

Macroeconomic Determinants of Banking Sector Development: A Comparison Study between Egypt and Saudi Arabia

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Abstract

This paper examines the macroeconomic determinants, such as economic growth, financial liberalization, trade openness, economic globalization and monetary policies, of the development of the banking sector in Egypt and Saudi Arabia. The study depends on the cointegration analysis to find out the long-run equilibrium relationship among the variables of the model. The results point out that economic growth has a long-run negative impact, whereas financial liberalization and real interest rate record a significant positive effect on credit to the private sector in both Egypt and Saudi Arabia. Economic globalization, however, seems to have just a significant positive effect in Saudi Arabia. Add to that, trade openness has a positive and significant effect on the credit to the private sector in Egypt whereas the growth rate of money supply exerts a positive and significant effect on the development of the banking sector in Saudi Arabia. This study reveals some implications for policy makers regarding the importance of liberalization policies and the need for further reforms in domestic banks to adapt with the requirements of globalization and global competition.

GEL classification numbers: E44, E51, E52, G21, C22.

Keywords: The development of the banking sector, credit to the private sector, financial liberalization, economic globalization, real interest rate, economic growth, trade openness, cointegration analysis.

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1 Introduction

The banking sector represents one of the fundamental pillars of the economy of any country where it plays a vital role in pushing the development and progress of economic and financial sectors. The success and progress of the commercial banking sector depend on several dimensions including in particular profitability growth and lending behavior. Since 1970s, there has been a significant change in the banking environment both domestically and internationally due to the rapid developments of banking activities as a result of the wave of financial liberalization and financial globalization. Developed countries actually completed the process of liberalization in the banking sector at the end of the eighties and early nineties of the past century, and then many developing countries initiated some economic reform programs which comprised the banking sector to increase its effectiveness and enhance its role in the economic development.

The concept of the development of the banking sector is a multi-dimensional concept and is not easy to find a single definition of this process as it is an interrelated process that includes improvements in the quantity and quality of financial services. Some of these dimensions are related to the mobilization of savings, credit granting and risk management. And thus the degree of the development of the banking system in any country is measured by its ability to deliver these functions efficiently.

This study tries to explore the macroeconomic determinants of the development of the banking sector as proxied by bank lending to the private sector in developing markets. This paper focuses on two developing countries Egypt and Saudi Arabia to find out whether there is a difference in the determinants of the development of the banking system from middle-income to high-income developing countries. The main research question in this study is that what are the main determinants of the development of the banking system in both Egypt and Saudi Arabia? Several macroeconomic variables such as economic growth, financial liberalization, trade openness, economic globalization and monetary policies are examined to reveal the actual factors explaining the behavior of the development of the banking sector in Egypt and Saudi Arabia. It is assumed that these determinants differ from one country to another according to conditions and characteristics of each country such as the degree of the development of banking services, the stage of economic development, the degree of financial liberalization, and the degree of economic, political and legislative stability.

The importance of this study backs to the vital role played by the banking sector in the economic development process and its role to provide the necessary funding for investments, which requires studying the main determinants that affect the development of the performance of these banks.

The paper is structured as follows: Section two discusses the literature review of most recent studies regarding the determinants of the performance of the bank sector. Section three gives a brief outline about some indicators of the bank development in Egypt and Saudi Arabia. Section four describes data, research methodology and model specification. Section five discusses the empirical results of this research, while section six includes conclusion and policy implications.

2 Literature Review

Some of literature review interested in exploring the determinants of the performance of the bank sector by focusing on the determinants of bank's profitability. In order to achieve its goal of maximizing the profitability, commercial banks face many factors that have different effects on its profitability. These factors can be grouped into external factors such as political, economic and legislative variables or internal factors related to bank specific features such as property rights, liquidity, size, risks and efficiency. Another group of literature review directed their attention to examine the determinants of the development of the banking sector which is reflected in its credit growth. This section discusses the most recent studies that empirically examined these dimensions.

Using unbalanced panel dataset of South Eastern European, Athanasoglou et al. (2006) investigated the determinants of bank profitability at bank, industry and macroeconomic levels over the period 1998-2002. Their results suggested that bank specific factors such as credit risk, capital ratio, size, and ownership were the main factors explaining the bank profitability performance except for liquidity risk which has insignificant effect. With regard to industry-related factors, concentration ratio positively affected bank profitability whereas index of banking system reform recorded a negative and significant effect on bank profitability. On the other hand, macroeconomic factors such as inflation showed positively and significantly influence on profitability, whereas real GDP per capita did not capture any significant effect on bank's profitability. Bennaceur and Goaid (2008) examined the impact of bank-specific factors, financial structure and macroeconomic variables on banks' profitability in the Tunisian banking sector through the period 1980-2000. Their results supported that individual bank characteristics explained a substantial part of bank profitability, whereas macroeconomic variables did not witness any significant impact on Tunisian banks' profitability. With regard to financial structure, findings of this study provided evidence that stock market development, ownership and interest rate liberalization were significant factors in explaining variations of profits of Tunisian banks. Another study by Alexiou and Sofoklis (2009) identified bank-specific and macroeconomic factors explaining the bank profitability in Greek over the period 2000 – 2007. The paper suggested that bank-specific factors such as size, credit risk, bank productivity, efficiency and liquidity are the main factors affecting bank profitability, whereas macroeconomic variables such as GDP, private consumption and inflation have an ambiguous and weak influence on bank's profitability. Using Johansen-Juselius cointegration test, Acaravci and Çalim (2013) addressed the bank specific and macroeconomic factors that affect the profitability of Turkish commercial banks over the period 1998 to 2011. This study also confirmed that bank specific determinants seem to be more effective than macroeconomic factors on banks' profitability.

On the other hand, Kosmidou et al. (2007) reached to different results when they examined the determinants of profits of Greek banks operating abroad in 11 nations. Their results indicated that the profitability of the parent bank and the experience of branches of these banks in host countries have a robust and positive effect on the profitability of these branches, whereas domestic financial factors, bank-specific factors and market specific factors were all insignificant in explaining the profitability of these subsidiaries. Ćurak et al. (2012) using a data set of 16 banks in the Macedonia showed that both internal and external factors have a significant role in determining bank profitability. They found that internal factors such as operating expense management, solvency risk and liquidity risk, as well as external factors such as economic growth, banking system reform and

concentration explained the variation of bank profitability in Macedonia. In an attempt to examine the effect of deposit dollarization as well as macroeconomic, financial and institutional variables on bank profitability, Kutan et al (2012) used a large sample of emerging market economies and illustrated that deposit dollarization has a negative impact on bank's profitability, whereas interest rate and economic growth seem to have a positive and significant effect on bank profitability. Findings of this paper also indicated that countries with strong institutions offset the negative impact of dollarization on profitability of their banks.

By examining the macroeconomic determinants of banking sector development in Malaysia, Yu and Gan (2010) supported that there is a significant positive relationship between banking sector development and real GDP growth, whereas financial liberalization has a negative impact on banking sector development. On the other hand, real interest rates and trade openness were not real determinants of the banking sector development. Another study by Guo and Stepanyan (2011) investigated the determinants of bank credit in 38 emerging market economies through the period 2001-2010. Their results showed that domestic deposits, GDP growth, liabilities to non-residents, and inflation rate have a positive and significant effect on private credit growth. Also, the results indicated that loose monetary conditions result in more credit. Also, Sharma and Gounder (2012) studied the influence of macroeconomic variables on changes in bank credit to private sector across six economies in the South Pacific over the period 1982–2009. Findings of their results support what Guo and Stepanyan (2011) reached that higher economic growth and deposit rate result in higher credit growth. However, rising average lending and inflation rates tend to have an inverse influence on credit growth.

Add to that, Constant and Ngomsi (2012) examined the bank-level and macroeconomics determinants of bank long-term loan behavior in the Central African Economic and Monetary Community and found that bank size, market capitalization, and GDP growth are the main factors that determine the ability of the bank to extend their business loans. Donia (2012) examined the determinants of banking sector development in 18 emerging economies through the period 2000-2009. By employing panel data and Dynamic Generalized Method of Moments estimations, this paper confirmed that the rule of law, economic growth and workers' remittances were the main factors that enhance the development process in banks, whereas factors such as financial and trade liberalization did not record a significant effect on the development of the banking sector. Using the Autoregressive Distributed Lag (ARDL) model, Imran and Nishat (2013) found that bank credit to the private sector in the long run in Pakistan is explained by the foreign liabilities, domestic deposits, economic growth, exchange rate, and the monetary conditions, whereas inflation and money market rate seem to have no effect on the private credit.

From the previous studies, it is clear that the determinants of both the profitability of the commercial banks and performance of the private credit of banks vastly differ across countries and regions as shown by the mixed evidences from previous studies about these factors. This confirms the wisdom that "one size doesn't fit all". Local conditions of each country or a group of countries may lead to different outcomes regarding the determinants of the performance of the banking sector. This study tries to extend the literature on the determinants of the development of the banking sector by focusing on macroeconomic determinants of private credit lending in two Arab countries; Egypt and Saudi Arabia.

3 Some Features of Bank Development in Egypt and Saudi Arabia

Egypt has witnessed a process of continuous development and reform of the banking sector in order to raise the level of its performance and its role in the national economy. This new phase comes after several phases undergone by the banking system in Egypt. The period after the revolution of 1952 to the beginning of the seventies of the last century showed the stage of nationalization and the integration of banks operating in Egypt. This has resulted in the formation of large-sized banking units and the banking system consisted of the central bank and four commercial banks belonging to the public sector as well as some specialized banks. The period from 1974 until the beginning of 1980s witnessed the beginning of the implementation of the open door policy where foreign banks were allowed to operate in Egypt. Accordingly, banking policy and mechanism performance and handling at this stage had been affected by increasing the degree of competition between banks and increasing funding of the banking system to the private sector.

During the 1980s, many actions had been taken to address some aspects of banking disturbances, which included amending some provisions of the Banking Law and credit, and strengthening the role of the central bank to tighten controls on banks, in addition to the controls on credit. This period was known as the stage of oriented credit. Since 1990 until the mid of 1990s, the Egyptian government launched the stage of liberalization and economic reform, which led to liberalizing the interest rate and exchange rate and changing the mechanism of financing the budget deficit through treasury bills. The most important characteristic of this stage is that the banking system became more positive with ongoing developments by playing an important role in stimulating the stock market through mutual funds, treasury bills, and buying shares of privatized companies.

Since 1997 until now, a number of policies and measures have been adopted to increase the role of the banking system in financing the investment and make banks more able to cope with the market demand. For instance, the Egyptian government has prepared an executive program aiming at reforming and recapitalization of banks, as well as the integrating the small entities to achieve an efficient application of the rules of financial control and supervision.²

On the other hand, Saudi banking system has been developed since the 1970s until now to become one of the most safe and efficient systems in the Arab region. The seventies decade of the last century had characterized as the stage of rapid growth and consolidation of the banking system. During this period, banks' assets grew from 3 billion riyals to 93 billion riyals, and deposits rose from 2 billion riyals to 68 billion riyals. The government announced, during the same decade specifically in 1976, for an important policy concerning the participation of foreign banks in Saudi Arabia. Foreign banks also benefited from the possibility of acquiring large shares in domestic banks as well as access to management contracts. By the year 1980, ten banks, out of the 12 banks in the Kingdom had a large share of foreign participation, and the number of bank branches rose to 247 branches (Aljaser, 2002).

During the 1980s, Saudi Arabian Monetary Agency (SAMA) took a series of procedures and actions to enhance risk management in banks. Add to that, SAMA introduced a number of advanced technology systems, including automated clearing system operations,

²Source: State Information Service, Your gate to Egypt:
<http://www.sis.gov.eg/En/Templates/Articles/tmpArticles.aspx?CatID=348#.UzANs8uKDIU>

automated teller machines and the use of the SWIFT system which led to an improvement of the efficiency of banking and financial services. The beginning of the 1990s coincided with the outbreak of the Gulf crisis. This crisis led to highly demanded withdrawal of bank deposits and converting them into cash as a precautionary measure to transfer these funds abroad, which caused a severe liquidity problem for banks. After the end of the Gulf crisis, there was a recovery in the economy and the banking activity witnessed rapid growth. Sudden fluctuations in oil prices and the difficult international situation, including the Mexican crisis in 1994 and the crisis in Southeast Asia in 1997, however did not affect the growth and profitability of Saudi banks during this period (Aljaser, 2002).

In general, the banking system in Saudi Arabia has witnessed a great development using the latest technology and varied banking products under the regulatory regime to meet the requirements of local legislation, and adhere to international standards as well, including the standard of the Basel capital adequacy. These actions made the Saudi banking sector to jump to the second group of 10 groups in the international assessment of the risks of global banking sectors, which included 86 countries from around the world in 2011. This new situation of the banking system in Saudi Arabia made it to be among the most secure financial systems in the world and the lowest risk sector in the Middle East after upgrading the rank within the risk assessment criteria (BICRA) from Level 3 to Level 2 (Bishi, 2011). Add to that, the banking sector in Saudi Arabia is characterized by low levels of non-performing loans, a strong ability to absorb the loss, stable profitability, a low cost deposit base, and a abundant liquidity. There are, however, high loan and deposit concentrations and there are fewer than twenty main commercial banks in Saudi Arabia with the four largest banks controlling about 60 percent of assets³.

4 Data, Methodology and Model Specification

4.1 Data

The present study investigates the macroeconomic factors that determine the development of the banking sector in two Arab countries; Egypt and Saudi Arabia. While political, cultural and legal environment may have a significant effect on the development of the bank sector, data availability of time series of these variables limits the analysis to macroeconomic factors. The study employs annual data series which are mainly sourced from the World Bank database⁴. The sample period covers from 1977 to 2012 for Egypt and from 1984 to 2012 for Saudi Arabia.

It is difficult to precisely measure the development of the banking sector as it is a wide concept and has several dimensions. Previous studies done so far depended on some quantitative indicators available for a long time series such as M2 to GDP ratio as a measure of financial deepening, the ratio of bank deposit liabilities to GDP, domestic credit to GDP, and the private sector credit to GDP that reflects how commercial banks are able to identify profitable investments, monitor managers, facilitate risk management, and mobilize savings. In this study and depending on data availability for long time series, the bank credit to the private sector as a percent of GDP (BCP) is used as a proxy

³Source: Saudi Arabia, Banking.

<http://fanack.com/en/countries/saudi-arabia/saudi-arabia-test/economy/banking/>

⁴TheGlobalEconomy.com, The World Bank

of banking sector development. This index measures the level of financial intermediation in the economy. This indicator has been used extensively in the literature to measure the efficiency of commercial banks through granting loans to the private sector to finance investments. Also, this index measures the degree of involvement of the banking system in providing facilities and loans to the private sector, and then it gives an impression of the extent of the development of banking system, especially to facilitate the process of exchange and diversify risk and the extent of the expansion of financial services as a reflection of the development of financial intermediation in the economy (Khalaf, 2011).

With regard to the independent variables, the study employs a group of macroeconomic determinants that are assumed to have a significant effect on banking sector development. These variables include economic growth, financial liberalization, trade openness, monetary conditions and economic globalization.

The linkages between economic growth and financial development Witnessed considerable debate among economists. Early economists such as Schumpeter(1911), Mckinnon (1973)and Shaw (1973) and later such as King and Levine (1993) clarified that financial development can boost economic growth through mobilizing saving, exerting control, allocating resources and improving innovation (The supply-leading hypothesis).On the other hand, other economists such as Robinson (1952) and Gurley and Shaw (1967) argued that economic growth can also be a causal factor for financial development. According to them, an increasing of economic growth leads to an increasing demand for financial services which in turn stimulates the financial sector (The demand-following hypothesis).

According to the results of several previous studies, economic growth(EG) is assumed to have a positive effect on of banking sector development especially in developing countries. EGmeasures the overall health of the economy, and thereby it is assumed to have a positive effect on the demand for credit. The rate of change of real GDP is used as a proxy of EG. An increase of the growth rate of real GDP is supposed to boost up the earnings of people and manufacturing sector as well. This in turn will be reflected in an increase of domestic deposits and consequently an increase of banks' liquidity which supports the ability of banks to lend more.

Financial liberalization recorded mixed results about its effect on BCP in literature review. In this study, I use FDI inflow as a percent of GDP as an indicator of financial liberalization. It is assumed that an increase of FDI inflow will enhance the performance of banking sector especially in developing and less developed countries. An increase of FDI inflow especially in banking sector can promote several positive aspects in the performance of the banking sector through providing innovative financial products, solving problems of inefficient management, reducing the ratio of non-performing assets, increasing financial stability, and helping to overcome the problem of poor capitalization.

Likewise, literature review indicated to a mixed effect of trade openness (TO) on banking sector development. However, it is assumed that trade openness has significant positive impact on the development of the banking sector especially for poor countries through better institutional quality. Kim et al. (2010) supported a positive impact of trade openness on banking sector development in lower-income countries but a negative long-run effect in high-income countries. In this study, TO is measured by the ratio of the sum of exports and imports to GDP.

With reference to monetary conditions, two variables can be used in this context; money supply and real interest rate. Money supply is represented by the annual growth rate of M_2 (GM2). It is assumed that an increase of M_2 leads to an increase of the credit to the private

sector. On the other hand, a positive real interest rate (RI) is assumed to boost banking sector development through promoting saving mobilization.⁵

Economic globalization (GLOB) is measured by the actual flows of trade, foreign direct investment and portfolio investment, as well as the restrictions applying to these flows. BCP is assumed to be positively affected by an increase of the volume business due to economic globalization, the process of bank mergers and economies of scale related to that process, the motivation of expansion and improvement of profitability due to liberalizing banking services. Negative impact of economic globalization on BCP however, is also possible due to the volatile capital flows, associated with social and economic risks. Add to that, the effects of economic globalization on the banking system does not only stand on the restructuring of the banking industry, but extends indirectly to the entry of non-banking financial institutions such as insurance companies and pension funds as a strong competitor to the commercial banks in the field of financial services, which leads to a decline in the role of commercial banks in particular in the field of financial intermediation (Alnil, 2005).

To test the possibility of multicollinearity problem, the variance inflation factor (VIF) test is conducted. VIF estimates how much the variance of an estimated parameter of the regression model increases if your predictors are correlated. A VIF more than 5 indicates high correlation and thus refers to the existence of multicollinearity problem. Table (1) shows VIF estimates for all the independent variables in both the Egyptian and Saudi Arabian cases. The results indicate that there is a possible multicollinearity problem in the Egyptian model due to the variable GM2 (VIF = 5.29) and the same problem exists in the other model of Saudi Arabia where VIF of TO is 4.69. Therefore, I dropped GM2 from the Egyptian model and TO from Saudi Arabian model to overcome this problem and re-estimated the VIF test for both models. After excluding these variables, this problem has been solved in both models.

Table 1: VIF test of Multicollinearity

Variable	VIF (Egypt)		VIF (Saudi Arabia)	
	(1)	(2)	(1)	(2)
EG	1.60	1.23	1.37	1.37
FDI	1.54	1.43	3.30	1.54
TO	1.68	1.40	4.69	-
GM2	5.29	-	1.86	1.58
RI	1.32	1.13	2.19	2.08
GLOB	3.35	1.25	1.27	1.23

4.2 Unit Root Test for Stationarity

⁵ RI for Saudi Arabia is measured by the difference between Interest rates on bank deposits in Saudi Riyals (12 Months) and inflation rate. Inflation rate in Saudi Arabia is measured by the percent change in the Consumer Price Index. Data of Interest rates on bank deposits and consumer price index in Saudi Arabia are collected from Saudi Arabian Monetary Agency, the annual report, different issues. Data of other variables in the estimated models are collected from TheGlobalEconomy.com, The World Bank.

One of the main problems faced by researchers when using time-series data is the problem of non-stationarity of series. This problem is likely to lead to spurious regression results which in turn lead to improper statistical inference, and a spurious correlation among variables. These spurious results indicate that the mean and variance calculated from non-stationary variables (in levels) would be biased estimates of the unknown population mean and variance. Therefore, using one or more non-stationary series in the model results in biased estimates and thereby leading to invalid statistical inference when estimating these series in levels. In this case, the regression coefficients seem to be statistically significant even though there is no casual relation between the variables. It is therefore very important to find out if the relationship between economic variables is spurious or nonsensical. If the relations between variables of the model are specified in the first differences instead of levels, this means that we can overcome the difficulties of nonstationarity as in most cases the first difference of series is usually stationary (Gujarati, 2007 & Harris, 1995).

Dickey and Fuller (1979) designed a procedure to test whether the series has a unit root or it follows a random walk. There are four forms of the unit root test that can be applied. All these forms assume that the null hypothesis is that the series has a unit root. The main difference between these forms is whether the model used to conduct the unit root test has a constant term and time trend.

To decide which form to use, this requires some investigation of the data. A visual plot of the data is usually the first step in the analysis of any time series. Therefore, I plot the variables over time to check whether there is an upward trend over time or not. If the series does not include a trend, then it is preferable to estimate the model of the unit root test without a trend. The first impression that I get from these graphs is that all the time series do not show a time trend except for BCP and GOB in Egypt and BCP, RI and GM2 in Saudi Arabia. Therefore, it is assumed that the variables follow a random walk for variables without time trend. There are two types of random walks; random walk without drift (no constant or intercept term, equation (1)) and random walk with drift (a constant term is present, equation (2)).

$$Y_t = \delta Y_{t-1} + u_t \quad (1)$$

$$Y_t = \alpha + \delta Y_{t-1} + u_t \quad (2)$$

These two equations can be rearranged as follow:

$$\Delta Y_t = \rho Y_{t-1} + u_t \quad (3)$$

$$\Delta Y_t = \alpha + \rho Y_{t-1} + u_t \quad (4)$$

Where $\rho = \delta - 1$

The DF test based on the above equations assumes that the disturbances in the model, u_t , is uncorrelated. But in the case the u_t are correlated, Dickey and Fuller provided an extension of this test known as the Augmented Dickey- Fuller (ADF) test which accommodate this serial correlation by adding the lagged values of the dependent variable (ΔY_{t-1}) to the right hand side of the model (Greene, 2012). Due to the shape of the plotted series, the Augmented Dickey-Fuller (ADF) test is conducted with time trend time

for BCP and GOB in Egypt and BCP, RI and GM2 in Saudi Arabia, and without time trend for other variables.

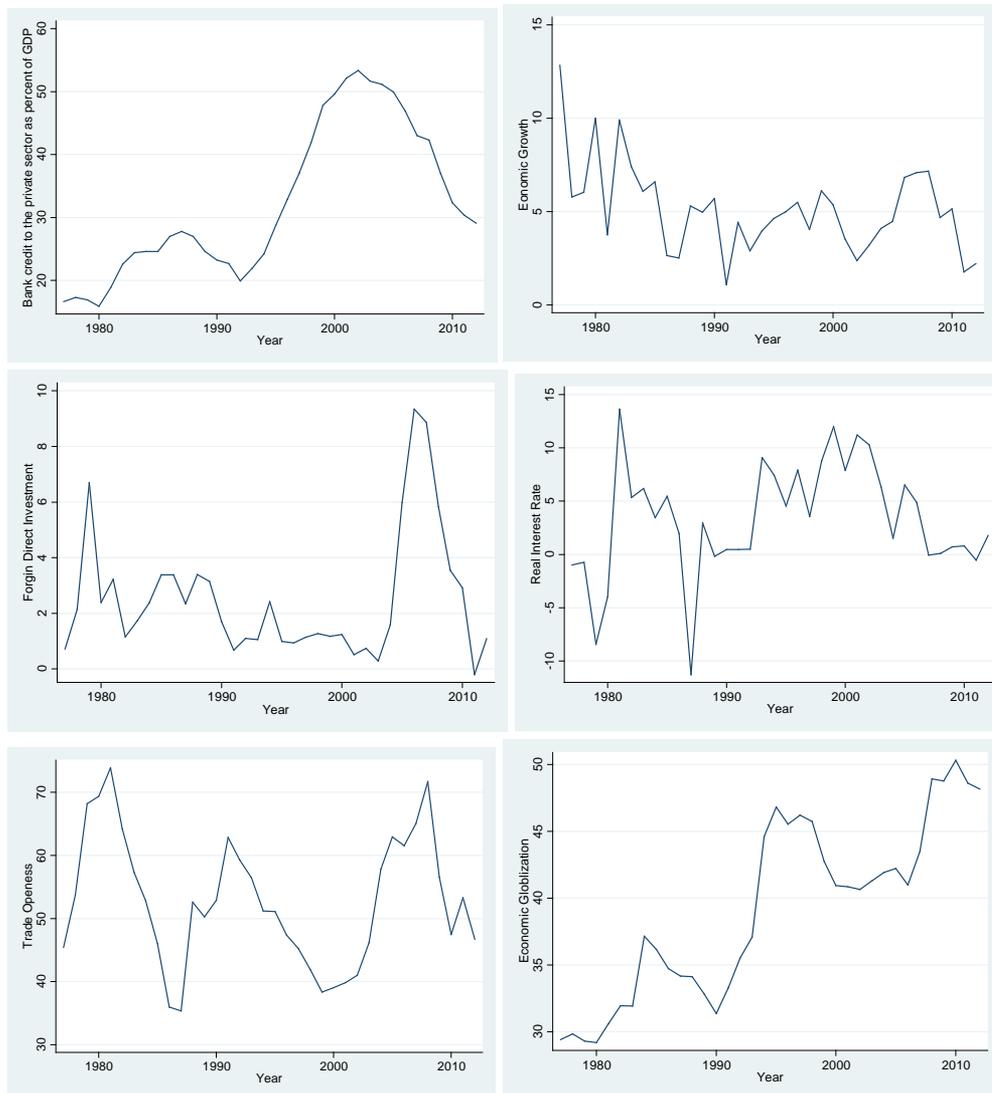


Figure 1: A plot of the Egyptian time series data.

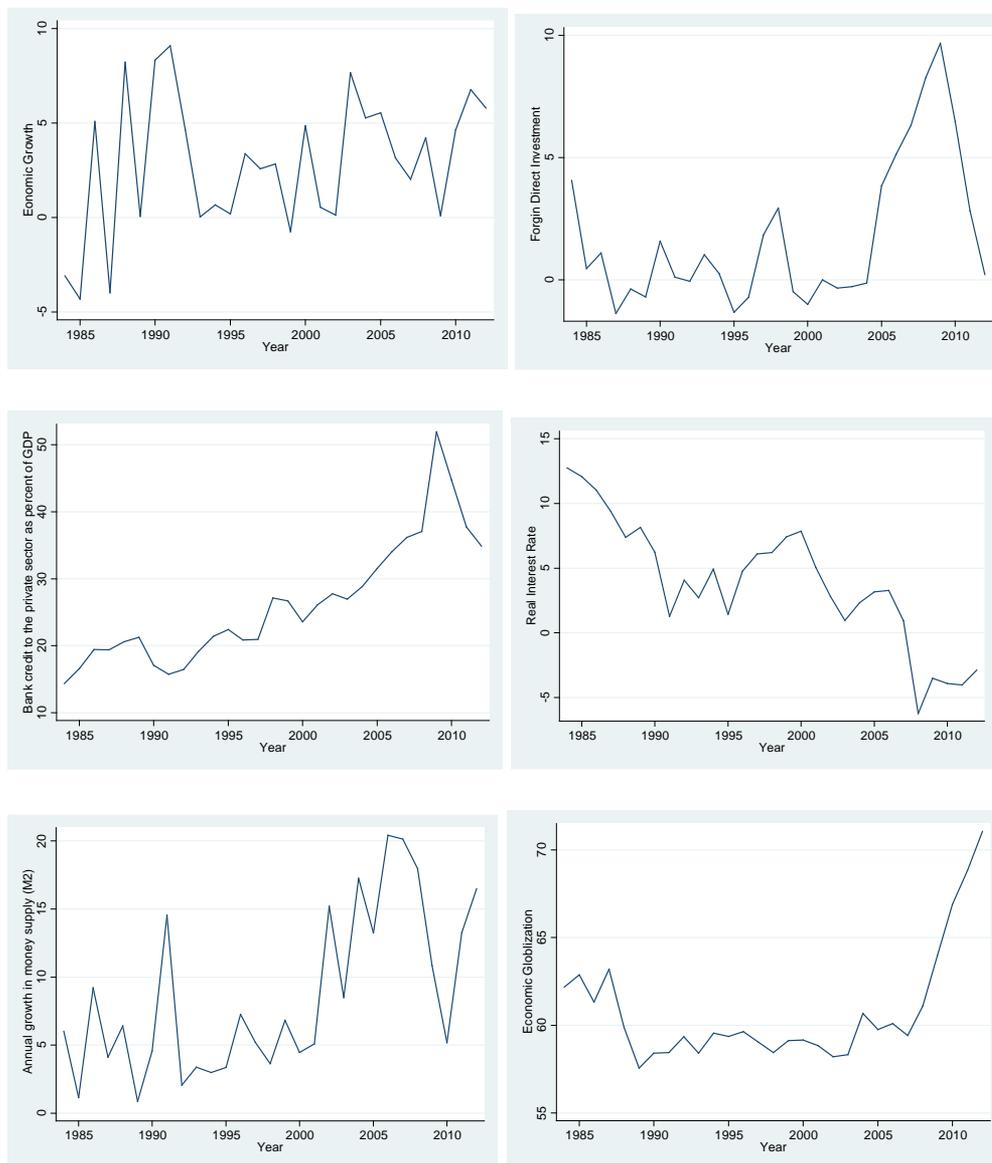


Figure 2: A plot of Saudi Arabia time series data.

Results of table (2) indicate that all variables are non-stationary in levels and therefore the null hypothesis that these series exhibits a unit root can't be rejected. However, the results show that all series are stationary in first difference whether in Egypt or in Saudi Arabia. This result means that these variables are integrated of order one $I(1)$, and therefore it is possible to set up a model that lead to stationary relations among these variables (a cointegration model), which suggests that there is a long-run equilibrium relationship among these variables. In other words, if the two series in the model are $I(1)$, then the partial difference between them might be stable around a fixed mean $I(0)$ which means that the linear combination cancels out the stochastic trends in the two series, and then these two series are said to be cointegrated (Greene 2012).

$$\varepsilon_t = Y_t - \beta X_t \quad (5)$$

Table 2: Results of Augmented Dickey-Fuller (ADF) unit root test.

Variables	Level		1 st Difference	
	Egypt	Saudi Arabia	Egypt	Saudi Arabia
BCP	-1.804	-2.835	-2.271*	-4.249*
EG	-1.438	-1.366	-6.721**	-5.290**
FDI	-1.762	-1.832	-4.309**	-2.853**
RI	-1.634	-2.271	-6.731**	-3.798*
TO	-0.664	-	-4.310**	-
GM2	-	-2.642	-	-4.482**
GLOB	-2.784	0.877	-4.532**	-3.919**

Note: * indicates rejection of null hypothesis of non-stationary at 5%,

** indicates rejection of null hypothesis of non-stationary at 1%.

ADF test is conducted with time trend for variables BCP and GOB in Egypt and variables BCP, RI and GM2 in Saudi Arabia, but without time trend for other variables.

From the previous analysis, we conclude that if the two series are integrated of the same order, then there is a long-term, or equilibrium, relationship between these two series as cointegration ties the variables together in the long run. In the short run, however, there may be disequilibrium and the variables can be moving in different ways. Therefore, the error term in equation (5) can be treated as the “equilibrium error.”

4.3 Model Specification

Recent literature in this context has shown that there are two broad approaches for testing for cointegration. The first approach was by Engle and Granger (1987) based on the error correction mechanism (ECM). The Engle and Granger framework is based on two-step estimation procedure. First, cointegration test is conducted by estimating the statistic relationship between economic variables using the OLS and applying the unit root test to the residuals. If the error term was stationary, this means that these variables are cointegrated. Then, in the second step the residuals from the static regression as an error correction term is used in a dynamic first-difference regression as shown in equation (6) to reveal the short run relationship between variables.

$$\Delta Y_t = \beta_0 + \beta_1 \Delta X_t + \beta_2 \varepsilon_{t-1} + \omega_t \quad (6)$$

Where ε_{t-1} is one-period lagged value of the error from the cointegrating regression, and the absolute value of β_2 determines how quickly the equilibrium is restored.

However, Engle - Granger approach has some shortages, particularly with small samples and when there are more than two variables in the model. In this case, Johansen's approach is favored in handling multivariate models and small samples. This approach developed by Johansen (1988, 1991) and Johansen and Juselius (1990) builds cointegrated variables directly on maximum likelihood estimation instead of relying on OLS procedures. Johansen derived the maximum likelihood estimation using sequential tests for determining the number of cointegrating vectors. He proposes two different likelihood ratio tests namely the trace test and the maximum eigenvalue test. This

procedure has the advantage over the Engle-Granger method because it can estimate more than one cointegration relationship, if the data set contains two or more time series.

This paper employs Johansen-Juselius cointegration approach. Johansen's method of cointegration depends on the vector autoregression (VAR) model as in equation (7):

$$\Delta Y_t = \pi_1 \Delta Y_{t-1} + \pi_2 \Delta Y_{t-2} + \dots + \pi_{p-1} \Delta Y_{t-p+1} + \mu Y_{t-p} + u_t \quad (7)$$

The primary objective of Johansen cointegration procedure is to find out the number of cointegrating vectors in the VAR model. If the number of cointegrating vector (r) is zero, then we can assume that there is no long run relationship among variables. This procedure generally produces two types of likelihood test statistics; the trace test λ_{trace} and the maximum eigenvalue test λ_{max} . The hypothesis that there is at least one cointegrating vector in the model cannot be rejected if both λ_{trace} and λ_{max} are found to be significant.

The trace test tests the null hypothesis of (r) cointegrating vectors against the alternative hypothesis of (p) cointegrating vectors. The test statistic is given by:

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^p \ln(1 - \hat{\lambda}_i) \quad (8)$$

The maximum eigenvalue test, on the other hand, tests the null hypothesis of (r) cointegrating vectors against the alternative hypothesis of ($r+1$) cointegrating vectors (Ssekuma, 2011). This test statistic is given by:

$$\lambda_{max}(r, r+1) = -T \ln(1 - \hat{\lambda}_{r+1}) \quad (9)$$

5 Empirical Results

Tables 3 and 4 report the results of Johansen tests for co-integration. The results in table 3 indicate that the value of trace statistic in the first hypothesis ($H_0: r = 0$) is more than the critical value at the level of significance of 5% in Egypt and 1% in Saudi Arabia, and then we reject the null hypothesis that there is no vector of cointegration and accept the alternative hypothesis that there is at least one vector of cointegration. The second hypothesis ($H_0: r \leq 1$) however isn't rejected as the trace statistic is less than the critical value. This means that there is a unique vector of cointegration between variables.

Table 3: Results of co-integration test (trace test)

	No. of CE(s)	H_0	Trace Statistic	0.05 Critical Value	Prob.
Egypt	None *	$r = 0$	104.04	95.75	0.012
	At most 1	$r \leq 1$	62.65	69.82	0.163
	At most 2	$r \leq 2$	32.47	47.85	0.586
Saudi Arabia	None **	$r = 0$	107.50	83.94	0.001
	At most 1	$r \leq 1$	57.21	60.06	0.085
	At most 2	$r \leq 2$	32.46	40.17	0.239

Note: * indicates rejection of null hypothesis of non-stationary at 5%,
 ** indicates rejection of null hypothesis of non-stationary at 1%.

This result is confirmed by the results of the maximum eigenvalue test in table 4. The calculated value of the maximum eigenvalue exceeds the critical value at the level of significance of 5% for Egypt, and 1% for Saudi Arabia in the first hypothesis ($H_0: r = 0$), but is less than the critical value in the second hypothesis ($H_0: r \leq 1$). This result refers to the existence of one vector of cointegration. Therefore, the trace test and the maximum eigenvalue test indicate to the presence of a unique long-term or equilibrium relationship between variables.

Table 4: Results of co-integration test (maximum eigenvalue test)

	No. of CE(s)	H_0	Max Eigen Statistic	0.05 Critical Value	Prob.
Egypt	None *	$r = 0$	41.389	40.08	0.035
	At most 1	$r \leq 1$	30.183	33.88	0.130
	At most 2	$r \leq 2$	12.572	27.58	0.907
Saudi Arabia	None **	$r = 0$	50.291	36.63	0.001
	At most 1	$r \leq 1$	24.748	30.44	0.217
	At most 2	$r \leq 2$	13.086	24.16	0.685

Note: * indicates rejection of null hypothesis of non-stationary at 5%,
 ** indicates rejection of null hypothesis of non-stationary at 1%.

After verification of the existence of a long-run cointegrated relationship between BCP and the independent variables, the regression equation of cointegration is estimated as shown in Table 5.

Table 5: Estimation of the long-run coefficients

Variable	Egypt			Saudi Arabia		
	Coefficient	Standard Error	t-value	Coefficient	Standard Error	t-value
EG	-5.218**	1.042	-5.01	-6.226**	1.043	-5.97
FDI	3.729**	0.886	4.21	-2.255	1.158	-1.95
GOB	0.409	0.249	1.64	0.304*	0.120	2.53
RI	3.223**	0.383	8.42	1.835*	0.731	2.51
TO	0.580**	0.195	2.97	-	-	-
GM2	-	-	-	3.562**	0.564	6.32

Note: * indicates rejection of null hypothesis of non-stationary at 5%,
 ** indicates rejection of null hypothesis of non-stationary at 1%.

Contrary to the results of most previous studies, economic growth seems to have a long-run negative effect on private credit in both Egypt and Saudi Arabia which is statistically significant at 1%. One explanation of this negative relationship is that the increase in the rate of economic growth is often accompanied by an increase of the average per capita income, which leads to a decline in individuals' demand to finance their purchases through borrowing, especially in Saudi Arabia. Add to that, the increase of the rate of economic growth accompanied by an increase in inflation rates directly affects the interest rates on loans and leads to increasing the cost and risk of borrowing. This consequently results in the reluctance of individuals to finance their purchases through loans and

resorting to alternative ways to finance their purchases, such as installment sales, particularly with the fear and belief of many individuals that these sorts of loans are not allowed in Islam.

Moreover, in Egypt, an increase of the rate of economic growth was accompanied by an increase in remittances, which have become a substitute for borrowing from the banking system to finance the purchases of households that receive their remittances. Also the presence of other financing formulas in Islamic banks, especially in Saudi Arabia such as Murabaha and participation and with the increase in the rate of economic growth and the need for institutions to finance their new investments promoted investors to shift to these Islamic formulas and decrease their demand to finance their investments through loans.

In addition to the above, the increasing rate of economic growth has witnessed a development and expansion in the stock market in both Egypt and Saudi Arabia. As a result, many business enterprises have switched to rely on financing their new investments through issuing new shares or borrowing directly through the bond market.

The results also support that FDI as a proxy of financial liberalization has a significant positive effect on credit to the private sector which indicates that allowing foreign banks to operate in the domestic market, in addition to other measures of liberalizing the capital market develop well-functioning banking sectors through improving efficiency of banks' risk management and adopting sophisticated technology. However, in Saudi Arabia, there is no evidence that foreign inflows has a significant effect in stimulating private credit growth as domestic savings constitute the main factor responsible for the growth of credit. Concerning the economic globalization, findings of this paper show that economic globalization has insignificant effect on the credit to the private sector in Egypt although this effect is positive and significant at 5 percent in Saudi Arabia. This result indicates that the positive and negative effects of globalization on the development of banking sector in Egypt are normalized, whereas the positive effects of globalization such as attracting investment, increasing commercial activities and economics of scales due to mergers between banks are predominant in the Saudi banking sector.

Add to that, real interest rate records a positive and significant effect on the development of the banking sector in both Egypt and Saudi Arabia, however this effect is more powerful in Egypt. This result comes in line with the implications of McKinnon (1973) which indicate that increase in the real interest rate stimulates more savings and thus increases the supply of credit.

On the other hand, the results show that trade openness has a positive and significant effect on the credit to the private sector in Egypt. This implies that liberal trade policies have a significant impact on banking sector development. This result is compatible with the results of Huang and Temple (2005) and Kim et al. (2010) who supported that trade openness has significant positive impact on financial development especially for lower income countries.

Finally, monetary policy as expressed by the growth rate of money supply exerts a positive and significant effect on the development of the banking sector in Saudi Arabia. One possible explanation is that expansionary monetary policy during the study period boosts the credit growth of the banking sector, particularly with a stable exchange rate of the Saudi Riyal.

6 Conclusion and Policy Implications

This study examines the macroeconomic determinants of the development of the banking sector as proxied by credit to the private sector in Egypt and Saudi Arabia. Several macroeconomic variables such as economic growth, financial liberalization, trade openness, economic globalization and monetary policies are examined to reveal the actual factors explaining the behavior of the development of the banking sector. The importance of this study backs to the vital role played by the banking sector in the economic development process and its role to provide the necessary funding for investments. The first stage of the empirical part of this study aims to reveal whether there is multicollinearity problem and handle this problem, then a unit root test is conducted to detect whether the variables used are stationary or not. The results indicate that all series are stationary in first difference which means that these variables are integrated of order one I(1). Therefore, a cointegration model based on Johansen (1988, 1991) and Johansen and Juselius (1990) is estimated to find out the long-run equilibrium relationship among the model's variables.

The results of the regression equation of cointegration point out to the existence of one vector of cointegration in both Egypt and Saudi Arabia. Economic growth seems to have a long-run negative impact on credit to the private sector, whereas financial liberalization and real interest rate record a significant positive effect on credit to the private sector in both Egypt and Saudi Arabia. Economic globalization, however, seems to have just a significant positive effect in Saudi Arabia. Add to that, trade openness has a positive and significant effect on the credit to the private sector in Egypt whereas the growth rate of money supply exerts a positive and significant effect on the development of the banking sector in Saudi Arabia.

This study reveals some implications for policy makers as it sheds some light on the importance of liberalization policies in the banking sector while taking into consideration the quality of the current institutional infrastructure and the soundness of macroeconomic policies. Moreover, the study confirms the need for further reforms in domestic banks to adapt with the requirements of globalization and global competition. The study also suggests further research to be done on the determinants of the development of the banking sector, especially those relating to the political and legislative factors as well as those relating to the characteristics of the banking sector itself.

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