



Banking Development and Economic Growth in Jordan: Evidence from VECM Model

By:

Imane Yousfi

Assistant Professor in Management and Finance
Department at Setif1 University

Abstract

This study aims to investigate the short as well as the long run and dynamic relationship between banking development and economic growth in the case of Jordan. By employing the granger causality test, the Cointegration test and the Vector Error Model (VECM), to see whether the financial system influences economic growth and whether growth transforms the operation of the financial system in the long run. The data used in this study were collected from the period of 1993 to 2015. The GDP growth rate is used as a proxy of economic growth, whereas, total financing, total deposits and investments (banking size) are expressed as ratios of GDP and these variables are used to measure the banking development in Jordan.

The results reveal that all the series are non-stationary at their levels but stationary at their first difference and they are integrated for order one $I(1)$. Furthermore, the results from the granger causality test for the short run and the VECM for the long run reveal that both financing and investments in Jordanian banks have a statistical significant impact on the economic growth in both short and long run. However, the deposits show an insignificant impact on the economic growth in both short and long run. Moreover, the economic growth doesn't have any significant impact on the financing, the total deposits and the total investments in Jordanian banks.

Key Words: Banking Sector Development, Economic Growth, VECM, Granger Causality, Jordan

الملخص

تهدف هذه الدراسة إلى تقصي العلاقة الديناميكية بين النمو المصرفي والنمو الاقتصادي في الأردن على الأمدين الطويل و القصير من خلال استخدام اختبار السببية جرانجر، واختبار التكامل المشترك ونموذج متجه تصحيح الخطأ (VECM)، لمعرفة ما إذا كان النظام المالي يؤثر على النمو الاقتصادي والنمو يحول التأثير إلى النظام المالي على المدى الطويل. تم جمع البيانات المستخدمة في هذه الدراسة من الفترة الممتدة من 1993 إلى 2015 كما تم استخدام معدل نمو الناتج المحلي الإجمالي كمؤشر للنمو الاقتصادي وكمتغير تابع أما المتغيرات المستقلة فتمثلت في التمويل البنكي الكلي، إجمالي الودائع وإجمالي الاستثمارات تم التعبير عنها كنسب من الناتج المحلي الإجمالي وقد استخدمت هذه المتغيرات لقياس النمو.

أظهرت النتائج أن السلاسل الزمنية للمتغيرات غير مستقرة عند مستوياتها الأصلية ولكن مستقرة عند الفرق الأول. أما نتائج اختبار جرانجر للسببية على المدى القصير و VECM على المدى الطويل فكشفت أن كلا من التمويل والاستثمار في البنوك الأردنية لها تأثير معنوي احصائيا على النمو الاقتصادي على الأمدين القصير والطويل. على عكس الودائع التي لم يكن لها أي تأثير ذو دلالة احصائية على النمو الاقتصادي في كل من المدى القصير والطويل. أخيرا لم يكن للنمو الاقتصادي أي تأثير ذو دلالة احصائية على كل من التمويل وإجمالي الودائع وإجمالي الاستثمارات في البنوك الأردنية.

الكلمات الدالة: النمو المصرفي، النمو الاقتصادي، نموذج متجه تصحيح الخطأ، جرانج للسببية، الأردن.

Introduction

The health of the financial system has an important role in any nation as its failure can disrupt the economic development of the country. There is no doubt that banking sector generally plays a major role in developing and enhancing the economic condition via funding most of strategic sectors, if it is not all. Profit is the foremost motive for everyone to put an immense effort and make the business successful, since profit is a central source of (re) in-

vestment funds. When it comes to banking sector, the importance of banks' profitability can be appraised at the micro and macro levels of the economy

In general the study of banking development is important and may be motivated by several attributes.

Firstly, banks are the backbone of the global economy, providing capital for innovation, infrastructure, job creation and overall prosperity so; an improvement in banks' profitability helps in increasing the chance of survival in deregulated and competitive markets. This is particularly relevant for Islamic banks as they compete head-on with conventional /traditional commercial banks in many jurisdictions. Secondly, banks also play an integral role in society, affecting not only spending by individual consumers, but also the growth of entire industries. Thirdly, the importance of banks can be appraised at the micro and macro levels of the economy. At the micro level, profit is the essential prerequisite of a competitive banking institution and the cheapest source of funds. It is not merely a result, but also a necessity for successful banking in a period of growing competition on financial markets. At the macro level, a sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. The importance of banks at both the micro and macro levels has made researchers, academics, bank managements and bank regulatory authorities concerned to develop considerable interest in the impact of banks development on the overall economic growth.

Moreover, the role of financial sector development in eco-

economic growth has become a major topic of empirical research over the last decade. Most cross-section oriented studies (for example Levine, Loayza and Beck 2000, Singh, Singh and Weisse 2000...) base their analyses on a broad sample of industrial economies as well as developing countries. Thus, the need to stimulate and manage economic growth is a global topic of up most importance in advanced, emerging, and less-developed countries. Banking sector development may directly increase growth by improving the quality of financial services and increasing funds available, or indirectly by improving the efficiency of financial intermediaries, both of which may reduce the cost of financing, in turn, increase capital accumulation and economic growth.

This study aims to investigate the long run and dynamic relationship between banking development and economic growth in the case of Jordan. By employing the Cointegration test and the Vector Error Model to see whether the financial system influences economic growth and if growth transforms the operation into the financial system in the long run. The data used in this study were collected from the period of 1993 to 2015. Finally, this paper is organized as follows Section 2 mentions the study questions and objectives. Section 3 outlines the basic theory on finance and growth in the Jordanian economy, and reviews relevant empirical literature that deals with the financial development and the economic growth. Section 4 discusses some methodological issues for empirical research and states the econometric model. Section 5 analyzes the summary statistics of data and gives an overview of the econometric results in this section also the results are dis-

cussed and interpreted. In the sixth section the researcher provided a conclusion that summarizes the main objective and findings

Study Aims and Questions

The aim of this study is to investigate the issue of financial development and economic growth in Jordan, and to determine the contribution of different banking institutions to growth, to reach this main aim the following sub objectives are highlighted and addressed:

- To test the long run relationship among economic growth and banking development in Jordan by using Johansen approach to Cointegration and Vector Error Correction model.
- To test the short run relationship among relationship among economic growth and banking development in Jordan and to see the direction of causality among these variables by applying the Granger Causality test.

Therefore this paper is intended to answer the following questions:

1. Do different types of banking institutions affect economic growth?
2. What are the financial determinants of the economic growth?
3. Does economic growth transform the influence to the financial system in the short run?

Study Background

In this section the researcher provides some insights about the :Jordanian economy as follows

1. Banking Sector in Jordan

During the past few decades, Jordan has witnessed a considerable growth that dominated all economic sectors of the country, the result of which was a widespread economic and social prosperity. However, the progress, that the Jordanian banking sector experienced, was the most prominent and explicit compared to other sectors. According to the World Bank (2003) Jordan is considered as a bank-based financial system where banks play a major role in financing the economy's activities. The banking sector in Jordan momentarily stands as a highly developed body, which comprises various financial institutions managing a considerable volume of financial assets, which are gainfully employed within all economic sectors of the country. Moreover, Banks in Jordan are regulated by the Central Bank of Jordan (CBJ), whose role is to protect depositors and shareholders, through ensuring the soundness of the banking sector by monitoring capital adequacy levels, requiring the application of international auditing and accounting standards, and monitoring the solvency and liquidity of banks.

Jordanian banks carry out their operations through a network of 558 branches and 79 representative offices throughout the Kingdom. Accordingly, the index of population to the total number of operating branches was about 10.2 thousand citizens per branch at year-end 2007. On the other hand, the number of branches of the Jordanian banks operating abroad at the end of 2007 was 129 branches and 24 representative offices, of which 57 branches and 12 representative offices were operating in Palestine (CBJ, 2008). Jordan's banking sector has historically moved from

strength to strength, posting impressive results along the way despite political and economical instability affecting the region. This growth was a consequence of effective management practices and a well regulated operating environment spearheaded by the Central Bank of Jordan (CBJ). Banking in Jordan traces back to the early 1900's with the establishment of the "Ottoman Bank" in 1925. Soon after, the largest commercial Palestinian bank "The Arab Bank" was relocated to Amman as a result of the 1948 Arab-Israeli war and a number of local and foreign banks subsequently started their operations in Jordan.

Benefiting from favorable economic conditions, the banking sector has undergone major progress, as deposits and loans more than doubled between the mid-1970's and the early 1980's. During the same period the number of financial institutions tripled. The government encouraged the expansion of banking services as a key driver to its economic development policy and took a number of measures to enhance it, beginning with the deregulation of interest rates in 1988, which helped attract deposits from other Arab nations and remittances of many Jordanians who had never used banks before.

Since 1989, the CBJ has initiated a number of reforms to make the banking system more secure and competitive: local Jordanian banks paid-up capital increased to US\$ 28.25 million, foreign banks paid-up capital increased to USD 14.12 million, 80% of required reserves must be held at the CBJ, no restrictions on the inter-bank foreign exchange market, restrictions on the flow of trade in foreign currency were removed during 1997, and the main restrictions on foreign capital were removed during 1997 (Zeitun,

2009). More reforms were undertaken to enhance the sector such as the new banking law, new securities law, new auditing profession law, among others during the period 1999–2002 (Khamis, 2003). For example, In 1999, the government sold its equity in a large number of banks (The Housing Bank, Cairo Amman Bank, Export & Finance Bank) (Zeitun 2009). by the mid-1980, Jordan was the only Arab country in which the value of banks' assets exceeded its GDP. In the past decade, the numbers posted by the sector were no less than impressive; total commercial bank assets rose from JD12.9 billion in 2000 to JD30.1 billion until the end of August 2008 while total deposits increased from about JD8.2 billion to JD16.0 billion during the same period.

2. Economic Growth in Jordan

The Gross Domestic Product (GDP) in Jordan expanded 2.60 percent in the third quarter of 2012 over the same quarter of the previous year. GDP Annual Growth Rate in Jordan is reported by the Central Bank of Jordan. Historically, from 1993 until 2012, Jordan GDP Annual Growth Rate averaged 5.07 Percent reaching an all time high of 10.58 Percent in March of 2007 and a record low of -1.11 Percent in March of 1996. The Jordanian economy is dominated by tourism, financial services, transportation, manufacturing and remittances from Jordanians working abroad. Jordan's lack of arable land and insufficient supplies of water means that agriculture is mostly a non-relevant sector and that the country invests heavily in water recycling. Jordan's economy is highly influenced by the state, however, recently, the efforts have been undertaken to reduce barriers to do business.

3. Literature Review

Levine (1997) provides an extensive and in-depth review of the literature regarding the relationship between economic growth and financial development. In his review, Levine concludes that a growing body of empirical work, employing a wide range of time-series and cross-country data, reveals a strong positive link between financial sector development and long-run economic growth. Consistent with this conclusion, Levine and Zervos (1998) find that after controlling for economic and political factors, that banking development and stock market growth positively impact future economic growth, capital formation, and enhanced productivity. They conclude that stock markets and banks appear to have a separate and distinct important role to play.

In a recent review of the empirical literature, Fink, Haiss and Vukšić (2006) present some evidence that total financial intermediation contributed to growth in nine EU accession countries for the period 1996–2000, with domestic credit representing a significant factor in promoting growth, and private credit and stock market capitalization. Mehl, Vespro et al. (2006) found that financial deepening had no significant effects on the growth of the South-Eastern European countries for the period 1993–2003. Moreover, they even ascertain a significant negative effect of financial intermediation on growth and a positive and sometimes significant effect of foreign bank penetration ratio. Additionally, in most specifications higher creditor right protection exerted a positive impact on growth.

Furqani and Mulyany (2009) uses the cointegration test and

vector error correction model to examine the dynamic interaction between Islamic banking and economic growth in Malaysia. Using total Islamic bank financing as proxy to financial development and real GDP per capita, fixed investment and trade activities to represent the economic growth and activity, they found that there is evidence of the presence of demand-following hypothesis, in which increase in GDP induces Islamic banks and not vice versa.

Fadare (2010) empirically identifies the effect of banking sector reforms on economic growth in Nigeria by using the data 1999 – 2009. Variables used for the study are interest rate margins, parallel market premiums, total banking sector credit to the private sector, inflation rate, inflation rate lagged by one year, size of banking sector capital and cash reserve ratios. Results indicate that the relationship between economic growth and other exogenous variables of interest rate margins, parallel market premiums, total banking sector credit to the private sector, inflation rate and cash reserve ratio show the negative and insignificant. Hence it is suggested that criteria which encourage banking sectors to give more capital or start huge amount of lending to the individuals by minimize cash reserve ratios which is not suppose to be motivated factors for economic growth if the borrowing capacity that due to these criteria it will not surpass to the growth of private sector in the form of longer term finances. To find out the solution of this problem, the financial policies should consider to reform and enforce the borrowing in small industries with proper regulatory policies and against secure type of collaterals and confirmation of guaranteed repayment of finances given to them.

Cojocaru, Hoffman and Miller (2012) examine the role of financial development in economic growth in the former Communist countries of Central and Eastern Europe and the Commonwealth of Independent States during the first two decades since the beginning of transition. These countries, which had undeveloped financial systems under Communism, provide an interesting test of the relationship between financial development and growth. They show that credit to the private sector had a positive effect on growth in these countries; however, high levels of inflation can render the positive effect of private credit insignificant. High interest rate spreads and reduced banking competition hampered economic growth. However for the case of Indonesia Abduh and Omar (2012) find that Islamic financial development significantly and positively affecting economic growth in the long run and so does economic growth upon Islamic financial development which is obviously suggesting a bi-directional relationship.

4. Study hypotheses

This research is based on the following hypotheses that clearly define the research criterion.

H1. There is a significant impact of financial development on the economic growth in the short run

H1.1: Deposit has a significant impact on Economic Growth in the short run.

H1.2: Investments have a significant impact on Economic Growth in the short run.

H1.3: Financing has a significant impact on Economic Growth in the short run.

H2: There is a significant impact of financial development on the economic growth in the long run

H2.1: Deposit has a significant impact on Economic Growth in the long run.

H2.2: Investments have a significant impact on Economic Growth in the long run.

H2.3: Financing has a significant impact on Economic Growth in the long run.

4. Methodology

The research methodology is explained as follows:

4.1 Data and Variables Description

This study investigates the contributions of banking sector in economic growth of Jordan. The study used annual time series data for the Jordanian banks covering the period from 1993 to 2015, which is obtained from Amman stock exchange and banks' web sites. The following tests: Augmented Dickey Fuller (ADF) and Philip Perron unit root test, granger causality test, Cointegration test and the Vector Error Model (VECM) are used to see whether the financial system influences economic growth and growth transforms the operation into the financial system in the long run. To examine the dynamic relation between the study variables the cointegration vector-error-correction model (VECM) is used; these statistical techniques are used to establish long-run relationships between variables and an equilibrium relationship

is said to exist when the variables in the model are cointegrated. In order to conduct the cointegration test base on VECM the following steps are followed;

The first step is the unit root and stationarity test which is necessary in identifying the stationarity status of the variables in order to ascertain their order of integration before cointegration test can be conducted; the variables that are integrated of the same order may be cointegrated. Hence the augmented Dickey–Fuller (ADF) and the Phillips and Perron (PP) tests are performed. These tests are conducted on the variables in level and first differences. The second step involves the determination of lag lengths to be included in the cointegration test and subsequent VECM. The choice of lag length is determined by using the Akaike information criterion (AIC) and Schwartz Bayesian criterion (SBC). The next step is the cointegration test and in this study the Johansen procedure due to Johansen (1991) is used. Some of the advantages of the Johansen’s procedure are that it permits the testing of cointegration as a system of equations in one step; do not carry over an error from one step into the rest and it does not require the prior assumption of endogeneity or exogeneity of the variables.

The VECM provides a means whereby a proportion of the disequilibrium in the short run is corrected in the long run; thus, error correction mechanism is a means to reconcile the short-run and long-run behaviors of the variables (Gujarati and Porter, 2010). The size of the error correction term indicates the speed of adjustment of any disequilibrium towards a long-run equilibrium state. In addition to this, the VECM also enables the determination of the short and long run Granger causalities between the cointe-

grated variables; the channels of causality are the coefficients of lagged first–differenced variables and that of the error correction term for short and long run causalities respectively.

The GDP growth model is based on a causality that runs from financial sector development to economic growth. This model is based upon the neoclassical one–sector production where financial sector development is an input, along with other variables, and is represented by the following equation:

$$GDPT = \alpha_0 + \beta_1 FIN_t + \beta_2 INV_t + \beta_3 DEP_t + e \dots\dots\dots (1)$$

Where, Y represents the economic growth, FIN is a measure of the level of financing provides by the banking sector, INV represents the total investments however, the DEP is the total deposits of banks and finally e is a vector of other factors, and t represents an annual time series.

GDP is used as proxy for the economic growth, whereas, the (FIN) indicator is the total financing which represents the private credit and the Islamic financing, where private credit is the credit extended to the private sector by commercial banks. And the Islamic financing is the projects that are financed by Islamic banks through the Islamic modes of finance. This variable indicates the importance of the role played by the financial sector, especially the deposit money banks, in the financing of the economy (Levine, 2003); it also measures the activity of financial intermediaries in one of their primary function of channeling savings to investors. The third variable in this paper is the deposits (DEP) which are the sum of demand deposit, savings and time deposits; it provides an alternative to the broad money ratio especially when dealing with

developing countries. This is because in developing countries, a large component of the broad money stock is currency held outside the banking sector. Therefore, a rising ratio of broad money to GDP may reflect the more extensive use of currency than an increase in the volume of bank deposits (Aziakpono, 2003).

The last variable is the total investments (INV) which represents the size of the banking system and this later is measured by the natural logarithm of the total assets of the banking sector. It's interesting to notice that the researcher takes the natural logarithm of all the variables in order to avoid the problem of the huge numbers. And all the independent variables are expressed as ratios of GDP. These indicators are commonly referred to and used in the literature (e.g. Aziakpono, 2003; Furqani and Mulyany, 2009) this informed the choice of these measures in this study. Whereas, total financing, total deposits and investments are used to measure the banking development.

Stationarity Test (Unit Root Test)

The unit root test examines the stationarity of the data, the data series are stationary if its mean and variance are constant over time and the value of the covariance between the two time periods depends only on the distance or lags between the two time periods (Gujarati and porter, 2010). To single time series the early work that used the unit root is backed to (Dickey and Fuller, 1979). The null hypothesis for the unit root test is that we have a unit root. We reject the null hypothesis when the t-statistic is more negative than the critical value. If we reject the null hypothesis, we have a stationary time series. If we cannot reject the null hypothesis, we have a unit root. Unit Roots tests were conducted by utilizing

the Augmented Dickey–Fuller (ADF) and the Phillips and Perron (PP) tests. The time series GDP, INV, DEP AND FIN were tested whether they are integrated of order one. The underlying models include a constant and the constant and trend. The essence of the Augmented Dickey–Fuller (ADF) test is the null hypothesis of non–stationarity the rejection of which requires a negative and significant test statistic.

The Granger Causality Test

The third step is the Granger causality test to determine the causal relationship between the variables. A Granger–causality test examines whether the variable to be tested adds explanatory power to an existing relationship between one (or more) other variable(s) and its (their) lags. For example, if Z_t is a dependent variable and Z_{t-1} is the variable lagged one period, then $Z_t = f(Z_{t-1}, v_t)$ would represent a statistical relation between the two, when v_t is some unknown source of variation in the functional relation between them. For the Granger test, a known variable would be put into the functional relation of Z_t and Z_{t-1} with various lags and leads to determine whether it helped to reduce v_t (for more details see Gujarati, 2004).

Cointegration Test

If it is determined that the time series is nonstationary, it is necessary to test for cointegration. As Engle and Granger (1987) point out, it is possible that a linear combination of nonstationary series will be stationary. If such a stationary combination does exist, the non–stationary time series are said to be cointegrated. Then it is possible to interpret it as a long–run equilibrium rela–

tionship among the variables. I use the method developed by Johansen (1991) to perform cointegration tests.

5. Results and Discussion

The aim of the empirical section of the paper is to investigate the long run and dynamic relationship between banking development and economic growth in Jordan and the following tests and analyzes have been used to reach the study objectives:

5.1. Stationarity Test

Each time series was examined to determine if it is stationary or non-stationary employing the unit roots test. If a time series is found to be non-stationary, subsequently the examination was undertaken to determine if its first difference is stationary. Using this procedure the order of integration of a time series is determined. The augmented Dicky-Fuller (ADF) and the Phillips and Perron (PP) tests for unit root and stationarity on all the variables at levels and first difference is presented in Table 1. The Table shows that all the variables have a unit root; implying they are not stationary at their levels. However, the tests showed that the first difference of the variables has no unit root and the null hypothesis was rejected at 5% level of significance, indicating that all the variables are integrated of the same order, that is I(1), that allows for applying the VECM methodology.

Table (1) Unit Root Test Results

Variables	ADF		PP	
	Level	1st Difference	Level	1st Difference
GDP	-1.348527	-9.156208	-0.110068	-9.156208
	(0.5847) ***	(0.0000) ***	(0.9356)***	(0.0000) ***

FIN	-0.834855 (0.7870)	-4.575727 (0.0021) ***	-0.834855 (0.7870)	-4.575727 (0.0021) ***
INV	-1.321744 (0.5972)	-9.001450 (0.0000) ***	-1.321744 (0.5972)	-9.001450 (0.0000) ***
DEP	-2.043154 (0.2676)	-8.612790 (0.0000) ***	-4.690428 (0.0015)	-8.612790 (0.0000) ***

Probabilities of rejection of null hypotheses are presented in parenthesis. ***, ** and * denotes significance at $p < 1\%$, 5% and 10% respectively. Economically speaking, two variables will be cointegrated if they have a long-term, or equilibrium, relationship between them (Gujarati, 2004).

5.2. The Optimal Lag Length Selection

The next step is to formulate and estimate the appropriate VECM model. The variables in the VECM models are used on their stationary level. The initial task in estimating the VECM model is to determine the optimum order of lag length. This is important since under parametrization would tend to bias the results and over-parametrization would diminish the power of tests. The optimal lag length of the lagged differences of the tested variable is determined by minimizing the Akaike Information Criteria (AIC) and Schwarz Bastian Criteria (SBIC). Table (2) shows the selected lag length by criteria, all the criteria (LR, FPF, AIC, SC and HQ) recommended a joint lag 2.

Table (2) The Optimal Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-125.6586	NA	2,710743	12,34844	12,54740	12,39162
1	-93.50705	48,99292	0,604083	10,81019	11,80498	11,02609
2	-66.55645	30,80069*	0,259854*	9,767280*	11,55789*	10,15589*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan–Quinn information criterion

5.3. The Granger Causality Test

The Granger-causality tests and the VECM simulations reported in this article are consistent in using only one lagged value of the relevant variables. The tests are restricted to two lagged values because the short span of the available annual data necessitates economizing on degrees of freedom—the shortage of degrees of freedom being especially acute for the VECM analysis and this is consistent with precedent lag length selection test. The test results are presented in Table (3). Obviously, both the financing (FIN) and total investments in Jordanian banks have statistical significant effects on the economic growth (both are accepted at 5% significant level) for the Jordanian economy in the short term. It is interesting that there isn’t any granger causality between the total deposits (DEP) and economic growth which means that is rejected at 5% significant level. Moreover, from the same table it can be seen that the economic growth doesn’t have any significant impact on the financing the total deposits and the total investments in Jordanian banks

Table (3): Granger Causality Results

:Null Hypotheses	F-Statistic	Probability
DEP does not Granger Cause GDP	0,57699	0,5728
GDP does not Granger Cause DEP	0,01491	0,9852
FIN does not Granger Cause GDP	4,10856	***0,0488
GDP does not Granger Cause FIN	0,92899	0,4152
INV does not Granger Cause GDP	4,28906	***0,0323
GDP does not Granger Cause INV	0,39670	0,6790

*** denotes significance at $p < 10\%$.

5.4. Johansen Cointegration Test

The Cointegration relationship among the GDP, INV, FIN, and DEP has been investigated using the Johansen technique and the results of the Cointegration test are presented in table (4)

below and reveal that both trace statistic (λ_{trace}) and maximum eigenvalue statistics indicate that there is at least one Cointegration vector among GDP, DEP, INV and FIN. Since, the statistical value of both Trace and Max–Eigen tests are less than the critical value at a significant level of 5%. As a result the null hypothesis of no Cointegration vector is rejected in favor of one integrating vector under both tests statistics at 5 percent level of significance. These findings allow us to proceed with the next step which is to estimate the long run VECM relationship between the study variables.

Table (4) Johansen Cointegration Tests

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0,05 Critical Value	Prob.**	Max– Eigen Statistic	0,05 Critical Value	Prob.**
None *	0,8227	53,97357	47,8561	0,0119	32,87815	27,58434	0.0095
At most 1	0,4656	21,09542	29,7970	0,3517	11,90820	21,13162	0.5568
At most 2	0,3300	9,187217	15,4947	0,3484	7,610953	14,26460	0.4196
At most 3	0.0796	1,576264	3,84146	0,209	1,576264	3,841466	0.2093

Trace test and Max–eigenvalue test indicate 1 cointegrating eqn (s) at the 0.05 level

* denote rejection of the hypothesis at the 0.05 level

Vector error correction model (VECM) Estimates

The lag order of 2 is selected by minimized AIC statistics for our dynamic VECM specification. The estimated VECM is reported in table (5) below. In general, the explanatory power of all the equations of the VECM model as reflected in their r^2 and F statistic is fairly well. Moreover, the results show that all the variables investments (INV), deposits (DEP) and financing (FIN) are signi–

ficant at 5 per cent with expected sign a 1% rise in investments in the Jordanian banking sector, and in the financing provided by these banks lead to an increase in the Jordanian economic growth by 0.222742 and 1.000125 respectively during the study period. This means that the following hypotheses are accepted).

However, the deposits variable shows an insignificant impact on the economic growth at 5 percent significance level and this mean that the hypothesis is rejected. It is obvious that a considerable contribution to growth shows that banks in Jordan seem to have played a big role in accelerating the economic growth process. This high response of GDP growth to such indicators indicates the importance of the capital base of Jordanian banks in boosting the overall economic growth and in providing an appropriate investment climate through the different modes of financing provided by different types of banks. Finally, the magnitude of the error correction model term provides the evidence of a long-run linkage between GDP growth and financial sector indicators.

Table (5) the Vector Error Correction Model Estimation

D(NGDP)				
Error Correction:	Coefficient	Std. Error	t-Statistic	Prob.
D(NGDP(1-))	0,040692	(0,19075)	[0,21333]	0,8323
D(NGDP(2-))	0,002826	(0,17789)	[0,01588]	0,9874
D(NDEP(1-))	0,185790	(0,08679)	[2,14063]	0,0391
D(NDEP(2-))	0,094234	(0,06927)	[1,36037]	0,1822
D(NFIN(1-))	1,000125	(0,33979)	[2,94337]	0,0057
D(NFIN(2-))	0,872715	0,252769	3,452615	0,0014
D(NINV(1-))	0,413779	(0,13258)	[3,12105]	0,0035
D(NINV(2-))	0,222742	(0,09832)	[2,26544]	0,0296
C	0,097702	(0,08962)	[1,09018]	0,2829

R-squared
Adj.
R-squared
F-statistic

Conclusion

The relationship between economic development and long-run economic growth has been studied since the nineteenth century, although not always with economists agreeing on the matter. On the other hand, understanding the policy implications of the nexus between financial development, and economic growth is critical in development economics. Much still needs to be understood about the various integrations among these two factors in order for policy-makers to make the right decisions about development policy. This paper investigates the long run relationship between financial development for banking sector and economic growth in Jordan. Through, the application of the Johansen Cointegration technique and the vector error correction methodology (VECM) for the period 1993 to 2015, the results of the Cointegration technique found that there is long run relationship between the dependent and the independent variables.

The results of the ADF and PP unit root tests demonstrate that all the series are non-stationary at their levels but stationary at their first difference they are integrated for order one I(1). Furthermore, the study tests the causality between the used variables by applying the granger causality test to test for the short run relationship between the dependent and the independent variables and the results reveal that both the financing (FIN) and total investments in Jordanian banks have statistical significant effects

on the economic growth for the Jordanian economy in the short term. However, there isn't any granger causality between the total deposits (DEP) and economic growth. Moreover, the economic growth doesn't have any significant impact on the financing the total deposits and the total investments in Jordanian banks. Then the researcher moves forward by applying the Johansen multi-variate Cointegration test in order to investigate the long run relationship among the economic growth represented by GDP the total financing, total deposits and total investments in Jordanian banks. The results indicate the existence of one Cointegration vector among these variables.

To test the long run relationship among the study variables the VECM has been used and the results reveal that all the variables investments (INV), deposits (DEP) and financing (FIN) are significant at 5 per cent with expected sign a 1% rise in investments in the Jordanian banking sector, and in the financing provided by these banks lead to an increase in the Jordanian economic growth during the study period. However, the deposits variable shows an insignificant impact on the economic growth it is obvious that a considerable contribution to growth shows that banks in Jordan seem to have played a big role in accelerating the economic growth process. This high response of GDP growth to such indicators indicates the importance of the capital base of Jordanian banks in boosting the overall economic growth and in providing an appropriate investment climate through the different modes of financing provided by different types of banks. Finally, the magnitude of the error correction model term provides the evidence of a long-run linkage between GDP growth and financial sector

indicators. Finally, from the above discussion it can be concluded that both financing and investments in Jordanian banks have a statistical significant on the economic growth. However, the deposits show an insignificant impact on the economic growth in both short and long run.

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