

## **Financial Deepening and Economic Growth: The Case of Jordan**

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*This study investigates the dynamic relationship between financial deepening and economic growth in Jordan over the period (1992-2014). Vector auto regressive regressions, Granger causality and Johansen-Juselius cointegration tests are employed to achieve the objectives of the study. Using quarterly data, the results indicate no statistically significant effect of financial deepening on economic growth on the short run. However, the cointegration tests show a statistically significant long run equilibrium relationship between the two variables regardless of the proxy used for financial deepening. Moreover, the Granger causality test show a bi-directional causality between economic growth and financial deepening when the latter is measured by the amount of credit granted to private sector. However, a one way causal relationship from the economic growth to financial deepening is found when the amount of deposits and money supply (M2) are used as proxies of financial deepening. These findings have important implications to academicians and policy makers in Jordan.*

### **INTRODUCTION**

Financial deepening is defined as the increased provision of financial services with a wider choice of services geared to all levels of society. It generally means an increased ratio of money supply to GDP, in other words, it refers to liquid money. The more liquid money is accessible in an economy, the more chances exist for continual growth (Shaw, 1973). Financial deepening stimulates higher investments, faster growth and more rapidly rising living standards.

Jordan is a developing non-oil-producing country with limited natural resources and water. The Jordanian economy is one of the smallest in the Middle East with a GDP of JD 23, 851.6 million and a population of 6,530,000 (central bank of Jordan, 2013). The commodity producing sector represents 33.4% of the GDP while the greatest percentage is to the service producing sectors which represent 66.6% of the GDP according to the statistics of year 2013 (central bank of Jordan, 2015). Jordan is rapidly growing, both as a result of its population demographic and due to an influx of refugees over the past decades. On the other hand, Jordan has a financially sound distinguished banking system. The Jordanian financial stability report (2013) revealed that the size of the banking system comprises approximately 94.0 % of the size of the financial sector, and hence, banks are considered the main component of the financial sector in Jordan. The banking sector in Jordan is considered as one of the main pillars of the Jordanian economy. It is well capitalized, highly regulated and maintaining high levels of profitability,

expansion and growth over years although of the overabundance of events that have been taking place since the beginning of the year 2011 following what is called “the Arab spring”.

The linkage between financial deepening and economic growth is well documented in both the theoretical and the empirical literature. A better understanding of this relationship has important implications to academicians, practitioners and policy makers. Hence, the financial system mobilizes pools and channels funds into productive capital and by doing so it contributes to economic growth. On the other hand, if the linkage goes from economic growth to financial development, then under this logic, the economic growth would increase demand for sophisticated financial instruments, which in turn leads to development in the financial sector (Levine, 2005). This study investigates the dynamic relationship between financial deepening and economic growth in Jordan over the period (1992-2014). The remaining of the study is organized as follows: Section 2 reviews the literature, Section 3 describes data and Methodology, Section 4 reports the results of analysis and Section 5 concludes.

## LITERATURE REVIEW

A huge amount of literature has examined the relationship between financial development and economic growth. The early evidence starts by the most influential works in this topic (Goldsmith, 1969; Mckinnon, 1973; Shaw, 1973). Goldsmith (1969) investigates the effect of financial structure on development in 35 countries over the period (1860-1963). He documents a positive relationship. Consistently, Mckinnon (1973) inspects the same issue in Argentina, Brazil, Chile, Germany, Indonesia, Korea and Taiwan in the post World War II period. He finds that better functioning financial systems stimulate faster growth. Shaw (1973) introduces supporting evidence. He shows that financial intermediaries promote investment and raise output growth through borrowing and lending.

The succeeding papers use different models, techniques and control variables on both the aggregate and individual country levels and find a positive impact of financial development on economic growth (Bencivenga and Smith, 1991; King and Levine, 1993b; Pagano, 1993; Benhabib and Spiegel, 2000; Levine *et al.*, 2000; Rioja and Valev, 2004). King and Levine (1993a) study the relationship between financial development and output growth for 80 countries over the period (1960-1989). They document a contemporaneous relationship. Moreover, they conclude that the predetermined component of financial development is a good predictor of long-run growth over the next 10 to 30 years. Darrat (1999) investigates the role of financial deepening in economic growth in three middle-eastern countries (Saudi Arabia, Turkey and the United Arab Emirates). He focuses on the causal relationship between the two variables. His findings generally support the view that financial deepening is a necessary causal factor of economic growth. However, the strength of the evidence varies across countries and across the proxies used to measure financial deepening. Darrat (1999) argues that the causal relationships are also predominately long-term in nature. Calderon and Liu (2002) employ the Geweke decomposition test (Geweke, 1982) on pooled data of 109 developing and industrial countries to examine the direction of causality between financial development and economic growth over the period (1960-1994). They find a bi-directional causality between the two variables. Moreover, they argue that financial deepening contributes more to the causal relationships in the developing countries than in the industrial countries. Alzubi *et al* (2007) investigate the relationship between financial development and economic growth in MENA countries over the period (1989-2001). Using panel data analysis, their results show that all financial indicators are insignificant and do not affect economic growth in these countries. Alternatively, the public sector is found to dominate economic activities. The authors argue that the financial sectors are still underdevelopment and need more efforts to be able to exert their functions effectively in the Arab MENA countries. Apergis *et al.* (2007) inspect whether a long-run relationship between financial development and economic growth exists employing panel integration and cointegration techniques for a dynamic heterogeneous panel of 15 OECD and 50 non-OECD countries over the period 1975–2000. Their findings support the existence of a single long-run equilibrium relationship between financial deepening, economic growth and a set of control variables.

In Jordan, Abu-Mhareb and Al-Fyoumi (2011) examine the causal relationship between stock market, banks and economic growth in order to find whether financial development is supply-leading or demand-following over the period (1992-2010). The results of the study do not support the hypothesis that financial development lead to changes in economic growth in Jordan. However, they provide evidence that the effect of the local macroeconomic variables (trade openness and industrial production) on the economic growth is more important than that of financial indicators. In addition, Granger causality test confirms the presence of a significant unidirectional causal relationship running from economic growth to bank credit granted to private sector in Jordan. Aljarrah *et al.* (2012) examine the impact of financial development on economic growth in Jordan over the period (1992-2011). They find that financial development as measured by the ratio of banking sector assets as percent of GDP, ratio of currency outside banks as percent of narrow money supply and ratio of private sector credit as percent of total banking sector credit is significantly correlated with economic growth. However, their results indicate a causal relationship only from the ratio of banking sector assets as percent of GDP to the economic growth. Masoud and Hardaker (2013) investigate the role of the financial market in economic growth over the period (1980-2012). Based on causality and cointegration tests, their results indicate a bi-directional relationship between the two variables on both the short and long run. However, they argue that the financial market in Jordan is not a leading part of the economic development process. Consistently, Elian and Sulaiman (2014) find a limited bi-directional causality relationship between equity market and economic growth over the period (1980-2009). Abu Alfoul *et al.* (2014) examine the causal relationship between financial development and economic growth for the period 1965 to 2004. Using Toda and Yamamoto (1995) Granger-no-causality model, their results reveal that there is a unidirectional Granger causality from economic growth to financial development when the latter is measured by the ratio of the credit granted to private sector to GDP.

## DATA AND METHODOLOGY

Our data set consists of the quarterly observations of the GDP per capita, total credit granted to private sector, total deposits, money supply (M2), lending interest rate, consumer price index, total amount of exports and imports and government expenditures over the period (1992-2014). The variables of the study are defined as follows:

*Economic Growth:* economic growth (**GDP**) is measured by the growth rate in per capita GDP.

*Financial deepening:* Financial deepening is measured by three proxies, the total credit granted by banks to private sector divided by the GDP (**Credit**), the total deposits to GDP (**Dep**) and the money supply (M2) to GDP (**MS**).

*Control variables:* the control variables include inflation (**INF**) calculated as the percentage change in the consumer price index, interest rate (**INT**) measured as the lending rate, the degree of openness (**Open**) measured as the total imports and exports divided by the GDP and the government expenditures as a percentage of GDP (**EXP**).

In order to examine the short run dynamic effect of financial deepening on economic growth, we employ a vector autoregressive regression. The following VAR is estimated three times each using a certain proxy of financial deepening:

$$GDP_t = \alpha + \phi_1 GDP_{t-1} + \dots + \phi_p GDP_{t-p} + \beta_1 FD_{t-1} + \dots + \beta_p FD_{t-p} + \delta_1 Cont_{t-1} + \dots + \delta_p Cont_{t-p} + e_t$$

Where *GDP* denotes economic growth. *FD* denotes financial deepening. *Cont* denotes the control variables which include the lagged values of INF, INT, Open and EXP. Akaike Information Criteria is employed to determine the number of lags in VAR.

Thereafter, Granger causality tests are performed as follows:

$$GDP_t = \alpha_1 + \sum_{i=1}^n B_i FD_{t-i} + \sum_{j=1}^m \lambda_j GDP_{t-j} + e_{1t}$$

$$FD_t = \alpha_2 + \sum_{i=1}^n \theta_i GDP_{t-i} + \sum_{j=1}^n \phi_j FD_{t-j} + e_{2t}$$

The long run equilibrium relationship between economic growth and financial deepening is examined by the Johansen-Juselius cointegration test. Johansen (1988) and Johansen and Juselius (1990) suggested two likelihood ratio tests to determine the number of cointegration vectors. These tests are trace and maximum eigen value, which are estimated as follows:

$$\text{Trace Test} = \lambda_{\text{Trace}}(r) = -T \sum_{i=r+1}^p \ln(1 - \lambda_i)$$

$$\text{Maximum Eigen Value Test} = \lambda_{\text{Max}}(r, r+1) = -T \ln(1 - \lambda_{r+1})$$

Where  $-T$  is the number of observations.  $\lambda_i$  is the  $i^{\text{th}}$  largest eigen value.  $r$  is the number of cointegrations. The null hypothesis of trace test is that there are at most  $r$  cointegration vectors. In other words, the number of cointegration vectors is less than or equal to  $r$ . The null hypothesis for maximum eigen value test is that there are  $r$  cointegration vectors.

## RESULTS OF ANALYSIS

Table 1 reports the results of the Augmented Dickey-Fuller test of the study variables. All the test statistics are significant so the null hypothesis of a unit root is rejected for all the variables investigated. Thus, the time series are stationary. The reason is that the first percentage differences are used for calculating the growth rate in the variables of the study. Table 2 shows the estimation results of the three VAR models. The results indicate no statistically significant short term effect of financial deepening on economic growth regardless of whether the financial deepening is measured by the total credit granted to private sector or total bank deposits or the money supply (M2). These results are consistent with the findings of (Alzubi *et al*, 2007) who find that the financial sectors are still underdevelopment and do not strongly promote economic growth in 17 Arab MENA countries. Our results are also in harmony with (Abu-Mhareb and Al-Fyoumi, 2011) who find that the macroeconomic factors are more important in explaining economic growth than the financial development indicators in Jordan.

Table 3 reports the results of the Granger causality tests between economic growth and financial deepening. The results indicate a bi-directional causal relationship between economic growth and financial deepening when the financial deepening is measured by the total credit granted to the private sector. However, the causality goes only from the economic growth to financial deepening when the financial deepening is measured by the total bank deposits and the money supply (M2). Our results are in agreement with Calderon (2002) who find a bi-directional causality between financial deepening and economic growth in 109 developing and industrial countries using both the percentage of M2 to GDP and the amount of bank credit granted to private sector to GDP as proxies of financial deepening. However, our findings are contrasting with a recent study for (Abu Alfoul *et al.*, 2014) who document a uni-

directional Granger causality from economic growth to financial development in Jordan when the financial deepening is measured by the ratio of the credit granted to private sector to GDP.

Tables 4-6 report the results of the Johansen- Juselius cointegration test. The results show that economic growth and financial deepening reach equilibrium at the long run. The statistics of both the trace and maximum eigen tests are statistically significant when using any of the three proxies of financial deepening. These findings are consistent with (Darrat, 1999; Apergis *et al.*, 2007; Masoud and Hardaker, 2013) who provide evidence supporting the long run cointegration between financial development and economic growth in a vast number of developed and developing countries.

Overall, the results of the study point out a statistically significant long run relationship between economic growth and financial deepening. However, no apparent short term effect is documented between the two variables. Indeed, this is expected in a developing country like Jordan where a gap exists between the economic growth and financial development at the short run.

**TABLE 1**  
**AUGMENTED DICKEY-FULLER TEST STATISTICS**

Variable	t-Statistic	Prob
GDP	-4.1532	0.0014
Credit	-3.3040	0.0177
Dep	-4.8405	0.0001
MS	-4.4635	0.0005
INF	-9.6180	0.0000
INT	-2.9627	0.0425
Open	-10.8389	0.0001
EXP	-3.2876	0.0185

**TABLE 2**  
**VECTOR AUTOREGRESSIVE REGRESSIONS**

Variables	GDP	Variables	GDP	Variables	GDP
GDP(-1)	0.4987	GDP(-1)	0.0314	GDP(-1)	-0.0871
	-0.2876		-0.2643		-0.3126
GDP(-2)	-0.8960	GDP(-2)	-0.6241	GDP(-2)	-0.5011
	-0.2649		-0.2622		-0.3088
CREDIT(-1)	0.7020	DEP(-1)	0.3175	MS(-1)	0.1732
	-0.2583		-0.2963		-0.3425
CREDIT(-2)	-0.2168	DEP(-2)	0.1348	MS(-2)	0.2726
	-0.2662		-0.2935		-0.3393
INF(-1)	-0.4211	INF(-1)	-0.3633	INF(-1)	-0.3527
	-0.3166		-0.3204		-0.3284

INF(-2)	0.2302 -0.3288	INF(-2)	0.3696 -0.3339	INF(-2)	0.3639 -0.3405
INT(-1)	-0.3324 -0.2205	INT(-1)	-0.2924 -0.2353	INT(-1)	-0.3164 -0.2339
INT(-2)	-0.0219 -0.2128	INT(-2)	0.0495 -0.2232	INT(-2)	0.0437 -0.2236
OPEN(-1)	-0.0107 -0.0487	OPEN(-1)	-0.0257 -0.0520	OPEN(-1)	-0.0252 -0.0517
OPEN(-2)	-0.0413 -0.0501	OPEN(-2)	-0.0512 -0.0523	OPEN(-2)	-0.0537 -0.0523
EXP(-1)	0.2189 0.0318	EXP(-1)	0.2239 0.0376	EXP(-1)	0.2643 0.03927
EXP(-2)	0.1814 0.0218	EXP(-2)	0.2074 0.0276	EXP(-2)	0.2232 0.02927
C	0.0111 -0.0082	C	0.0122 -0.0106	C	0.0130 -0.0108
R-squared	0.6167	R-squared	0.5861	R-squared	0.5838
Adj. R-squared	0.5676	Adj. R-squared	0.5330	Adj. R-squared	0.5305

**TABLE 3  
GRANGER-CAUSALITY TESTS**

Null Hypothesis	F-Statistic	Prob.
CREDIT does not Granger Cause GDP	4.3048	0.0166
GDP does not Granger Cause CREDIT	7.1831	0.0013
DEP does not Granger Cause GDP	1.1755	0.3137
GDP does not Granger Cause DEP	3.4712	0.0356
MS does not Granger Cause GDP	0.8963	0.4704
GDP does not Granger Cause MS	8.7663	0.0000

**TABLE 4  
COINTEGRATION TEST BETWEEN GDP AND CREDIT**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value	Prob
None	0.7711	148.3008	15.4947	0.0001
At most 1	0.1746	17.0815	3.8415	0.0000

  

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value	Prob
None	0.7711	131.2193	14.2646	0.0001
At most 1	0.1746	17.0815	3.8415	0.0000

**TABLE 5  
COINTEGRATION TEST BETWEEN GDP AND DEP**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value	Prob
None	0.7929	171.2665	15.4947	0.0001
At most 1	0.2951	31.1285	3.8415	0.0000

  

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value	Prob
None	0.7929	140.1379	14.2646	0.0001
At most 1	0.2951	31.1285	3.8415	0.0000

**TABLE 6  
COINTEGRATION TEST BETWEEN GDP AND MS**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value	Prob
None	0.7923	164.9160	15.4947	0.0001
At most 1	0.2452	25.0358	3.8415	0.0000

  

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value	Prob
None	0.7923	139.8802	14.2646	0.0001
At most 1	0.2452	25.0358	3.8415	0.0000

## CONCLUSIONS

The dynamic relationship between economic growth and financial deepening in Jordan is investigated. The study uses quarterly data over the period (1992-2014). Economic growth is measured by the growth rate in GDP per capita while three proxies are employed for the financial deepening. These proxies are the total bank loans granted to private sector, the total bank deposits and the money supply (M2) as percentages of GDP. Vector auto regression results show no statistically significant short term effect of financial deepening on economic growth in Jordan for all the proxies of financial deepening. On the other hand, economic growth and financial deepening are cointegrated at the long run as indicated by the Johansen- Juselius conitegration test of the three proxies of financial deepening. Moreover, there is a

statistically significant two-way causality between the total credit and economic growth while a one-way causality is documented between the economic growth and the other two proxies of financial deepening. These findings have important implications for academicians, practitioners and policy makers in Jordan.

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