

The Relationship between Banking Sector Development and Economic Growth in Egypt

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Abstract

The present research examines the relationship between banking sector development and economic growth in Egypt. This is conducted by using a time-series data over the period 1974-2015. To estimate the relationship between banking sector development and economic growth, a multiple regression model is employed. The results of the study reveals that the banking sector development has a positive and significant impact on economic growth in Egypt.

يقوم البحث باختبار العلاقة بين تنمية القطاع المصرفي والنمو الاقتصادي في مصر. تم القيام بذلك باستخدام بيانات سلاسل زمنية سنوية خلال الفترة من 1974-2015. ولاختبار العلاقة بين تنمية القطاع المصرفي و النمو الاقتصادي في مصر، تم استخدام نموذج انحدار متعدد. وتتلخص نتائج الدراسة في انه وجد ان تنمية القطاع المصرفي له اثر ايجابي ومعنوي علي النمو الاقتصادي في مصر.

Key Words: Banking Sector Development, Economic Growth, Causality.

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1. Introduction

The banking sector plays an essential role in the economy as the main source of finance for investments. Thus, the development of the banking sector is crucial for enhancing the economic growth. Where any development in the banking sector affects all the sectors of the economy and improves the allocation of resources.

Most studies have concentrated on measuring the impact of financial depth as an indicator of the banking sector development on economic growth. However, the present research is focusing on measuring the relationship between banking sector development and economic growth by including other indicators beside the financial depth which are the access, efficiency, and stability of the banking sector.

The rest of the research is organized as follows: Section two presents the statement of the problem. Section three highlights the hypothesis of the research. Section four shows the objectives of the research. Section five provides a literature review on the relationship between banking sector development and economic growth. Section Six shows the description of the model. Section seven provides the sources of the data used in the analysis. Section eight presents the empirical results of the study. And finally section nine presents a summary and a conclusion for the research.

2. Statement of the Problem

The Egyptian banking sector has witnessed different policies and reform plans over the past few decades. These reforms have contributed to the development of the banking sector. Thus, the problem of the research can be expressed in the following question:

“Has the banking sector development that resulted from the different reform plans affected the economic growth in Egypt or not, and to what extent?”

3. Hypothesis of the Research

The research is based on the hypothesis that “There is a positive relationship between the banking sector development and economic growth in Egypt.”

4. Objective of the Research

The research aims at estimating the impact of banking sector development on economic growth in Egypt by using the banking sector development indicators that were provided by the World Bank and the Global Financial Development Database (GFDD) which are the financial depth, access, efficiency, and stability of the banking sector.

5. Literature Review on the Relationship between Banking Sector Development and Economic Growth

The origins of the banking-growth nexus discussions is dated back to Walter Bagehot (1873), who was the first to show the role of banks in the real economy. Bagehot’s work has appeared

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in Great Britain which had one of the most advanced banking systems at that time. Bagehot (1873: 11) has pointed out that what allows the banking institutions to hold the deposits of individuals is the confidence and trust that individuals have in these banking institutions.

Joseph Schumpeter (1911) gave much attention for the role that savings and the banking system play in the accumulation of capital and the growth process. King and Levine (1993: 1) have pointed out that Schumpeter has emphasized the essential role of banks in the growth process, where banks provide services that are essential for technological innovation and economic development. Moreover, Arestis (2005: 2) has noted that Keynes has considered that the credit provided by banks is essential for enhancing the production process. Thus, bankers have to provide the required facilities and credit that enables the productive resources of the economy to be employed at their full capacity.

Arestis (2005: 6) has noted that McKinnon and Shaw have introduced the “financial liberalization” hypothesis which entailed that financial markets have to be liberalized and all restrictions on the banking sector have to be removed. They have viewed that governments have to liberalize financial markets by removing interest rate ceilings, reducing reserve requirements, and cancelling direct credit programs in order to allow credit allocation to be determined by the free market.

Some empirical studies such as Acaravci et al. (2009) have investigated the causal relationship between financial sector development and economic growth by using a panel data on 24 sub-Saharan African countries over the period 1975-2005 and they have found that there is a causal relationship between the growth of real GDP per capita and the domestic credit provided by the banking sector. In addition, Peia and Roszbach (2013) have examined the casual relationship of the finance-growth nexus by conducting a country-by-country time-series analysis of 26 developed and emerging countries over the period 1973-2011; they have found that the relationship between the banking sector development and economic growth is bi-directional.

It can be concluded that the studies that have attempted to identify the main motives of economic growth have asserted that the banking sector development is one of the main factors that generates economic growth. This is due the essential role that the banking sector plays in the economy through providing the required finance for investment projects and innovative activities that contribute positively to the growth process.

6. Description of the Model

The research investigates the relationship between banking sector development and economic growth in Egypt by conducting a multiple regression analysis for an annual time-series data by using the OLS method. According to king and Levine (1993), the model is based on the neoclassical production function which takes the following form:

$$Y_t = AK_t^\alpha L_t^\beta F_t^\theta \quad (1)$$

Where:

Y_t = the real output.

A = technology and it is exogenous.

K_t = the physical capital in year t .

L_t = the labor force in year t .

F_t = the banking sector development in year t .

Since the neoclassical production function is non-linear, the model is constructed in a log-log form in which the real GDP is the dependent variable. The explanatory variables are composed of two sets, the first set includes the banking sector development indicators, while the second set is composed of the other variables of the production function which are the real gross capital formation and the labor force.

$$\log Y_t = \beta_0 + \beta_1 \log M2/GDP + \beta_2 \log PC_t/GDP_t + \beta_3 \log BNKDEN_t + \beta_4 \log DATM + \beta_5 \log IRS_t + \beta_6 \log LTD_t + \beta_7 \log K_t + \beta_8 \log L_t + \varepsilon_t \quad (2)$$

Where:

Y_t = real GDP in year t (2010 = 100).

$M2/GDP$ = the ratio of domestic liquidity in year t .

PC/GDP_t = the ratio of domestic credit provided by the banking sector to the private sector in year t to GDP in year t .

$BNKDEN_t$ = the banking density in year t.

$DATM_t$ = a dummy variable for ATMs in the Egyptian banking sector in year t.

IRS_t = interest rate spread of the Egyptian banking sector in year t.

LTD_t = loan to deposit ratio of the Egyptian banking sector in year t.

K_t = real gross capital formation in year t.

L_t = the labor force in year t.

ε_t = the error term in year t.

The monetization ratio which is the ratio of M2/GDP is used in the present study in order to capture the size of the banking sector, where an increase in this ratio indicates an expansion in the financial intermediaries relative to the real economy. According to the economic theory, the ratio of M2 to GDP is expected to have a positive impact on economic growth ($\beta_1 > 0$), where the larger the size of the financial sector, the more its contribution to the growth process by mobilizing and channeling savings to productive investments which stimulate economic growth.

The ratio of private credit to GDP (PC/GDP_t) is included in the analysis to capture the financial intermediation in the economy, where the higher the ratio of the private credit to GDP, the more the investments that are undertaken in the economy. Thus, the relationship between the ratio of private credit to GDP and economic growth is expected to be positive ($\beta_2 > 0$).

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The banking sector access is measured by the banking density ($BKDN_t$) and the ATMs density ($DATM_t$) as suggested by the FSDI. The increase in the banking density enhances the access for the banking sector, which in turn is expected to have a positive impact on economic growth ($\beta_3 > 0$). The ATM density is indicated by a dummy variable in which 0 is for the years before the expansion of the ATMs in Egypt and 1 is for the years after the expansion of the ATMs in Egypt. The impact of the ATMs on the banking sector access and hence on economic growth is expected to be positive ($\beta_4 > 0$).

The efficiency of the banking sector indicator is measured by the interest rate spread (IRS_t). It represents the transaction costs in the banking sector, where the lower the interest rate spread the higher the efficiency of the banking sector because it indicates a lower transaction costs. Thus, the relationship between interest rate spread and economic growth is expected to be negative ($\beta_5 < 0$).

According to the banking sector stability indicator, it is measured by the loan to deposit ratio which was suggested by the GFDD as an indicator for the banking sector stability. As the loan to deposit ratio increase, the banking sector stability deteriorates. Thus, the relationship between banking sector stability and economic growth is expected to be negative ($\beta_6 < 0$).

Based on the work of King and Levine (1993) in estimating the production function, the present study measures economic growth by using the real GDP. In addition, physical capital and the size of the labor force are used as explanatory variables that affect economic growth, where physical capital is measured by the real gross capital formation (GKF_t) and its effect on economic growth is expected to be positive ($\beta_7 > 0$), and the labor force (L_t) is expected to have a positive impact on economic growth ($\beta_8 > 0$).

7. Data Sources

The data are obtained from different sources. The real GDP, the ratio of private credit to GDP, the interest rate spread, and the loan to deposit ratio are obtained from the World Bank database. The banking density variable is collected from the Central Bank of Egypt annual reports. The labor force variable is collected from the labor statistics and surveys report published by CAPMAS.

8. Empirical Results

8.1 Unit Root Test

The unit root test is used for testing the stationarity of data, where it is essential to ensure the time-series is stationary in order to avoid any spurious regression and to ensure that the data are reliable and can be used in the regression analysis.

The present study conducts the unit root test by testing the null hypothesis which indicates that the variable has a unit root in which the time series of the considered variable is $I(1)$. The

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present study conducts the unit root test by using Augmented Dickey-Fuller (ADF).

Table (1): ADF Unit Root Test Results

| Variable | In Level (Intercept) | In Level (Trend and intercept) |
|---------------|----------------------|--------------------------------|
| Log(real GDP) | -4.766* | -4.477* |
| Log(M2/GDP) | -3.934* | -1.185 |
| Log(PC/GDP) | -4.054* | -1.185 |
| Log(BNKDEN) | -6.321* | -6.999* |
| Log(IRS) | -3.812* | -3.786** |
| Log(LTD) | -2.946** | -3.003 |
| Log(K) | -3.220** | -2.719 |
| Log(L) | -0.985 | -4.095** |

Source: Researcher.

*Indicates Significance at 1% Level.

** Indicates Significance at 5% Level.

*** Indicates Significance at 10% Level.

The results shown in table (1) reveal that according to the Augmented-Dickey Fuller (ADF) test, the null hypothesis which indicates that the time series has no unit root and hence it is integrated of order one I(1) is rejected for all the variables in level with intercept at 5% significance level, except for the labor force, where the null hypothesis is rejected in level with trend and intercept at 5% significance level. Thus, the alternative hypothesis which indicates that the time series is

integrated of order zero $I(0)$ is accepted for all the variables in level which means that all the variables are stationary in level.

8.2 Regression Estimation Results

The study measures the banking sector development by using some variables of the banking sector development indicators that were introduced by the World Bank's FSDI project in 2006 and the GFDD for the indicators of the financial depth, access, efficiency, and stability.

The present study applies a regression analysis on the Egyptian banking sector to show the impact of the banking sector development on economic growth in Egypt since the adoption of the open-door in 1974 which involved the entrance of foreign banks, followed by the liberalization of the financial sector in 1991 which allowed the banking sector to attain its full liberalization, till the latest banking reform plan that was undertaken by the CBE in 2004 in order to restructure the banking sector and extended till the first quarter of 2012. Thus, the study is conducted over the period 1974 – 2015 to show the impact of the development plans that were undertaken in the Egyptian banking sector on economic growth.

Dependent Variable: Real Gross Domestic Product [Log (GDP)]

Table (2): The Estimation Results for the Egyptian Banking Sector (1974-2015)

| Variable | Coefficient | t-Statistic | Prob. |
|--------------------|-------------|-------------|--------|
| C | -4.955 | -1.461 | 0.0153 |
| Log(M2/GDP) | -0.890 | -3.322 | 0.0022 |
| Log(PC/GDP) | 0.722 | 3.753 | 0.0007 |
| Log(BNKDEN) | 0.188 | 3.153 | 0.0034 |
| DATM | 0.310 | 4.572 | 0.0001 |
| Log(IRS) | -0.288 | -2.846 | 0.0075 |
| Log(LTD) | -0.813 | -3.409 | 0.0017 |
| Log(K) | 0.441 | 3.904 | 0.0004 |
| Log(L) | 0.698 | 4.301 | 0.0001 |
| R- Squared | 0.973 | | |
| Adjusted R-Squared | 0.967 | | |
| Durbin-Watson stat | 2.152 | | |
| F-statistic | 154.165 | | |
| Prob(F-statistic) | 0.0000 | | |

Source: Researcher.

Estimation results shown in table (2) indicates that according to the Adjusted R-squared the change in the explanatory variables explains 96.7% of the variation in the real GDP in Egypt. In addition, Durbin-Watson statistic is 2.152 which indicates that there is no autocorrelation

The estimates of the explanatory variables indicate that the ratio of M2/GDP has a negative and statistically significant impact on real GDP, in which a 1% increase in the ratio of M2/GDP results in 0.89% decrease in the real GDP.

Despite this result is inconsistent with the economic theory, it is consistent with the results of Al-Malkawi et al. (2012) who have found that the relationship between financial development measured by the ratio of M2 to GDP and economic growth in the United Arab of Emirates is negative and statistically significant. They have attributed this result to the degree of development of the financial sector in the UAE because it is still in the transitional phase and it requires more developments that could enable it to promote economic growth.

For the present study, this negative relationship between the ratio of M2/GDP and economic growth in Egypt can be attributed to the financial repression measures that were adopted in the 1960s until the beginning of the 1990s, in addition to the domination of the public sector banks which were experiencing poor performance for long periods of time.

The ratio of private credit to GDP has positive and statistically significant impact on real GDP per capita, which implies that the financial depth has positive impact on economic growth in which a 1% increase in the financial depth measured by the ratio of private credit to GDP results in 0.72 % increase in the real GDP.

The banking sector density and the dummy of ATM variables have positive and statistically significant impact on real GDP. This indicates that the banking sector access has positive impact on economic growth in which a 1% increase in banking sector

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access measured by the banking density leads to 0.18% increase in the real GDP. In the meantime, a 1% increase in the banking sector access measured by the ATM density leads to 0.31% increase in the real GDP.

For the banking sector efficiency, the results indicate that the interest rate spread has negative and statistically significant impact on real GDP, where a 1% increase in interest rate spread results in 0.28% decrease in real GDP. This result is in accordance with Mujeri and Younus (2009) who have argued that high interest rate spread indicates higher transaction costs which affects negatively the efficiency of the banking sector and hence it affects negatively economic growth.

The estimation of the banking sector stability reveals that the loan to deposit ratio has a negative and statistically significant effect on real GDP in which a 1% increase in the loan to deposit ratio leads to 0.81% decrease in the real GDP. This result can be justified on the basis that a high increase in the loan to deposit ratio will negatively affect the liquidity in the banking sector which in turn will reduce the banking sector stability and increase the risk of banking insolvency. Consequently, the reduction in the banking sector stability will affect negatively economic growth.

According to the estimation results of the impact of the physical and human capital on economic growth, it was revealed that both the labor force and the real gross capital formation has positive and statistically significant impact on real GDP.

8.3 Causality Test

Granger causality test was developed by Granger (1969). This test was introduced in order to determine the causality between two variable (for instance: x and y), if x is used for forecasting y by making the forecasting of y more accurate by taking into consideration the past values of y, thus, x is granger causes y. Granger causality can be determined by the following four cases (Foresti, 2006: 4):

- 1- Unidirectional Granger causality from x to y: If x is Granger causes y, but y does not Granger causes x.
- 2- Unidirectional Granger causality from y to x: if y is Granger causes x, but x does not Granger causes y.
- 3- Bidirectional causality: if x and y Granger causes each other.
- 4- Independence between x and y: if x and y does not Granger causes each other.

The present study conducts a Granger causality test in order to show whether there is a casual relationship between banking sector development and economic growth in Egypt or not.

The study tests the following two null hypotheses:

H₁: banking sector development (F) does not Granger Cause economic growth (Y). If this null hypothesis is rejected, this indicates that banking development causes growth.

H₂: economic growth (Y) does not Granger Cause banking sector development (F). If this null hypothesis is rejected, this means that economic growth causes banking development.

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The estimated results of the Granger Causality test are shown in table (3) as follows:

Table (3): Granger Causality Test for Banking Sector Development and Economic Growth in Egypt

| Direction of Causality | Obs. | F-Statistic | Prob. | Results of Causality |
|--|------|--------------------|------------------|--|
| From log(M2/GDP) to log(GDP) From log(GDP) to log(M2/GDP) | 40 | 0.82526 0.17588 | 0.4465 0.8395 | Independence |
| From log(PC/GDP) to log(GDP)** From log(GDP) to log(PC/GDP) | 40 | 2.99182 0.35751 | 0.0632 0.7019 | Unidirectional from log(PC/GDP) to log(GDP) |
| From log(BNKDEN) to Log(GDP) From log(GDP) to log(BNKDEN)*** | 40 | 0.35640 2.23874 | 0.7027 0.1216 | Unidirectional from log(GDP) to log(BNKDEN) |
| From DATM to log(GDP)** From log(GDP) to log DATM*** | 40 | 2.68660 2.21798 | 0.0821 0.1239 | Bidirectional |
| From log(IRS) to log(GDP) From log(GDP) to log(IRS)** | 40 | 0.14183 3.09482 | 0.8629 0.0579 | Unidirectional from log(IRS) to log(GDP) |
| From log(LTD) to log(GDP)*** From log(GDP) to log(LTD) | 40 | 2.22539 0.24999 | 0.1231 0.7802 | Unidirectional from log(LTD) to log(GDP) |

| | | | | |
|----------------------------|----|---------|--------|--|
| From log(GKF) to log(GDP)* | | 4.70223 | 0.0155 | Bidirectional |
| From log(GDP) to log(GKF)* | 40 | 3.19342 | 0.0532 | |
| From log(L) to log(GDP) | | 0.01392 | 0.9862 | Unidirectional from log(L) to log(GDP) |
| From log(GDP) to log(L)* | 40 | 6.51485 | 0.0039 | |

Source: Researcher.

*Indicates Significance at 1% Level.

** Indicates Significance at 5% Level.

*** Indicates Significance at 10% Level.

The results in table (3) shows that for the financial depth which is measured by the ratio of PC/GDP, the null hypothesis is rejected at 5% significance level which indicates that the causality runs from financial depth to economic growth. Regarding the relationship between the ratio of M2/GDP and economic growth, there is no causal relationship between the two variables.

The results of the causality between financial depth and economic growth are consistent with Demetriades and Hussein (1996) who have conducted Causality test on the relationship between financial development and growth for 16 countries, where they have found that the ratio of M2/GDP does not cause economic growth for Costa Rica, El Salvador, Greece, Guatemala, Pakistan, Portugal, South Africa, Sri Lanka, and Turkey. This results provide an evidence that in most developing countries the ratio of M2/GDP does not provide accurate prediction for economic growth. For PC/GDP, they have found that it causes growth for countries such as

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Guatemala, Honduras, Korea, and Sri Lanka. While it was found that growth does not cause financial depth measured by the ratio of M2/GDP and the ratio of PC/GDP in countries such as Spain, Costa Rica, El Salvador, Honduras, Mauritius, South Africa, Sri Lanka.

For the banking sector access, the results reveals that the null hypothesis which indicates that banking sector access measured by the ATM density does not cause economic growth is rejected at 5% significance level. This indicates that the causality runs from the banking sector access to economic growth. On the other hand, the null hypothesis that economic growth does not cause banking sector access measured by the banking density and the ATM density is rejected at 5% significance level for the ATM density and at 10% for banking density. This indicates that causality runs from economic growth to banking sector access.

For the efficiency of the banking sector, the results reveal that the causality is unidirectional and runs from economic growth to banking sector efficiency. This result is consistent with the empirical results of Awdeh (2012) who has conducted a Granger Causality test for the banking sector development and economic growth in Lebanon, where he has found that the banking sector efficiency measured by the interest rate spread does not cause economic growth.

For the banking sector stability, the results revealed the causality is unidirectional and runs from the banking sector

stability measured by the loan to deposit ratio to economic growth, which indicates that banking sector stability causes economic growth at 10% significance level.

For the causality between the real investment and economic growth, the results reveals that there is a casual relationship between real gross capital formation and economic growth at 1% significance level. While for the labor force, it is obvious that the null hypothesis that the labor force does not cause economic growth is accepted. This indicates that the increase in the size of the labor force does not affect economic growth and this may be attributed to the low productivity of labor in developing countries and the high percentage of unemployment. On the other hand, there is a causality runs from economic growth to the labor force, which indicates that economic growth causes an increase in the size of the labor force by increasing employment.

9. Conclusion

The main objective of the research is to estimate the impact of the banking sector development on economic growth in Egypt. To investigate the impact of the banking sector development on economic growth in Egypt, a multiple regression analysis was conducted by using the OLS method. The regression estimation results have revealed that the banking sector development has a positive and statistically significant impact on economic growth. In order to show the casual relationship between banking sector development and economic growth, a Granger Causality test

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was conducted. The test results revealed that for the financial depth, the causality is unidirectional which runs from the financial depth to economic growth. For the banking sector access, there is bidirectional causality between the banking sector access and economic growth. For the efficiency of the banking sector, there is unidirectional causality that runs from economic growth to the efficiency of the banking sector. For the stability of the banking sector, there is unidirectional causality which runs from the banking sector stability to economic growth.

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