

FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: A NEW EMPIRICAL EVIDENCE FROM THE MENA COUNTRIES, 1989-2001

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Abstract. In the last decade, Arab countries achieved significant progress in financial sector reforms in recognition that economic growth is often associated with increasing financial deepening. In light of these developments, it is important to investigate the relationship between financial development and economic growth. This study applies a model developed by Levine in 1997 using panel data for eleven Arab countries during the period 1980-2001. Then an improved version of a model is applied by adding new four financial indicators in the second stage of the empirical test to measure the effect of public credit ratios on economic growth. We apply a Hausman's specification test to examine the fixed and random effects in the panel data. Under the application of Levine (1997) model, the results show that all financial indicators are insignificant and do not affect economic growth. The modified model shows that only public credit to domestic credit (PUBCR) indicator has a significant and positive effect on economic growth, indicating the dominance of the public sector in economic activities and the financial sectors are still underdevelopment and need more efforts to be able to exert its functions effectively in the Arab countries.

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1. Introduction

During the golden period of sixties, seventies and up to the mid-eighties of the last decade, Arab world achieved high rates of growth, good performance and a considerable degree of stability. These great improvements included better infrastructure, higher levels of education and life expectancy and lower rates of poverty. Several factors have led to this development, but the oil revenues being a key factor since its benefits covered the entire Arab world and not the oil producing countries only. On the other hand, the financial system in most Arab countries was tightly regulated and protected from foreign competition by keeping relatively high levels of government controls over the banking and financial system. While those financial and regulatory policies were aimed at providing stability to the financial system, they had their negative effects on the financial system's competitiveness and efficiency. Furthermore, most Arab countries in the last decades tried to keep their exchange rates above their real values and put interest rates and indirect taxes at excessively high levels. This resulted in some serious distortions to their economies. These heavy restrictions reduced the private sector role in economic activities and increased the duties on the governmental sector at a time when the entire world started calling for privatization during the eighties of the last century.

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In light of globalization, telecommunication revolution and a strong trend toward liberalization, Arab countries recognized that depending on oil revenues only is not useful especially after the severe decline in crude oil prices. Thus, Arab countries like other developing countries have embarked, since the early 1990s, on reforming their financial sector. The majority of the Arab countries implemented structural adjustment programs in order to develop, improve, and liberalize their financial and banking sector. This is due to the awareness that developed within the Arab countries has an important role in enforcing and stabilizing their economic growth. Furthermore, an important argument often raised concerns the association between financial development and economic growth since economists hold different opinions regarding the importance of the financial system for economic growth. Some financial economists contend that well-functioning banks spur technological innovation by identifying and funding those entrepreneurs with the best chances of successfully implementing innovative products and production process. In contrast, others suggest that economic development creates demands for particular types of financial arrangements, and the financial system responds automatically to these demands. Moreover, some economists do not believe that the finance-growth relationship is important (Levine, 1997). Although these conflicting views, the preponderance of theoretical reasoning and empirical evidence suggests a positive, first order relationship between financial development and economic growth. There is even evidence that the level of financial development is a good predictor of future rates of economic growth, capital accumulation and technological change. Moreover, this relation provides good explanation of the differences in growth rates between different countries with different financial intermediation levels, which is crucial for economic growth issue.

The purpose of the present paper is to examine the financial development-economic growth relationship in the developing economies of the Arab countries. Accordingly, it is of great interest to investigate this relationship to address three major issues. First, does a positive financial development-economic growth relationship exist in the Arab countries? Second, are the hypotheses employed in the literature to explain the financial development-economic growth relationship applicable to the developing economies of the Arab countries? Finally, what policy implications can flow from the empirical results to enhance financial reform programs in the Arab economies? Answering these questions is of great importance since the recent liberalization and globalization have led most Arab countries to start ambitious programs to improve the operation of the domestic financial systems to be more effective in the economic development process. In addition, providing new empirical evidence on the finance-growth nexus is very important not only for economists and researchers, but also for policy makers who are permanently looking for optimal reform decisions tending to promote financial development not only in the Arab economies, but also for other developing economies with a similar economic structure.

The paper is organized as follows. Section 2 Background and Literature Review, it explores a theoretical background of the link between financial development and economic growth and surveys the main results of the previous studies that have tested this relationship. Section 3 Methodology and Data Description, it provides a brief description of the regression techniques used and presents a description of the variables and the methods used to measure them. Section 4 Empirical Result, it presents a detailed discussion of the regression results. Section 5 Conclusion, it provides an overview of the results of the study.

2. Theoretical Background and Literature Review

A growing body of theoretical and empirical work demonstrates a strong, positive link between financial development and economic growth and the theoretical underpinnings of this relationship can be traced back to the work of Schumpeter (1912)¹ and more recently, to McKinnon (1973) and Shaw (1973). The main policy implication of the McKinnon-Shaw school is that government restrictions on banking systems hinder financial development, and ultimately reduce growth. A flourishing body of empirical work includes three approaches in order to examine this positive relationship. They are: Cross-country studies, individual country studies and firm industry level studies. In this section these three approaches will be reviewed with focus on benefits and limitations².

Cross-country studies. The seminal work in this area is by Goldsmith (1969). Using data from 35 countries from 1860 to 1963, Goldsmith found that a positive association could be observed between economic and financial development if periods of several decades are considered. However, his work has several weaknesses: (i) it involves limited observations on only 35 countries, (ii) it does not control for other factors influencing economic growth, (iii) the size of financial intermediaries may not accurately measure the functioning of the financial system and (vi) it does not identify the direction of causality. Recently, researchers have taken steps to address some of these weaknesses. King and Levine (1993a,b, c) provided evidence for 80 developing countries over the period 1960-1989. They control for other factors affecting long-run growth, and examine the productivity growth channels. Besides that, they use four measures of the level of financial development to more precisely measure the functioning of the financial system than Goldsmith's size measure³. Furthermore, King and Levine (1993 b) study whether the value of financial depth in 1960 predicts the rate of economic growth and productivity improvements over the next 30 years. The regressions indicate that financial depth in 1960 is significantly correlated with each of the growth indicators averaged over the period 1960-1989. Thus, results suggest that the initial level of financial development is a good predictor of subsequent rates of economic growth and economic efficiency improvements over the next 30 years even after controlling for income, education, political stability and measures of monetary and fiscal policy.

Individual-country studies. Country-case studies provide a rich complement to cross-country comparisons. The most influential work in this area is by McKinnon (1973). He studies the relationship between the financial system and economic development in Argentina, Brazil, Chile, Germany, Indonesia, Korea and Taiwan in the post World War II period. He concluded that better functioning financial systems support faster growth. The proponents of this approach criticise empirical studies based on cross-country growth regressions. They argue that these studies do not explicitly confront the issue of causality. In particular, this approach involves averaging out variables over long time periods, and using them in cross section regressions aimed at explaining cross-country variables of

¹ Schumpeter, argued that finance does matter for economic development because financial institutions, by searching for successful innovation projects, finish by encouraging enterprises to produce better and more.

² The literature is quite extensive. For more details see Greenwood and Jovanovic (1990), King and Levine (1993a), Levine (1997) and Greenwood and Smith (1997).

³ These measures will be discussed in detail in section 3.

growth rates. Therefore, these techniques cannot allow different countries to exhibit different patterns of causality. This means that the causality result is only valid on average. Furthermore, cross-country growth regressions suffer from a variety of errors: measurement errors, statistical errors and conceptual errors. Also, since various factors change during the time period of the study (policies, preferences and business cycles), hoping to capture all these changes by certain explanatory variables averaged over time is rather optimistic. Consequently, interpreting the coefficient derives from such studies is rather difficult. Recent empirical literature in country-case studies can be found in Demetriades and Luintel (1996) work. They examine the effects of various types of banking sector controls on the process of financial deepening using data from the Reserve Bank of India. They find that these controls, with the exception of a lending rate ceiling, influence financial deepening negatively, independently of the well-known effect of the real interest rate. Gelbard and Pereira Leite (1999) examine the case of sub-Saharan Africa. They find that some progress has been achieved in terms of modernising the financial sector since the mid 1980's, but conclude that much remains to be done. They also show some empirical evidence supporting the positive relationship between financial depth and growth for sub-Saharan Africa⁴. The positive and significant relationship between financial depth and growth has also been found in studies using pure time series⁵.

Firm-industry level studies. This approach focuses on microeconomic aspects. For example, Rajan and Zingales (1996) analyse the relationship between industry-level growth performance across countries and financial development. They find that industries that rely heavily on external funding grow comparatively faster in countries with well-developed intermediaries and stock markets than they do in countries that start with relatively weak financial systems. Similarly, using firm-level data from 30 countries, Demircug-Kunt and Maksimovic (1996) argue that firms with access to more developed stock markets grow at faster rates than without this access. Furthermore, Rajan and Zingales (1998) tested the financial-growth nexus by focusing on the importance of the differential cost of external finance for firms. The firm's dependence on external finance is defined as the ratio of capital expenditures minus flow cash from operations divided by capital expenditures. The authors focused then on the details of a mechanism by which finance affects growth, providing by the same occasion another test of causality, since they found evidence for a channel through which finance theoretically influences growth. Thus using firm and industrial level data for a broad cross-section of countries present evidence consistent with the view that the level of financial development materially affects the rate and structure of economic development. On the other hand, many studies show that there is negative relationship between financial development and economic growth. For example, De Gregorio and Guidotti (1995), in their empirical study of the long run correlation between financial development and economic growth, using panel data regressions with random effects for Latin American countries during the period 1950-1985, also have found a strong negative correlation between financial development and economic growth. They explained the finding by the effects of experiments of extreme liberalization of financial markets in some Latin American countries followed by their subsequent collapse. Berthélemy and Varoudakis (1998) also found a negative

⁴ For additional country case studies see Park (1993), Patrick and Park (1994) and Fry (1995).

⁵ See Rousseau and Wachtel (1998) and Neusser and Kugler (1998).

correlation between financial development and growth using panel data regressions based on a panel set of 82 countries for the period 1960-1990. They argued that this empirical result might be explained by the existence of “threshold effects”, which state that countries may need to reach a certain level of financial depth (a threshold) before there is a significant effect on growth- associated with the existence of multiple equilibria in the long run between financial development and growth. They assume that the interaction between financial and real sectors generates two stable equilibria: a low equilibrium with weak growth performance and an underdeveloped financial sector and a higher equilibrium with notable growth and normal development of the financial market. Between the two, there is an unstable equilibrium, which defines the threshold effect of the financial development on economic growth.

Besides these three approaches, recent empirical literature has also revisited the old debate on the relative merits of bank-based financial systems (such as Germany and Japan) versus market-based financial systems (such as U.K. and U.S.). Proponents of bank-based systems find that: (i) in highly liquid markets, information is quickly revealed to investors at large, creating a free-rider problem, (ii) small investors are unable to exert corporate control due to superior information of managers and the likely collusion between managers and a few powerful members of the board and (iii) liquid markets make it easy for concerned stockholders to simply sell their shares rather than coordinate pressure against management. Thus, Those proponents argue that the combination of all of these market failures leads to an inefficient allocation of the saving and banks mitigate these failures by their long-term relationships with particular firms.

On the other hand, proponents of market-based systems focus on the weaknesses of bank-based systems, arguing that: (i) large banks tend to encourage firms to undertake very conservative investment projects, and extract large rents from firms, leaving them with low profits and little incentive to engage in new and innovative projects and (ii) shareholders have little oversight over bank managers who control not only banks but also, indirectly through financing, the firms. Moreover, the advocates of this system claim that it provides a various set of financial instruments that allow greater customisation of risk management techniques than in a more standardised bank-based system (Khan and Sehhadji, 2000). Emerging evidence suggests that neither view is fully correct. Levine (1998, 1999 b), James, Caprio and Levine (2000) suggest that establishing a legal environment that strongly protects the right of investors is much more important than comparing between these two systems. Levine (1997) argues that the choice is not either banks or markets because both of them provide complementary financial services to the economy, with both having positive implications for economic growth.

3. Methodology and Data Description

This study applies a modified version of the model developed by Levine (1997) to analyse the financial development-economic growth relationship in the Arab countries. Levine's (1997) study is one of the most influential studies in this area of research, in which it overcomes the major problems in the seminal work provided by Goldsmith (1969). Levine's study systematically controls for other factors affecting long-run income growth, examines the capital accumulation and productivity growth channels, constructs additional measures of the level of financial development, and analyzes whether the level of financial development predicts long-run economic growth, capital accumulation, and

productivity growth. The theoretical approach to finance and growth by Levine has into account the following relationships:

A ----- B ---- C ----- D ----- Growth
A: Market frictions, Information costs and Transactions costs. B: Financial marks and Intermediaries. C: Financial functions, Mobilize savings, Allocate resources, Exert corporate control, Facilitate risk management, Ease trading of goods, services and contracts. D: Channels to growth, Capital accumulation and Technological innovation. Source: Levine(1997)

More specifically, Levine's model uses four measures of financial development and the researcher applied this model in the first stage of empirical test. Then an improved version of a model is applied by adding new four financial indicators in the second stage of the empirical test to measure comprehensively and precisely the relationship between financial development and economic growth in the Arab countries and to talk in the consideration the effect of public credit ratios on economic growth, which is not included in Levine (1997) model since such indicators are significant in the developing economies.

3.1. Methodology: In order to examine the impact of financial development on the economic growth in the Arab countries, a general standard model is used in the following form:

$$G_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 X_{it} + \varepsilon_{it} \quad (1)$$

Where G_{it} is the rate of growth real per capita GDP of country i at time t , FD_{it} is an indicator of financial development, X_{it} represents a matrix of conditional information to control for other factors affecting economic growth in each country, and ε_{it} is the error term. β_0 is a constant term indicating the start level of country growth, β_1 is the rate at which G_{it} changes with respect to FD_{it} , and β_2 is the rate at which G_{it} changes with respect to X_{it} .

To estimate the above panel regression model, three alternative methods are used. First, the Pooled Least Squares (OLS) model, which fundamentally depends on minimizing the sum of squared residuals, is based on the assumption that both intercept and coefficient are constant over time and cross section, and statistical noise captures disturbances over time and cross section. Second, the Fixed Effect model (FEM), also referred to as the "Least-Squares Dummy Variable (LSDV) model", estimates the intercept as coefficient of dummy variables. This model allows intercept to vary for each cross-section and thus account for the individual effect. Finally, the Random Effects model (REM), which is also known as the "Error Components model (ECM)", treats the intercepts as random variables rather than fixed constants. The intercepts are assumed to be independent from the error term and also mutually independent. This study also provides Hausman test to decide between Fixed Effect model and Random Effect model. The null hypothesis underlying this test is that the FEM and REM estimators do not differ substantially. If the null hypothesis is rejected, REM is not appropriate and it is may be better to use FEM, in which case statistical inferences will be conditional on the ε_{it} in the sample. Specifically, if it is assumed that ε_{it} and the X 's (explanatory variables) are uncorrelated, REM may be appropriate, whereas if ε_{it} and the X 's are correlated, FEM may be appropriate (Gujarati, 2003).

3.2. Data and Variables Description. The data used in this study comprise a representative sample of eleven Arab countries, particularly (Algeria, Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Saudi Arabia, Sudan, Syria and Tunisia) over the period of 1980-2001. The data sources for this study are the IMF publication International Financial Statistics (CD-ROM, 2003) and World Bank (CD-ROM, 2003). Not all of the Arab countries were included in the study because of the insufficient data availability for some of them such as UAE, Lebanon, Yemen and others. In addition, some Arab countries faced many political and economic problems in the last years such as Iraq, Kuwait and Libya and this led to missing data for several years. Thus, the researcher tried to choose the best group of the Arab countries that may represent the relationship between financial development and economic growth. From an empirical side it is impossible to construct accurate and comparable measures of the financial services that provided by the financial system for a broad cross-section of countries over the past 21 years. Consequently, to measure the provision of financial services, this research uses eight indicators of financial development each of them has particular strengths and weaknesses as will be discussed below.

First set of financial indicators: The first four measures of financial development are taken from Levine (1997) work, which summarized the seminal work of King and Levine (1993a,b,c) models. Academics and practitioners most commonly use these four measures⁶. The first measure, LIQUID LIABILITIES (DEPTH), measures the size of financial intermediaries and equals liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and non-bank financial intermediaries) divided by GDP. This is a typical measure of “financial depth” and thus of the overall size of the financial intermediary sector. Nevertheless, this measure has some shortcomings (Levine, 1997): It may not accurately gauge the effectiveness of the financial sector in ameliorating informational asymmetries and easing transactions costs. Also, it includes deposits by one financial intermediary in another, which may involve “double counting”. Under the assumption that the size of the financial intermediary sector is positively correlated with the provision and quality of financial services, many researchers use this measure of financial depth (Goldsmith 1969; King and Levine 1993a; and McKinnon 1973). Thus, it is included in this study as one measure of financial intermediary development. The second measure of financial development, BANK, measures the degree to which the central bank versus commercial banks are allocating credit. BANK equals the ratio of bank credit divided by bank credit plus central bank domestic assets. The intuition underlying this measure is that banks are more likely to provide the five financial functions than central banks. There are two notable weaknesses with this measure, however. Banks are not the only financial intermediaries providing valuable financial functions and banks may simply lend to the government or public enterprises (Levine, 1997). The third and fourth measures partially address concerns about the allocation of credit to the private sector. The third measure, PRIVATE, equals the ratio of credit allocated to private enterprises to total domestic credit (excluding credit to banks). The fourth measure, PRIVY, equals credit to private enterprises divided by GDP. The assumption underlying these measures is that financial systems that allocate more credit to private firms are more engaged in researching firms, exerting corporate control, providing risk management services, mobilizing researching savings, and

⁶ See Trabelsi (1998), Khan and Senhadji (2000) and Aziz and Duenwald (2002).

facilitating transactions than financial systems that simply funnel credit to the government or state owned enterprises (Levine, 1997).

Second set of financial indicators: Furthermore, this research extended Levine (1997) model in its second stage where it used another set of four financial indicators to capture specific financial reforms in the Arab countries and to measure the effect of public credit ratios on economic growth, which are not included in Levine (1997) model. This set of indicators is divided into two groups. The first group is called *monetary aggregates* and includes the traditional measure of financial deepening (the level of development of financial markets), which is the ratio of M1 to M2⁷. This ratio provides an indicator of the importance of long-term banking and the degree of sophistication in the financial market. The second group is called *credit aggregates*. The indicators utilized here are the credit to the public sector to domestic credit, credit to the public sector to GDP and the monetary authority (central bank) credit to the financial sector as a percent of domestic credit. The first two indicators point out the dominance of the public sector in the economic activities. Such indicators mainly tell the other side of the story of the credit to private sector ratio, which shows the banking system's orientation to the private sector and the extent to which domestic regulations constrain credit and thus the level of activities in the private sector. It also reflects the importance of the private sector in the economy and the degree of success in obtaining its credit needs. The degree of reliance on monetary authorities by the financial sector is assessed by the third measure. Following the standard practice in the economic growth literature, we proxy the growth rate of real per capita GDP for economic growth.

Control variables: In order to control for the other possible determinants of economic growth not captured by the financial development variables, this study includes five control variables, which were found in most previous studies⁸. They are the ratio of government spending to GDP (EXP1), the openness rate of the economy measured by the ratio of exports and imports over GDP (OPEN), the rate of inflation measured by consumer price index (INF), population growth rate (POP) and finally the initial real GDP per capita in log (PCGDP). Table 1 list the main financial development and output indicators used in the current study. The PCGDP is negative in both Saudia Arabia and Algeria with -0.031 and -0.025 respectively. The highest per capita GDP growth is registered in Egypt, Oman and Tunisia. For the Financial development indicators the first measure the DEPTH which measures the size of the financial intermediary sector. Results shows that overall size of the financial intermediary sector in Jordan is the highest followed by Kuwait, Egypt, Bahrain, Morocco, Sudan, Syria followed by both Tunisia and Algeria respectively. Jordan Financial Sector seems to be highly developed relative to the size of the real activity there. The second measure of financial development, namely, BANK which measures the degree to which central bank versus commercial banks is allocating credit. The figures show that commercial banks

⁷ M1 is the sum of money in circulation and demand deposits, but M2 is the sum of M1, time deposits and saving accounts.

⁸ See King and Levine (1993b), Trabelsi (1998), Levine (1997), Khan and Senhadji (2000) and Aziz and Duenwald (2002).

play a big role in providing the financial functions which are normally provided by the central bank. Kuwait and Sudan average BANK coefficients are so high and play a major role in these economies, other countries show similar but weaker results where their commercial banks supports the functions of the central bank but to a smaller extent.

Table 1. Rates of growth for PCGDP and the first set of financial indicators, 1989-2001

Rates of growth	Algeria	Bahrain	Egypt	Jordan	Kuwait	Morocco	Oman	S.Arabia	Sudan	Syria	Tunisia
PCGDP	-0.031	0.003	0.0272	0.003	0.006	0.0144	0.0290	-0.025	0.0130	0.014	0.020
DEBTH	0.492	0.645	0.870	1.021	0.889	0.593	0.288	0.455	0.563	0.496	0.492
BANK	0.740	0.482	0.509	0.514	0.824	0.599	0.546	0.992	0.999	0.342	0.715
PRIVATE	1.021	4.239	0.365	0.796	0.849	0.613	1.433	4.402	0.246	0.147	1.079
PRIVY	0.405	0.485	0.338	0.667	0.652	0.3290	0.242	0.607	0.075	0.083	0.608

When finding the ratio of credit allocated to private enterprises to total domestic credit, results shows that the credit allocated to private sector is so high in Saudi Arabia is (4.402) , Bahrain (4.239) , Oman (1.433) , Tunisia (1.079), and Algeria (1.021). It is so low in Syria (0.147), Egypt (0.365) and Sudan (0.246) which stresses the fact that these three countries don't put much attention to the development of their financial sectors. On the other hand Jordan (0.796) and Kuwait (0.849) are gearing their credit to the private sector with a considerable amount. The fourth measure of financial development , PRIVY which measures the ratio of credit directed to the private enterprises to GDP shows that Jordan (0.667), Kuwait (0.652) , Tunisia(0.607) and Saudi Arabia (0.608) which are allocating more credit to private firms are more engaged in exerting corporate control, providing risk management and facilitating transactions than other countries do.

4. Empirical Results. This section provides a detailed discussion of the regression results for both the Levine model and the modified model in this study.

4.1. Levine Model. In the first stage of the empirical test, the regression analysis is implemented by using Levine (1997) model, where economic growth measure (annual growth rate of real per capita GDP) is regressed on the four financial development indicators (Depth, Bank1, Private and Privy) with five control variables (PCGDP, EXP1, INF, POP, OPEN). This analysis provides a comparison with Levine's result and previous literature. It also determines the effects of adding another financial variables in the second stage of the empirical test shows the results of applying Levine (1997) model on the Arab countries. It shows that the first three financial indicators (Depth, Bank1, Private) are insignificant using all three methods. The fourth financial indicator (Privy) is significant at 1 percent level using REM and insignificant using FEM with negative coefficient using the two methods. According to the Hausman test, statistic value is significant, so the FEM is the better choice in this regression. Thus, the (Privy) financial indicator is insignificant and does not affect economic growth in the Arab countries. In addition, the (Privy) indicator is significant at 10 percent level using OLS model, but with negative coefficient. According to the control variables, only the population (POP) and the initial per capita income (IPCGDP) are significant with negative coefficient and this is consistent with the growth theory, which states that as the population rate increase more than the capital formulation, the growth rate of per capita GDP decrease.

Table 2 presents the estimations of Levine model.

Table 2. Levine model for the growth per capita GDP on four financial development indicators: Depth, Bank1, Private, Privy.

Financial Indicators	Rate of growth of PCGDP: (D(LGDP))		
	Common	Fixed	Random
Constant	0.084(1.71)***		0.074(1.37)
DEPTH	0.020(0.71)	-0.096(-1.15)	0.013(0.47)
BANK1	0.989E-02(0.31)	0.047(0.83)	0.729E-02(0.15)
PRIVATE	-0.252E-03(-0.37)	-0.273E-03(-0.35)	-0.212E-03(-0.19)
PRIVY	-0.093(-1.69)***	-0.044(-0.75)	-0.093(-2.61)*
IPCGDP	-0.641E-02(-2.20)**	0.769E-02(1.34)	-0.506E-02(-1.32)
EXPI	0.303(1.06)	0.629(1.54)	0.325(-0.93)*
LOG INF	-0.142(0.81)	-0.282(-1.62)	-0.157(-0.93)
OPEN	-0.408E-04(-0.30)	-0.019(-0.51)	-0.629E-03(-0.03)
POP	-1.943(-2.58)*	-1.338(-1.89)**	-1.914(-3.97)*
R2 (Adjusted-R2)	0.152 (0.115)	0.215 (0.138)	0.150 (0.113)
Hausman test	36.97*		

Note: significant differences are remarked by *, ** and *** for 1%, 5% and 10% significance levels respectively. T-values are reported in parentheses.

The results show the weakness of credit provided by the financial systems to the private sector in the Arab countries. Such weakness prevents Arab economies from the benefits of engaging in researching firms, exerting corporate control, providing risk management services, mobilizing researching savings, and facilitating transactions, which are the major functions of the financial system that affect economic growth significantly. The explanation behind this result focuses on the weak role of private sector in economic activities in the Arab countries. This is because most industries in these countries are small and simple and there is strong trend toward services sector, so there is no real production process and productivity in these countries. This weak in production process prevents the existence of any technological innovation, which is the main channel of economic growth. On the other hand, high rates of growth during sixties, seventies and up to the mid eighties due to the high revenues of oil exports whose benefits spilled over the entire Arab region and not only the oil producing countries, spurred by the dramatic manner in which labour movements were liberalized and became the key equilibrating mechanism towards regional integration, along with significant aid transfers to the lower income Arab countries. Many studies attempted to solve this paradox (non significant financial-growth link) by talking the investment rate as a dependent variable. Recent studies show a significant relationship between the investment ratio and the financial indicators. Furthermore, it was found that such relationship might be a good reason to consider that the nature of the financial-growth link hinges on the investment behavior of the private sector in each economy. In other words, the insignificant correlation between financial development and economic growth may be explained by the lack of innovative entrepreneurial activity in developing countries. Other hypotheses were tested to account for this paradox by considering the importance of foreign trade in developing countries⁹.

This study tried to take this hypothesis in consideration, but large portion of the data for most Arab countries was missing, thus preventing the researcher from applying such

⁹ See for example Trabelsi (1998) and Aziz and Duenwald (2002)

models for the Arab countries. Although non ability to apply such hypotheses, most economic and financial indicators in the Arab World support the need to activate the private sector role in the financial development process. Results in the first stage of the empirical test are inconsistent with the findings of Levine where Levine's results do not show only that the financial development coefficients statistically positive and significant, but also the sizes of the coefficients imply an economically important relationship. Many studies explained the positive effect of financial development on economic growth with panel data regressions in Levine (1997), King and Levine (1993a) and Haslag and Koo (1999) studies by the presence of several developed countries in the sample besides developing ones, which is not the case in this study. Therefore, this study adds new four financial indicators in the second stage of the empirical test. These indicators measure the public credit ratios and central bank credit ratio, which are not included in Levine (1997) model. In addition, these indicators may explain why there is no relationship between bank and private credit ratios and economic growth in the Arab countries. Regarding control variables, it is important to mention that the role of other variables, such as the impact of human and industrial capital, has been analysed in some interesting econometric studies based on international samples, which include MENA countries, as in Guisan, Aguayo and Exposito(2001) and Guisan and Exposito(2004), among others. The former study shows that the main positive effect of the educational level of population on economic development is to lower the rate of population growth and increase the rate of PCGDP growth, while the latter study focus particularly on the positive role that industrial development has generally to foster non industrial development, particularly on services and building sectors.

4.2 The Modified Model. The second stage of the empirical test aims to improve the results and find the financial variables that determine economic growth in the Arab countries. It includes three financial indicators (Bank1, Private, Privy) from Levine (1997) model and new four financial indicators, which are the ratio of M1 to M2 and credit aggregates indicators. The (M1M2) indicator is used instead of the (Depth) indicator as another proxy for liquid liabilities of financial system because the (Depth) indicator is insignificant in the first stage of empirical test. The credit aggregates indicators are used to examine the effect of central and public credit on economic growth, which are not included in Levine (1997) model and may have significant effect in such developing countries. Table 3 shows the regression results of applying the modified model on the Arab countries. As in the first stage of the empirical test, the (Bank1, Private and Privy) indicators are insignificant. Regarding the new set of indicators, the (M1M2, PubGDP and Central) financial indicators are also insignificant using all three methods.

The only significant financial indicator with positive coefficient is the (Pubcr), which is significant at 5 percent level using OLS model and FEM. This indicator is insignificant using REM, but Hausman statistic is significant, so the FEM gives the correct result in this regression. These results incorporate important interpretation for the financial situation in the Arab countries. The positive relationship between the credit to public sector ratio and economic growth indicates the dominance of the public sector in the economic activities and financial system provides credit to the public institutions. This means financial systems in the Arab countries do not execute its functions properly especially in saving mobilization, evaluating investments and managing risk, which affect technological innovation and economic growth in the long-run. Late and slowly

privatisation programmes, controlling public sector on the major institutions such as electricity, telecommunication, oil and airports contribute significantly in the dominance of the public sector in the economic activities. Thus, public sector is more productive than private sector in the Arab countries and this reflects the lack of new and innovative forms of financial savings and less developed financial sector.

Table 3: Modified model for growth per capita GDP

Financial Indicators	GPCGDP		
	Common	Fixed	Random
Constant	0.125(1.94)**		0.125(1.65)
BANK1	-0.030(-0.66)	0.030(0.43)	-0.031(-0.47)
PRIVATE	-0.216E-03(-0.34)	-0.155(-0.19)	-0.215E-03(-0.20)
PRIVY	-0.078(-1.69)***	-0.089(-1.37)	-0.078(-2.49)*
M1M2	-0.038(-0.95)	0.060(0.86)	-0.038(-1.08)
PUBGDP	0.027(0.99)	0.142(0.03)	0.027(1.16)
PUBCR	0.103E-03(2.14)**	0.145(2.00)**	0.103E-03(0.62)
CENTRAL	-0.015(-0.75)	-0.014(-0.34)	-0.015(-0.47)
IPCGDP	-0.462E-02(-1.68)***	0.011(1.35)	-0.458E-02(-0.125)
EXP1	0.278(0.96)	0.477(1.14)	0.279(2.95)*
INF	-0.198(-1.06)	-0.335(-1.78)***	-0.199(-1.10)
OPEN	0.306E-02(0.17)	-0.017(-0.39)	0.302E-02(0.16)
POP	-1.802(-2.47)*	-1.427(-1.89)**	-1.799(-3.77)*
R2 (Adjusted-R2=)	0.168 (0.118)	0.209 (0.119)	0.168 (0.118)
Hausman test	15.280*		

Note: significant differences are remarked by *, ** and *** for 1%, 5% and 10% significance levels respectively. T-values are reported in parentheses.

The results are generally weaker when a time dimension (panel data) is introduced in the model and there are several sources for such weakness.

First, the weaker explanatory power of these financial indicators in panels may reflect the inadequacy of the linear specification to capture growth dynamics. Indeed, recent theoretical work shows that this relationship may well be non-linear.¹⁰

Second, the concave relationship between financial development and growth simply reflects conditional convergence, that is poor countries tend to grow faster than rich ones. To the extent that poor countries have less developed financial markets than rich ones, the negative sign on the square of the financial development indicator may capture the slowing growth path of advanced economies, which is not completely captured by the log of initial income included in the growth equations.

Third, financial indicators may not precise enough to capture the changing structure of financial markets in a particular country. While the level of financial development may explain the level of growth, it is precisely changes in the financial structure that are related to changes in growth for a given country. If the indicators do not adequately capture these changes, they will not explain a large portion of the time variation in growth.

¹⁰ See for example Greenwood and Jovanovic (1990), Huybens, and Smith (1998).

5. Conclusion

The purpose of this study is to examine the link between financial development and economic growth for a set of eleven Arab countries during the period 1980-2001 using panel data. Several conclusions emerge from this investigation. First, using Levine (1997) model in the first stage of the empirical test indicates that there is no significant and strong positive relationship between the most common used financial indicators (Depth, Bank1, Private, privy) and growth rate per capita GDP in the Arab countries and this result is inconsistent with theoretical hypothesis. Second, constructing the modified model by adding new four financial indicators in the second stage clarifies that the public credit ratio (Pubcr), which not included in Levine (1997) model is the only financial indicator that affects economic growth in the Arab countries in this study. This result indicates that financial systems in the Arab countries do not allocate credit to private firms, but funnel credit to the government or state owned enterprises in most cases. This can be attributed to the weakness of private sector, which depends on services sector and the nonexistence of real investments that depends on new technology. Third, financial systems in the Arab countries need restructuring to be more effective and able to execute its functions that affect savings rate and technological accumulation, which lead to economic growth in the long run. Finally, it is not necessarily that a certain model is applicable for all countries and in all cases. Therefore, it is important to consider all differences in economic and financial conditions when studying crucial economic relationship such as financial development-economic growth nexus because many important decisions will depend on it and affect significantly in the future of these countries.

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