological progress is believed to be an endogenous outcome. Romer (1986) argues that accumulation of knowledge leads to long run economic growth. This new path is not based on decreasing return to scale assumption, but instead on constant or increasing return to scale which implies that this theory does not emphasis the concept of convergence. Romer (1986) and Lucas (1988) are the pioneer of this theory.

Endogenous growth theories rely on an output function dependent on factors that affect technology along human and physical capital (Pack, 1994). The theory implies that financial development indicators could be used as endogenous variables leading to technological innovation which can affect economic growth.

E. Empirical Literature

Several scholars examined this implication empirically, investigating the relationship and causality direction between financial development and economic growth in the world. The results of these studies are dependent on the indicators representing financial development, the countries and years included in the studied sample, as well as the econometric model run. The mixed and conflicting results of the empirical literature are presented below.

Evidence of positive relationship between financial development and economic growth is provided by Goldsmith (1969), McKinnon (1973), and Shaw (1973) who studied the relationship liaising economic growth with the financial structure of a country. Their findings culminated in proving that the financial superstructure of an economy does in fact improve its growth arguing strongly in favor of the financial system liberalization. This is indeed possible by allocating funds to their best users and thus producing the highest social return. On his own, Goldsmith, a pioneer in the

economic growth analysis studied the relation between financial institutions assets and the GDP in 35 developed and less developed countries between 1860 and 1963. His findings demonstrated that there is a positive correlation between financial development and economic growth. He concluded by saying that financial structure in the economy "accelerates economic growth and improve economic performance to the extent that it facilitates the migration of funds to the best user, that is, to the place in the economic system where the funds will yield the highest social return" (Goldsmith, 1969).

In another study offering evidence for a positive relationship, Thorsten Beck, Ross Levine, and Norman Loayza (1999) study the relationship between financial intermediary development and the sources of growth. They empirically examine the impact of financial intermediaries on private savings rates, capital accumulation, productivity growth, and overall economic growth. The authors use two econometric procedures, a pure cross-sectional instrumental variable estimator to exploit the long-run impact and a dynamic Generalized-Method-of-Moments (GMM) panel estimator to evaluate the time series nature of the data. For the cross-sectional instrumental variable estimator, they use data for 63 countries over the period between 1960 and 1995. The instrumental variable for financial intermediary development used to address simultaneity bias is the legal origin of each country. The authors use this specific instrumental variable as exogenous because a considerable body of research suggests that legal origin substantively accounts for cross-country differences in features of the contracting environment such as creditor rights, systems for enforcing debt contracts, and standards for corporate information disclosure (La Porta et al., 1997). The dependent variable is, in turn, real per capita GDP growth, real per capita capital stock growth, productivity growth, or private savings rates. The scholars conduct the second

econometric procedure using the GMM panel estimator to exploit the time-series dimension of the data, account for the omission of country-specific effects bias, and control for the endogeneity of all the regressors. The panel dataset range over the period of 1960-1995 and includes data averaged over each of the seven five year periods. The authors use private credit as a financial development indicator, as well as liquid liabilities, and the ratio of deposit money bank assets to deposit money bank assets and central bank assets. The results suggest that financial intermediary development has a positive and significant effect on real per capita GDP growth and Total Factor Productivity growth. However, the effect on private savings is ambiguous with different results when comparing the two econometric procedures. For instance, private credit is significantly positive in the first method and insignificant in the second. This paper's results support the view that better functioning financial intermediaries improve resource allocation and accelerate total factor productivity growth with positive repercussions for long-run economic growth.

Similarly, Allen and Ndikumana (2000) examine the effect of financial development on economic growth in the Southern African region. Their sample includes eight countries from the Southern Africa Development Community (SADC) with data for the period 1972-1996. They conduct three different analysis procedures to compare their results: the simple ordinary least square (OLS) regression, country specific fixed effect regression, and regressions including a high-income dummy. Allen and Ndikumana use credit to the private sector, the volume of credit provided by banks and liquid liabilities of the financial system, and an index of financial development combining these three indicators as indicators of financial development to study the effect of financial development on economic growth measured by real per capita GDP.

The scholars also control for other factors of economic growth such as openness, debt service, inflation, and government consumption. The results suggest that financial development has a positive and significant effect on economic growth when using liquid liabilities (as a percentage of GDP) as an indicator of the size of the financial sector. However, when credit to private sector and the index are used as indicators, the effect is positive but not statistically significant, while credit provided by banks has a negative but insignificant effect on economic growth. The authors mixed results can be due to the short sample size.

Furthermore, King and Levine (1993) studied the relationship between financial development and economic growth by presenting evidence using data from 80 countries over the period 1960-1989 running a cross-country regression. The analysis expands on Goldsmith's analysis. The authors use the ratio of liquid liabilities to GDP as a measurement of financial depth, the ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets as a measurement of the relative importance of specific financial institutions, the ratio of claims on the nonfinancial private sector to total domestic credit (excluding credit to money banks) and the ratio of claims on the nonfinancial private sector to GDP as measurements of domestic asset distribution. To study the effect of these financial indicators on growth, they use the per capita GDP growth, the rate of physical capital accumulation, the ratio of domestic investment to GDP, and a residual measure of improvements in the efficiency of physical capital allocation as growth indicators. King and Levine (1993) found that the level of financial development is positively correlated with current and future rates of economic growth, physical capital accumulation, and economic efficiency improvements.

Moreover, Arestis and Demetriades (1997) examine the impact of financial development on economic growth employing a time-series approach using quarterly data for Germany and United States over the period 1979-1991. They include the real GDP per capita, the stock market capitalization ratio, an index for stock market volatility, and another indicator of the development of the banking system. The results suggest that in Germany a uni-directional causality relationship exists from financial development to real GDP and that GDP per capita is positively related to the banking system development and negatively related to the stock market volatility. In the United states, the results suggest that real GDP causes banking system and capital market development. However, the evidence is insufficient to conclude that financial development leads to real GDP growth.

In the same vein, Choe and Moosa (1999) investigate financial development effect on economic growth in South Korea over the period 1970-1992. The authors use indicators to measure the access of the household and business sectors to capital markets and financial intermediaries. They examine the effect of these indicators on economic growth measured with real GDP growth and the gross rate of gross fixed capital formation. The results suggest that financial development causes real growth and that financial intermediaries are more important in this causal relationship than the capital markets.

In another experiment, Jung (1986) studies the causality relationship between financial development and economic growth. The author investigates this causality problem in 56 countries using Granger causality method as an empirical analysis over the period 1951-1980. Jung examine the effect of two proxies of the financial development on the real per capita GNP in 1975 prices. The two proxies are the sum of

currency and demand deposit (M1) as a measurement of the complexity of the financial structure and the monetization variable as a measurement of the real size of the financial sector. The results suggest that financial development Granger causes economic growth more frequently than the reverse. Additionally, in the Less Developed Countries, the causal direction runs from financial development to economic growth while in developed countries the reverse holds more often.

Similarly, Demetriades and Hussein (1996) examine the causality relationship between financial development and economic growth in 16 developing countries over the period 1960-1990. They conduct cointegration tests followed with causality tests for each country. The authors employ the ratio of bank deposit liabilities to nominal GDP and the ratio of bank claims on the private sector to nominal GDP as financial development indicators, and the real GDP per capita as the economic development indicator. The results suggest a bi-directional relationship between financial development and economic growth. However, they find little evidence to support the view that financial development causes economic growth.

Additionally, many authors studied the relationship between financial development, economic growth, and poverty. For instance, Pradhan (2011) studied the causal relationship between financial development, economic growth and poverty reduction. The author use time series data for India over the period of 1951-2008 to run cointegration and causality tests. The Granger causality results suggest that poverty reduction leads to economic growth, economic growth Granger causes financial development, financial developments leads to poverty reduction and economic growth Granger causes poverty reduction.

Likewise, Kar et al. (2011) investigate the causal relationship between financial development, economic growth, and poverty reduction through a time series VECM Granger causality econometric model using data for Turkey over the period 1970-2007. Three proxies are used for the financial development measurements, the ratio of broad money (M2) to GDP, the ratio of domestic credit to GDP, and the ratio of private sector credits to GDP, while economic growth is measured by GDP per capita, and poverty by per capita final consumption expenditure and per capita households' final expenditure. The results suggest that financial development leads to economic growth and economic growth granger causes poverty reduction. However, the causality relationship between financial development and poverty reduction is weak in the short-run.

Also, Odhiambo (2009) examined the causal relationship between financial development, economic growth, and poverty reduction in South Africa over the period of 1960-2006. The author conducts a trivariate Granger causality test and uses the cointegration-based error-correction mechanism. Odhiambo uses the ratio of broad money stock (M2) to nominal GDP as a proxy to financial depth, real GDP per capita as an indicator of economic growth, and per capita consumption as a proxy of poverty. According to the results, financial development and economic growth Granger cause poverty reduction and that economic growth Granger causes financial development which leads to poverty reduction in both the short-run and long-run.

Conflicting results arise from examining financial development effect on economic growth in the literature. For instance, contrary to the hypothesis and empirical studies presented above, several researchers found that financial development negatively affects economic growth.

In fact, Ram (1999) investigate the relationship between financial development and economic growth in 95 countries over the period of 1960-1989. The results indicate that 56 countries out of the 95 outline a negative relationship with 16 among them at a 5% significance level, while 9 countries out of the 95 reveal a positive and significant relationship between financial development and economic growth. The author highlights that the positive effect of the financial development on growth is not sufficiently sustained by the empirical works (Ram, 1999). Andersen and Trap (2003) confirm Ram's (1999) conclusion through re-estimating Levine et al. (1999) study mentioned above, employing the legal origin as an instrument for financial development. The results from the GMM estimator suggest that while the full sample indicate a positive and significant relationship, estimations performed on the sample consisting of sub-Saharan African and Latin American countries indicates that financial development effect on growth was at best insignificantly over the period 1960–1995, and at worst, it had a negative influence (Andersen and Traps, 2003).

Similarly, Favara (2003) reexamines Levine, Loayza and Beck (2001) study using a panel of 85 countries with observations spanning over the period 1960-1998. The author uses liquid liabilities and credits to private sector as financial development indicators. Favara's (2003) results demonstrate that the relationship between financial development and economic growth is ambiguous and differs according to the econometric model estimated. In fact, the OLS results suggest a positive relationship while the GMM dynamic panel data estimation including the legal origin as instrument to treat for the endogeneity of financial development, find no evidence on the impact of financial development on growth pattern.

Additionally, De Gregorio and Guidotti (1995) reach similar conclusion by exploring this relationship in 12 Latin American countries over the period 1950-1985 and using the ratio of bank credit to the private sector to GDP as the financial development indicator and GDP per capita as the economic growth indicator. The scholars find a negative and significant correlation between financial improvement and economic growth. They interpret this effect as the result of the collapse of financial liberalization experiments conducted in Latin America in the 1970s and 1980s. De Gregorio and Guidotti (1995) conclude that in the absence of proper regulations, development of financial intermediation can be associated with lower efficiency in investment and thus lower economic growth.

Similarly, Bolbol et al. (2005) investigate the relationship between financial structure and total factor productivity (TFP) in Egypt over the period of 1974-2002. The authors include bank and stock market development indicators in their empirical analysis. The results show that bank development has a negative effect on TFP while stock market development has a positive effect on productivity.

In the same vein, Ben Naceur & Ghazouani (2003) examine the effect of bank and stock market development on economic growth in 10 countries in the MENA region using GMM estimation method for panel data observations over a period covering mainly the 1980s and 1990s based on the availability of data. Economic growth is represented by real per capita GDP growth, while bank development is denoted by bank credit to private sector and stock market development is characterized by several measures, such as market capitalization over GDP, market turnover over GDP and value traded over GDP. The results suggest that the relationship between bank development and growth is negative and significant when controlling for stock market development

by using stock market capitalization over GDP as a measure of equity market development (Ben Naceur & Ghazouani, 2003).

Moreover, Saci, Giorgioni, and Holden (2009) investigate the relationship between financial development and economic growth for 30 developing countries with panel annual data over the period of 1988-2001, using methods-of-moments (GMM) one step estimation technique. The financial development indicators chosen capture banking sector and stock market effects on GDP per capita, the proxy of economic growth. The ratio of commercial bank assets over commercial and central bank assets, domestic credit to the private sector, liquid liabilities, the ratio of total value of shares traded over average market capitalization, and the value of shares traded are the financial development indicators. The results suggest that the stock market development variables are positively and significantly linked to economic growth while the standard banking sector variables, credit to the private sector and liquid liabilities, have negative effects on growth.

The above literature review constitutes evidence on mixed results regarding the financial development effect on economic growth. This paper aims at investigating this relationship using three financial development indicators.

CHAPTER IV

EMPIRICAL METHOD

A. Data Description

This chapter presents the data used, specifically the financial development indicators and economic growth indicator, as well as the rationale of the selection of these variables.

This paper is based on a panel data analysis for the Middle East and North Africa (MENA) region including only 19 countries due to the unavailability of data for the remaining countries in the region. The time span in the panel covers all the years from 1980 to 2014 for the following countries Algeria, Bahrain, Djibouti, Egypt, Arab Rep., Iran, Islamic Rep., Iraq, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Syrian Arab Republic, Tunisia, United Arab Emirates, West Bank and Gaza, and Yemen, Rep.

1. Measures of Economic Growth and Financial Development

The set of indicators of economic growth and financial development chosen are based on previous empirical studies mentioned in chapter 2 of this paper and on the availability of data in the targeted region. A multicollinearity test was conducted with the three financial development indicators to confirm the validity of their use together in one equation.

The economic growth indicator is the GDP per capita variable which represents the gross domestic product divided by midyear population (Andersen, 2003). According

to previous empirical studies, GDP per capita measure is a valid indicator of economic growth (Levine, 1997). Most of the empirical studies conducted regarding financial development effect on economic growth used the GDP per capita as an indicator of economic growth and standard of living (Beck, Levine, and Loayza, 1999; Allen and Ndikumana, 2000; King and Levine, 1993; Arestis and Demetriades, 1997; Andersen, 2003). The data are extracted from the World Development Indicators (WDI) database of the World Bank.

The first financial indicator used is *the ratio of liquid liabilities to GDP*. This variable was extracted from the World Development Indicators (WDI) database of the World Bank which indicates its source as the International Financial Statistics (IFS) published by the International Monetary Fund (IMF). According to the World Bank, liquid liabilities are a measure of "financial depth" and are also known as broad money, or M3. They are the sum of currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travelers checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents. In other words, liquid liabilities are an indicator of the size of the financial sector (Levine, 1997) which in theory, should be positively related to the provision of financial services. Many empirical studies mentioned in Chapter 2 used this indicator of financial development to examine its effect on economic growth (Levine, Loayza, and Beck, 2000; Allen and Ndikumana, 2000; King and Levine, 1993; Andersen, 2003). However, King and Levine (1993) stress on the fact that the size of the financial system might not be

"closely related to financial services such as risk management and information processing".

The second financial development indicator is the ratio of *deposit money bank assets to deposit money bank assets and central bank assets (%)* which measures the relative importance of specific financial institutions (King and Levine, 1993), in this case, the central banks and deposit money banks. This variable was extracted from the World Development Indicators (WDI) database of the World Bank which indicates its source as the International Financial Statistics (IFS) published by the International Monetary Fund (IMF). According to the World Bank, the ratio of deposit money bank assets to deposit money bank assets and central bank assets (%) is the total assets held by deposit money banks as a share of sum of deposit money bank and Central Bank claims on domestic nonfinancial real sector. Assets include claims on domestic real nonfinancial sector which includes central, state and local governments, nonfinancial public enterprises and private sector. Deposit money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits. Although, this variable does not measure directly the quantity and quality of financial services provided (Levine, Loayza, and Beck, 2000), the hypothesis is that banks provide better risk management, information acquisition, and monitoring services than central banks (King and Levine, 1993). Therefore, including this variable is indicative of financial intermediary development.

The third financial development indicator is the ratio of *private credit by deposit money banks to GDP (%)*. This variable was extracted from the World Development Indicators (WDI) database of the World Bank which indicates its source as the International Financial Statistics (IFS) published by the International Monetary Fund

(IMF). According to the World Bank, the ratio of private credit by deposit money banks to GDP (%) is the financial resources provided to the private sector by domestic money banks as a share of GDP. Domestic money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits. This variable is a measure of the financial sector size (Levine, Loayza, Beck, 2000) and add to the other indicators in explaining the effect of financial development on economic growth.

Other financial development indicators are employed in the literature, such as the ratio of bank claims on private sector to GDP (Demetriades and Hussein, 1996), indicators to measure the access of the household and business sectors to capital markets and financial intermediaries (Choe and Moosa, 1999), and the ratio of broad money stock (M2) to nominal GDP (Odhiambo, 2009), among other indicators. However, based on data availability for the region and on multicollinearity tests of several sets of financial development indicators, the above three indicators were chosen to represent the effect of financial development on economic growth.

2. Multicollinearity Test

To test the effect of financial development on economic growth, a set of three financial development indicators were chosen to be able to calculate unique estimates of each variable effect on GDP per capita. Multicollinearity test was conducted to ensure the use of this set of financial proxies together in a regression will lead to accurate effect estimates.

Table 4.1. Multicollinearity Test

Collinearity Diagnostics

Variable	VIF	SQRT VIF	Tolerance	R-squared
LL	2.3100	1.5200	0.4324	0.5676
DM	1.4000	1.1800	0.7123	0.2877
PC	2.9000	1.7000	0.3452	0.6548
Mean VIF	2.2000			

	Eigenval	Cond Index
1	3.6607	1.0000
2	0.2357	3.9408
3	0.0843	6.5907
4	0.0193	13.7735
Condition Number		13.7735

Eigenvalues & Cond Index computed from scaled raw sscp (w/ intercept)
Det(correlation matrix) 0.3342

The variance inflation factor (VIF) assesses the severity of multicollinearity in the dataset, when its value exceeds 10, evidence of the existence of problematic multicollinearity is found (Asteriou and Hall). In the case of our three financial indicators, the multicollinearity Table 2 presented above highlights the highest VIF equal to 2.9 for the *private credit by deposit money banks to GDP (%)* (PC) variable with all the other VIF values below 10. These observations indicate that the three financial development indicators can be used in a regression together.

B. The Econometric Model

A common model choice for macroeconomists is the fixed effects (Judson and Owen, 1996). In macroeconomic datasets, this model is usually more appropriate than a random effects model. This is because the sample of countries targeted is not random

and if the individual effect represents omitted variables, it is highly likely that these country-specific characteristics are correlated with the other regressors. The Anderson and Hsiao estimator can also be considered as a fully restricted GMM two-step estimator (Judson and Owen, 1996).

The GMM techniques control for unobserved country specific effects, first difference unit root variables, and account for the endogeneity of the explanatory variable through adding instruments to the regression (Saci, Giorgioni, and Holden, 2009).

A dynamic fixed effect model is of the following form

$$y_{i,t} = \gamma y_{i,t-1} + x'_{i,t}\beta + \eta_i + \varepsilon_{i,t}$$

η_i is a fixed effect

$x_{i,t}$ is a $(\mathrm{K}-1)$x1 vector of exogenous regressors

$\varepsilon_{i,t} \sim \mathrm{N}(0, \sigma_\varepsilon^2)$ is a random disturbance

The assumptions are as follow

$$\sigma_\varepsilon^2 \geq 0,$$

$$E(\varepsilon_{i,t}, \varepsilon_{j,s}) = 0 \; i \neq j \; or \; t \neq s$$

$$E(\eta_i, \varepsilon_{j,t}) = 0 \; \forall \; i, j, t$$

$$E(x_{i,t}, \varepsilon_{j,s}) = 0 \; \forall \; i, j, t, s$$

This model includes a lagged dependent variable as a regressor. The least squares dummy variable estimator (LSDV) is the usual approach to estimating a fixed-

effects model. However, it will generate a biased estimate of the coefficients if the time dimension is small (Judson and Owen, 1996). When there are no exogenous regressors and T is very large, this bias approaches zero (Nickell, 1981).

In the case of a panel data when T is not very large, Anderson and Hsiao (1981) propose an instrumental variable procedure.

As a first step, to remove the fixed effect, the initial equation is differenced

$$(y_{i,t} - y_{i,t-1}) = \gamma(y_{i,t-1} - y_{i,t-2}) + (x_{i,t} - x_{i,t-1})'\beta + (\varepsilon_{i,t} - \varepsilon_{i,t-1})$$

The errors $(\varepsilon_{i,t} - \varepsilon_{i,t-1})$ are now correlated with the one of the independent variables $(y_{i,t-1} - y_{i,t-2})$. Anderson and Hsiao (1981) recommended instrument is for $(y_{i,t-1} - y_{i,t-2})$ with $y_{i,t-2}$. The second lagged value of the independent is not correlated with the new disturbance in the differenced equation.

The Anderson and Hsiao estimator employed is then

$$\hat{\delta}_{AH} = (Z'X)^{-1}Z'Y$$

Z is a K x N(T-2) matrix of instruments

X is a K x N(T-2) matrix of regressors

Y is an N(T-2) x 1 vector of dependent variables

$$Z_i = \begin{bmatrix} y_{i,t} & \Delta x_{i,3} \\ \vdots & \vdots \\ y_{i,T-2} & \Delta x_{i,T} \end{bmatrix} = \begin{bmatrix} Z_1 \\ \vdots \\ Z_N \end{bmatrix}$$

$$X_i = \begin{bmatrix} \Delta y_{i,2} & \Delta x_{i,3} \\ \vdots & \vdots \\ \Delta y_{i,T-1} & \Delta x_{i,T} \end{bmatrix} = \begin{bmatrix} X_1 \\ \vdots \\ X_N \end{bmatrix}$$

$$Y_i = \begin{bmatrix} \Delta y_{i,3} \\ \vdots \\ \Delta y_{i,T} \end{bmatrix} = \begin{bmatrix} Y_1 \\ \vdots \\ Y_N \end{bmatrix}$$

Where $\Delta y_{i,t} = y_{i,t} - y_{i,t-1}$

Judson and Owen (1996) compare several econometric methods for estimating dynamic models with macroeconomic panel characteristics such as OLS, LSDV, AH, GMM, and others. They use a panel of countries to study the relationship between savings and growth and find that for a sufficiently large N and T, the corrected LSDV and the AH estimator consistently outperform the others with the AH estimator producing the lowest average bias. Therefore, they conclude by recommending the Anderson-Hsiao estimator when the panel's time dimension is large.

Based on the above analysis and the characteristics of the panel dataset of this paper, we will proceed with the use of the Anderson-Hsiao estimator as our econometric method.

CHAPTER V

RESULTS AND DISCUSSION

The results of the empirical analysis conducted based on the Anderson-Hsiao estimator are presented below. The findings are grouped and presented in four groups as follows. Part 1 presents the results of the regression run on the 19 MENA countries. Part 2 examines the effect of financial development on the studied 19 countries divided between oil producing countries compared with non-oil countries. Part 3 investigates the relationship in the 19 targeted MENA countries divided based on their income level. Finally, Part 4 discusses the results when the yearly observations are divided based on the regime of the 19 countries over the period of 1980-2014.

A. MENA Results

Table 3 tabulates the regression results including 19 countries of the MENA region listed above over the period of 1980-2014, with the GDP per capita as the dependent variable and the three financial development indicators as the independent variables.

Table 5.1. MENA results

Instrumental variables (2SLS) regression

Source	SS	df	MS
Model	-164356394	4	-41089098.6
Residual	676667759	411	1646393.57
Total	512311364	415	1234485.22

Number of obs	416
F(4,416)	16.55
Prob>F	0.0000
R-squared	
Adj R-squared	
Root MSE	1283.1

D.GDP per Cap	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
GDP per Cap LD.	1.02911	0.19169	5.37000	0.00000	0.65229	1.40592
LL D1.	-56.20222	10.24069	-5.49000	0.00000	-76.33288	-36.07157
DM D1.	-15.39245	17.32592	-0.89000	0.37500	-49.45093	18.66604
PC D1.	-4.04842	18.13981	-0.22000	0.82400	-39.70680	31.60996
C	60.75293	64.75018	0.94000	0.34900	-66.52992	188.03580

The results presented in Table 3 suggest that increasing liquid liabilities will lead to a decrease in GDP per capita. The coefficients of liquid liabilities, deposit money bank assets to deposit money bank assets and central bank assets (%), and private credit by deposit money banks to GDP (%) are all negative. However, only liquid liabilities coefficient is significant at the 1% level, indicating that improving the size of the financial sector with a special focus on liquid liabilities will not lead to economic growth, but will decrease GDP per capita. In other words, increasing financial services can worsen the economic growth in the MENA region. These findings could be the results of financial instability and financial repression in the region, as well as the continuous presence of conflict. The latter can be associated with the location growth theory whereby population displacement occurs in period of wars leading to an increase in population density which can increase the size of the financial sector worsening economic growth.

Previous empirical studies suggest similar results (De Gregorio and Guidotti, 1992; Ram, 1999; Ben Naceur and Ghazouani, 2003; Andersen and Tarp, 2003; Favara,

2003) leading to believe that contrary to the theory, financial development is not always positively correlated with economic growth. The relationship between financial depth and economic growth varies with the sample and period studied.

The regression was first ran with only the dependent variable, GDP per capita, and the three independent variables. Furthermore, to test for the efficiency of the AH estimator, we included more variables in the instrument matrix, and then in the independent variables matrix. These additional variables are *Trade (% of GDP)*[1] representing the sum of exports and imports of goods and services measured as a share of gross domestic product, *Inflation, consumer prices (annual %)*[2], and *Population*[3]. The tables of the two additional regressions are presented in the Appendix. Including these variables did not change the results and significance reported in the first regression. In fact, in the two additional regressions, only Liquid Liabilities has a significant negative effect and the other two financial indicators have negative insignificant effect on GDP per capita. Moreover, when including the additional variables in the independent variables matrix, the results indicate that their effect is insignificant on economic growth. These presented observations emphasize the efficiency of the AH estimator.

To further understand the effect of financial development on economic growth in the MENA region, additional analysis is conducted. First, we compare the effect of the three indicators on GDP per capita in the Oil producing countries to the Non-Oil countries of the MENA region. Then, the MENA region countries are divided in three

[1] World Bank national accounts data, and OECD National Accounts data files
[2] International Monetary Fund, International Financial Statistics and data files, World Bank
[3] World Development Indicator, World Bank

groups based on their income level. Last, the division is based on the polity index of each country in each year indicating the nature of the regime.

B. Oil vs. Non-Oil Countries

Table 4 and Table 5 below present the results of the regressions including only the dependent and independent variables for the Oil producing countries and Non-Oil countries, respectively.

Table 5.2. Oil countries results

Oil Group
Instrumental variables (2SLS) regression

Number of obs	174
Wald chi2(4)	41.83
Prob>chi2	0.0000
R-squared	
Root MSE	1792.6

D.GDP per Cap	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
GDP per Cap LD.	0.95017	0.26260	3.62000	0.00000	0.43547	1.46486
LL D1.	-87.77091	20.04218	-4.38000	0.00000	-127.05290	-48.48896
DM D1.	-6.24225	27.38089	-0.23000	0.82000	-59.90781	47.42332
PC D1.	-9.33086	36.73234	-0.25000	0.79900	-81.32492	62.66319
C	23.63623	144.17660	0.16000	0.87000	-258.94480	306.21730

The Oil countries include Algeria, Bahrain, Iran, Iraq, Kuwait, Libya, Oman, Qatar, United Arab Emirates, and Yemen.

Table 5.3. Non-oil countries results

Non-Oil Group
Instrumental variables (2SLS) regression

Number of obs	242
Wald chi2(4)	45.61
Prob>chi2	0.0000
R-squared	
Root MSE	267.53

D.GDP per Cap	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
GDP per Cap LD.	1.03815	0.21320	4.87000	0.00000	0.62029	1.45602
LL D1.	-10.79302	3.20333	-3.37000	0.00100	-17.07142	-4.514616
DM D1.	-29.09106	9.00937	-3.23000	0.00100	-46.74909	-11.43303
PC D1.	-1.32822	5.54892	-0.24000	0.81100	-12.20391	9.54747
C	27.90114	22.20667	1.26000	0.20900	-15.62314	71.42542

Based on the above tables, liquid liabilities have a negative significant effect on GDP per capita in both oil and non-oil countries at the 1% level, while, interestingly, in the non-oil countries, deposit money bank assets to deposit money bank assets and central bank assets (%) negative effect is now significant at the 5% level. These results may suggest that the improvement of financial intermediaries has higher effect on economic growth in the Non-oil countries compared with its effect on Oil producing countries since oil countries' economies growth might not rely on financial development but rather on its oil production. The latter could explain the insignificance of the deposit money bank assets to deposit money bank assets and central bank assets (%) and private credit by deposit money banks to GDP (%) in the Oil producing countries regression.

C. Income Groups

This part of the analysis divide the countries according to their level of income based on the World Bank categorization. The groups are as follows.

Group 1 – High Income: Bahrain, Kuwait, Malta, Oman, Qatar, and United Arab Emirates

Group 2 – Upper Middle Income: Algeria, Iran, Iraq, Jordan, Lebanon, Libya, Tunisia

Group 3 – Lower Middle Income: Djibouti, Egypt, Morocco, Syrian Arab Republic, West Bank and Gaza, Yemen

Table 5.4. High income group results

High Income Group
Instrumental variables (2SLS) regression

Number of obs	107
Wald chi2(4)	22.77
Prob>chi2	0.0001
R-squared	
Root MSE	2333

D.GDP per Cap	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
GDP per Cap LD.	1.04296	0.32577	3.20000	0.00100	0.40446	1.68146
LL D1.	-35.92882	69.24610	-0.52000	0.60400	-171.64870	99.79104
DM D1.	6.15763	157.16520	0.04000	0.96900	-301.88060	314.1959
PC D1.	-61.31442	69.10151	-0.89000	0.37500	-196.75090	74.12206
C	110.77420	243.37290	0.46000	0.64900	-366.22790	587.77620

The results indicate than the three financial development indicators do not have any significant effect on economic growth in the countries with the high-income level in the MENA region. The countries included in this group are mostly oil producing countries (5 out of the 6 countries in the group) which might infer that high-income countries with oil resources do not need financial development to grow.

Table 5.5. Upper middle income group results

Upper Middle Income Group
Instrumental variables (2SLS) regression

Number of obs	163
Wald chi2(4)	197.61
Prob>chi2	0.0000
R-squared	0.502
Root MSE	397.87

D.GDP per Cap	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
GDP per Cap LD.	-0.53117	0.31628	-1.68000	0.09300	-1.15107	0.08873
LL D1.	-29.95506	10.87659	-2.75000	0.00600	-51.27279	-8.63734
DM D1.	13.76451	17.62487	0.78000	0.43500	-20.77961	48.30862
PC D1.	18.50710	12.65978	1.46000	0.14400	-6.30561	43.31982
C	103.80660	32.27516	3.22000	0.00100	40.54848	167.06480

Table 5.6. Lower middle income group results

Lower Middle Income Group
Instrumental variables (2SLS) regression

Number of obs	146
Wald chi2(4)	11.34
Prob>chi2	0.0230
R-squared	
Root MSE	107.48

D.GDP per Cap	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
GDP per Cap LD.	1.48267	0.98139	1.51000	0.13100	-0.44082	3.40616
LL D1.	-5.34832	2.13461	-2.51000	0.01200	-9.53209	-1.164561
DM D1.	-1.32159	2.04179	-0.65000	0.51700	-5.32343	2.680257
PC D1.	-4.98464	5.78137	-0.86000	0.38900	-16.31592	6.34664
C	-2.73085	18.73568	-0.15000	0.88400	-39.45211	33.99042

The results of the other two income groups of lower and upper middle income indicate that only liquid liabilities have significant negative effect on GDP per capita at the 5% and 1% level, respectively. This might signify that the size of the financial market is more significant in upper middle income countries compared with lower middle income countries where financial services might not be fully developed yet.

D. Polity Groups

This part of the analysis divided the observations of the 19 countries of the MENA region over the period 1980-2014 in four groups based on their Polity IV index. This index captures the regime authority spectrum on a 21-point scale ranging from -10 to +10, examining qualities and characteristics of democratic and autocratic regimes. Countries with a polity index above 5 are considered as democracies, below 5 as autocracies, and in between as anocracies, meaning mixed and incoherent regimes. Three additional special values of -66, -77, -88 represents periods of interruption, interregnum, and transition, respectively.

However, it is worth noting that due to the unavailability of data and the small sample size in each group, certain groups covered a small number of observations which inspired the inclusion of additional variables in the regression based on each group unique characteristics. Although the number of observations is low in each group and the results cannot be validated or generalized, this part of the analysis encompasses some interesting results.

Group 1: Democracies

Group 2: Autocracies

Group 3: Anocracies

Group 4: Periods of interruption, interregnum, and transition

Table 5.7. Democracies results

Instrumental variables (2SLS) regression

Number of obs	10
Wald chi2(4)	34.49
Prob>chi2	0.0000
R-squared	0.7625
Root MSE	104.86

D.GDP per Cap	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
GDP per Cap LD.	0.90936	0.25263	3.60000	0.00000	0.41421	1.40451
LL D1.	-6.99626	4.16453	-1.68000	0.09300	-15.15859	1.166071
DM D1.	99.78988	28.52598	3.50000	0.00000	43.87998	155.6998
PC D1.	-4.33642	9.40266	-0.46000	0.64500	-22.76530	14.09246
C	-50.84025	63.24285	-0.80000	0.42100	-174.79400	73.11345

For instance, the first group which is the democracy group incorporate only 10 observations for Lebanon over the period of 2005-2013, and Tunisia in 2014. Therefore, to have better and more accurate results, additional variables were included in the regression. These additional variables account for the openness and the level of education of the countries by including trade[4] and gross enrollment[5] variables in the regression. The results are consistent with previous analysis in terms of the negative effect of liquid liabilities on GDP per capita. However, its significance level dropped to 10%. Nevertheless, the new regression demonstrates positive and significant effect of deposit money bank assets to deposit money bank assets and central bank assets (%) on economic growth at the 1% significance level. These findings, although not reliable due to the low number of observations available, are consistent with the theory and suggest that improving financial institutions in democracies can lead to economic growth. The latter could be due to the efficiency of financial institutions at allocating resources, optimizing risks management, and monitoring services in democracies where the assets are effectively allocated to elevate the production of the country. Moreover, in the case

[4] Trade (% of GDP), extracted from the World Bank Database
[5] School enrollment, secondary (% gross) extracted from the World Bank Database

of this regression, the countries included could have more stable financial institutions that leads to economic growth compared with the other groups.

Table 5.8. Autocracies results

Instrumental variables (2SLS) regression

Number of obs	183
Wald chi2(4)	9.76
Prob>chi2	0.0447
R-squared	
Root MSE	1006.2

D.GDP per Cap	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
GDP per Cap LD.	0.73146	0.52582	1.39000	0.16400	-0.29913	1.76206
LL D1.	-0.82766	18.51114	-0.04000	0.96400	-37.10883	35.4535
DM D1.	8.64162	29.46010	0.29000	0.76900	-49.09912	66.38236
PC D1.	-41.03221	21.30052	-1.93000	0.05400	-82.78046	0.71605
C	54.53928	80.89868	0.67000	0.50000	-104.01920	213.09780

The second group represents the autocracies with a polity index below 5. This group comprises the following countries, Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Libya, Morocco, Oman, Qatar, Syria, Tunisia, and United Arab Emirates over the period between 1980-2014. However, not all countries have observations for all the 24 years, for example, Tunisia in 2014 is considered a democracy and is included in the first group. The regression of the autocracies includes additional variables accounting for the openness[6] of the country, population[7], and government consumption[8]. The results indicate a negative and significant effect of private credit by deposit money banks to GDP (%) at the 10% significance level indicating that the size of the financial sector affect negatively economic growth.

[6] Trade (% of GDP), extracted from the World Bank Database
[7] Extracted from the World Bank Database
[8] General government final consumption expenditure (% of GDP), extracted from the World Bank Database

Table 5.9. Anocracies results

Instrumental variables (2SLS) regression

Number of obs	126
Wald chi2(4)	8.76
Prob>chi2	0.0675
R-squared	0.16
Root MSE	67.102

D.GDP per Cap	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
GDP per Cap LD.	0.09644	0.12007	0.80000	0.42200	-0.13890	0.33178
LL D1.	-3.68719	1.46350	-2.52000	0.01200	-6.55559	-0.8187844
DM D1.	0.59700	1.15189	0.52000	0.60400	-1.66066	2.854662
PC D1.	3.11248	2.35829	1.32000	0.18700	-1.50969	7.73465
C	37.51379	7.41637	5.06000	0.00000	22.97798	52.04961

The third group including anocracies, Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Morocco, Tunisia, and Yemen, has 126 observations over the period of 1987-2014. This regression includes indicators of openness and government consumption. The results suggest that liquid liabilities have negative and significant effect on GDP per capita in anocracies at the 5% level.

Table 5.102. Periods of interruption, interregnum, and transition results

Instrumental variables (2SLS) regression

Number of obs	26
Wald chi2(4)	129.56
Prob>chi2	0.0000
R-squared	0.8323
Root MSE	560.27

D.GDP per Cap	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
GDP per Cap LD.	0.09421	0.19724	0.48000	0.63300	-0.29238	0.48080
LL D1.	-80.47885	14.75902	-5.45000	0.00000	-109.40600	-51.5517
DM D1.	-37.98285	40.03562	-0.95000	0.34300	-116.45120	40.48551
PC D1.	104.42390	34.89334	2.99000	0.00300	36.03417	172.81350
C	143.61380	114.74040	1.25000	0.21100	-81.27330	368.50090

The results of the fourth group, encompassing the years representing periods of interruption, interregnum, and transition, in Egypt, Iran, Iraq, Kuwait, Lebanon, Libya, Tunisia, and Yemen, suggest that liquid liabilities have negative significant effect on GDP per capita at the 1% level, while private credit by deposit money banks to GDP (%) has positive and significant effect on economic growth at the 1% level. These ambiguous results could be due to the diversity and small size of the sample.

E. Discussion

The negative relationship between financial development and economic growth can be explained by financial repression in the MENA region which can generate financial instability worsening the economy (Goaied, Sassi, 2010). In other words, governments in the MENA region are imposing restrictions on the financial sector to use it as a source of public finance (Creane, Goyal, Mobarak, Sab, 2003) which suggest that any financial development would finance the public debt instead of increasing economic growth. In fact, some studies have shown that a strong degree of financial repression results in lower per capita GDP growth of over 1 percentage point a year (Creane, Goyal, Mobarak, Sab, 2003). Hence, financial repression might constitute an explication of the above results. Another explanation could include the weak stock market in the MENA region which can be accredited to the 1991 Gulf War (Neaime, 2015), or to the small size of the capital market (Ben Naceur and Ghazouani, 2003). This weak equity market is unable to support a sustainable economic development in the region. Ben Naceur and Ghazouani (2003) recommend the privatization of national banks in the MENA countries to improve credit allocation by strengthening credit regulation and reinforcing competition in the banking sector. Additionally, the MENA

region should decrease financial repression to boost financial development in a positive direction to increase economic growth.

Furthermore, the negative relationship linking financial development to economic growth was explained by Berthelemy & Varoudakis (1998) with the theory of threshold where the economy remains blocked in a situation of “poverty trap”. In other words, they assume multiple equilibrium between financial development and economic growth. In fact, financial improvement causes investment efficiency and increases growth, while this growth support the saving and financial sector development leading to a positive effect on the efficiency of financial intermediation generating two steady equilibrium. The equilibrium with standard financial development and high growth «High equilibrium» and the equilibrium with weak growth where the economy fails to develop the financial sector «low equilibrium ». The unsteady equilibrium is between these two equilibriums which defines a threshold of the financial development on the growth. Within this threshold, the economy remains blocked in a situation of "poverty trap" (Goaied, Sassi, 2010).

CHAPTER VI

CONCLUSION

This project investigated the effect of financial development on economic growth in 19 countries of the MENA region over the period between 1980 and 2014. Therefore, the ratio of liquid liabilities to GDP, deposit money bank assets to deposit money bank assets and central bank assets (%), and private credit by deposit money banks to GDP (%) are the three indicators of financial development, and GDP per capita is the indicator of economic growth.

The regression ran is based on the Anderson and Hsiao estimator which first difference the initial equation to account for fixed effect and then takes the second lagged value as an instrument of the differenced dependent variable.

The results of the first regression ran on the 19 MENA region countries suggest that liquid liabilities negatively and significantly affect GDP per capita while the other financial development indicators negatively affect economic growth but with insignificant coefficients. Since the MENA region is very diverse with several of its economies depending on oil production, or accounting for different income levels, or being led by different regimes, additional analysis was conducted by dividing the observed sample in groups based on their oil production, income level, and polity index.

The results of the oil producing countries and non-oil countries indicate that liquid liabilities have a negative and significant effect on GDP per capita, while for the Non-Oil group, deposit money bank assets to deposit money bank assets and central bank assets (%) also has a negative and significant effect on economic growth. These

findings might be due to the fact that the growth of the oil producing economies are not based on the financial development of the country but rather on the oil production.

Moreover, the findings from the upper middle income and lower middle income groups are consistent with previous results suggesting that liquid liabilities negatively and significantly affect economic growth while for the high-income group, financial development indicators do not have significant effect on GDP per capita.

Additionally, the polity group analysis although subject to a low number of observations leading to incomplete results, suggest that democracies deposit money bank assets to deposit money bank assets and central bank assets have a positive and significant effect on GDP per capita. On the contrary, autocracies private credit by deposit money banks to GDP have negative and significant effect, while anocracies results are consistent with the prevailing conclusion of this analysis indicating that liquid liabilities have negative and significant effect on economic growth.

The negative relationship between financial development and economic growth can be due to financial repression, or the still emerging financial sector in the region that did not stabilize yet. Additional characteristics explaining the negative effect of financial development on economic growth in the MENA region could also be examined. The behavior of the MENA population might play a role in these findings. For instance, the theory assumes that all citizens are rational human beings depositing their money in the banks or taking loans solely to save or invest in projects leading to economic growth. However, the behavior of the people might be different whereas the purpose of their savings and credits is not to invest in developing project but rather to consume. The latter might help in the explication of the financial development negative effect on economic growth.

Moreover, the MENA region encompasses developing countries which might suggest that the financial institutions in these countries are still emerging and not fully stabilized. In addition, the region features financial repression, wars, and political distress which impair economic growth. It is worth noting that this paper included financial depth indicators only, meaning that the study focused mainly on the effect of the financial size on economic growth in the MENA region. Further valuable investigation can be conducted with indicators of the financial development stability, accessibility, and efficiency. Furthermore, other variables representing the market sector can be also used as proxies for financial development and might lead to different findings. As noted before, different econometric methodology can also generate different results. Further analysis including indicators of financial stability, efficiency, and accessibility while considering the behavioral aspect, and other characteristics of the region can stimulate interesting evidence for the financial development effect on economic growth in the region.

APPENDICES

APPENDIX I

ANDERSON & HSAIO ESTIMATOR

MENA regression with additional variables in the instrument matrix

Source	SS	df	MS
Model	-83258486	4	-20814621.5
Residual	212211474	323	657001.466
Total	128952988	327	394351.645

Number of obs	328
F(4,323)	8.55
Prob>F	0.0000
R-squared	
Adj R-squared	
Root MSE	810.56

D.GDP per Cap	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
GDP per Cap LD.	0.78855	0.31488	2.50000	0.01300	0.16907	1.40803
LL D1.	-35.80457	7.97956	-4.49000	0.00000	-51.50305	-20.10609
DM D1.	-2.62724	11.40804	-0.23000	0.81800	-25.07069	19.81621
PC D1.	-1.15489	14.36332	-0.08000	0.93600	-29.41236	27.10258
C	24.15448	54.13128	0.45000	0.65600	-82.33992	130.64890

MENA Regression with additional variables in the independents matrix

Source	SS	df	MS
Model	-68318593	6	-11386432.1
Residual	197271581	321	614553.21
Total	128952988	327	394351.645

Number of obs	328
F(6,321)	6.19
Prob>F	0.0000
R-squared	
Adj R-squared	
Root MSE	783.93

D.GDP per Cap	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
GDP per Cap LD.	0.71719	0.34702	2.07000	0.04000	0.03447	1.39991
LL D1.	-35.96226	7.72015	-4.66000	0.00000	-51.15073	-20.77371
DM D1.	-2.61481	11.05221	-0.24000	0.81300	-24.35873	19.12911
PC D1.	-1.70791	13.97698	-0.12000	0.90300	-29.20597	25.79014
Trade	0.05712	0.98526	0.06000	0.95400	-1.88127	1.99551
Inflation	-4.52036	5.21660	-0.87000	0.38700	-14.78340	5.74269
C	60.80134	112.17910	0.54000	0.58800	-159.89780	281.50050

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