

AN EMPIRICAL INVESTIGATION OF THE ROLE OF THE EGYPTIAN BANKING SECTOR IN ATTENUATING THE VIRULENCE OF FINANCIAL CRISES

*Monal Abdel-Baki**

Abstract

The aim of this paper is to compare the relative efficacy of Egyptian public, private and foreign banks in alleviating adverse macroeconomic meltdowns inflicted by financial crises by employing the Pedroni Fully Modified Ordinary Least Squares (FMOLS) method. The research contrasts two financial reforms: the liberalization phase of 1991-2003 to the Banking Reform Plan (2004-2009). The results of the study reveal that financial reforms have rendered foreign and domestic private banks more efficient in enhancing credit flow to the real sector, whilst making state-owned banks more successful in mobilizing savings during financial crises.

Keywords: financial crisis, banking sector, GDP growth, inflation, unemployment

* All correspondence and requests for reprints may kindly be addressed to:

Monal Abdel-Baki, PhD,

Department of Economics, School of Business,

The American University in Cairo

AUC Avenue, P.O. Box 74, New Cairo 11835, Egypt

Tel: (202)2615-3248, Fax: (202)2795-7565, monalbak@aucegypt.edu

1. Introduction and Background

Since 1991, the Central Bank of Egypt (CBE) has made various attempts to reform its banking sector. However, the common grievance of both economists and financial specialists is that these reform efforts have not created a banking sector adequately impervious to financial shocks. In 1997, the waves of the Asian Crisis echoed in the Egyptian banking sector leading to massive non-performing loans (NPLs). Instantaneous banking supervision was introduced, regrettably only to lead to another minor home-made calamity culminating in more bad debts in 2003. This was when a collectively incessant and thunderous call for the vigorous regulation of banks was put to action. The CBE embarked on a full-fledged reform process in 2004 that addressed most of the previous regulatory loopholes.

Shortly afterwards, the global financial crisis took its toll on the world. The repercussions for the Egyptian economy could have been far worse if the reforms of the domestic financial sector were not already in place. Due to the strict prudential controls introduced in 2004, Egyptian banks neither suffered from illiquidity nor toxic assets, which were the most pronounced reasons for bank failure and economic growth collapse. It may be true that Egyptian banks have not been exposed to asset write-downs, yet the loan to deposit ratio plummeted from an already notoriously low 54.4% in 2007 to a meager 52.65% in September 2009. This renders the copious liquidity and solid assets futile. The result was that the level of investment to GDP plunged from 22.3% to 19.9% of GDP for the same period. To add insult to injury, the expansionary monetary policy, through

slashing the discount rate six consecutive times throughout 2009, has reduced the rate of national savings to a pathetic level of 12.7% from the already low rate of

16.2% of GDP. This has come as a surprise to policymakers who had hoped that the banking sector would be able to foster both savings and investment especially during similar episodes.

Hence, this paper will attempt to test the role of banking reforms in buttressing Egyptian banks to help mitigate the effects of financial crises on the economy. In this context, the banking sector is divided into four different categories by ownership and type comprising of: public commercial, public specialized, private domestic and private foreign banks. The Pedroni Fully Modified Ordinary Least Squares (FMOLS) method is utilized to compare and contrast the efficacy of each category of banks with regards to achieving the three prime macroeconomic goals of GDP growth, stabilizing inflation and creating jobs. Additional inputs that are selected as measures of attaining these goals are the volume of customer deposits, growth-triggering loans, and advances to the Ministry of Finance. The main aim of building the empirical model is to compare the two reform phases, the first lasting from 1991 to 2003 against the second extending from 2004 to 2009. The purpose of the comparison is to test the development of the effectiveness of different categories of banks consequent to the two reforms. The results of the research culminate in a set of precautionary reforms to shield the economy from future financial crises.

The Pedroni Fully Modified Ordinary Least Squares (FMOLS) method is utilized to compare and contrast the

efficacy of each category of banks with regards to achieving the three prime macroeconomic goals of GDP growth, stabilizing inflation and creating jobs. Additional inputs that are selected as measures of attaining these goals are the volume of customer deposits, growth-triggering loans, and advances to the Ministry of Finance. The main aim of building the empirical model is to compare the two reform phases, the first lasting from 1991 to 2003 against the second extending from 2004 to 2009.

The purpose of the comparison is to test the development of the effectiveness of different categories of banks consequent to the two reforms. The results of the research culminate in a set of precautionary reforms to shield the economy from future financial crises.

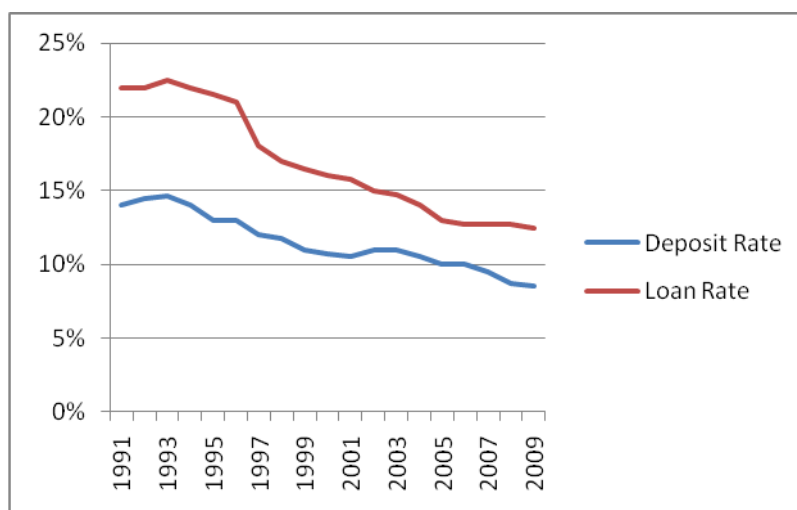
The Two Banking Reform Attempts in Egypt

The Initial Banking Reform Phase and the General Structural Overhaul (1991-2003)

Similar to many emerging market countries, Egypt has been exposed to a number of viscous banking and financial crises especially during its first steps towards economic restructuring and liberalization. Consequent to mounting foreign debt amounting to \$48 billion, galloping double-digit inflation and a deepening fiscal budget deficit the Egyptian government adopted the so-called Economic Reform and Structural Adjustment Program (ERSAP) in 1991. This is very much the replicated Structural Adjustment Program implemented by a number of emerging nations during the same phase in collaboration with the International Monetary Fund.

ERSAP developed more effective financial instruments to manage liquidity, liberalize interest rates and float the Egyptian pound. Moreover, monetary and regulatory authorities were granted more autonomy.

Most of the macroeconomic problems were addressed at this point, but a serious flaw of the program was the attraction of private funds into the banking sector and the instigation of financial markets prior to the introduction of adequate regulatory and supervisory regimes (Korayem 1997). The eventual result was a series of bank failures and piling non-performing loans. The first reform started in response to the 1997 banking crisis in Egypt where the CBE imposed strict capital requirements forcing Egyptian banks into involuntary mergers and acquisitions (M&As). This resulted in more banking concentration reducing the number of banking units from 82 in 1991 to 61 in 1998. Similar to multiple cases of enhanced banking concentration, the spread between the lending and borrowing rates widened (Berger and Hannan 1998). As shown by Figure (1), the interest rate spread was excessively high in Egypt and did not start to narrow till the reform measures taken by the CBE in 1997. These reforms comprised of strict and prudential controls of credit to address the problem of NPLs. Also, more M&As were imposed on banks in order to meet stringent capital requirements. In spite of these measures there was another banking crisis in 2003 indicating the need for further reforms. This was when the CBE embarked on its Banking Reform Plan in 2004, with the prime aim of building a competitive and sound banking system able to provide modern and efficient financial services and to cushion the economy against both internal as well as external financial shocks.



Source: Central Bank of Egypt. Annual Report, various issues.

Figure 1. Spread between Deposit and Loan Rates in Egypt (1991-2009)

The Banking Reform Program (2004-2009)

The Banking Reform Plan (BRP) is a dual-stage and multi-pillar plan that aims to consolidate and enhance the over-banked yet, under-branched banking sector. The BRP cost LE 50 billion (\$9 billion) and was partly financed through a \$500,000 loan from the World Bank.

The initial stage of the BRP (2004-2009) rested on four pillars. The first was to consolidate the banking sector through both enforced and voluntary mergers and acquisitions. During this stage most state shares in joint-venture banks were privatized. The forced M&As were attributed to the inability of smaller banks to meet the 8% capital adequacy in accordance with the guidelines of

Basel Accord II. Moreover, the third largest state-owned commercial bank, Bank of Alexandria, was privatized in a public bid in 2006 for 5.4 times of its book value. Accordingly, the number of banks contracted from 57 in 2004 to 39 in 2009. The second pillar was to establish the Banking Reform Unit to help with financial and managerial restructuring of the remaining public banks. Third, the NPL unit at the CBE was founded to assist with the resolution of non-performing loans. The fourth pillar was to upgrade the supervision of commercial banks by the Bank Supervision Department (BSD).

The CBE has initiated the second stage of its BRP in January 2010. During this phase, the main concern is the enhancement of the BSD. Second, Egyptian banks are obliged to install rigorous internal auditing practices. Third, the entire banking sector is required to strictly abide by the requirements of the Basel Accord II in order to upgrade its credit, market and operational risk management practices, rather than simply meet the capital adequacy requirement where the ECB will provide technical assistance to Egyptian banks (CBE 2009). Lastly, the CBE obliges banks to submit a contingency plan under stress testing scenarios.

Subsequent to the BRP, the Egyptian banking sector still stands as the backbone of the Egyptian financial system since it accounts for over 60% of total assets. Banking is dominated by state ownership which accounts for more than 54% of total deposits. Public banks have a relatively extensive branch network and equity capital. Although private banks are growing faster than their public counterparts, they remain relatively small, with modest branching. Table (1) divides the Egyptian banks by ownership and displays the consolidation of the banking sector through M&As after the first phase of the Bank Reform Plan. The six state-owned banks have more than half the market share and hence, the collective performance of the banking sector highly depends on the performance of these banks. The rest of this paper endeavours to compare the efficacy of different bank categories in achieving macroeconomic stability especially in the face of financial crises. This comparison is helpful in directing future steps of the government in promoting the type of bank ownership that best helps in financial stability. This is a highly timely issue given the current inclination towards privatizing state-owned banks.

Table 1. Changes in the Structure of the Egyptian Banking Sector (2004 - August 2009)

	2004		August 2009	
	# of Banks	# of Branches	# of Banks	# of Branches
Public Commercial Banks (A)	4	959	3	846
Public Specialized Banks (B)	3	1251	3	1254
Private Domestic Banks (C)	33	636	26	1224
Private Foreign Banks (D)	17	59	7	83
TOTAL	57	2905	39	3407

Source: Central Bank of Egypt. *Economic Review*, various issues.

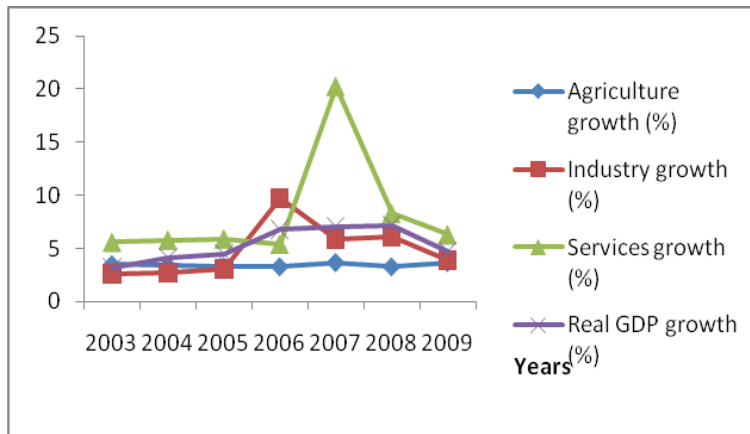
The Repercussions of the Current Global Financial Crisis on the Egyptian Economy

The global recession has affected the Egyptian economy on a number of fronts. The strains of the financial turmoil led to a sharp drop in equity prices on the Egyptian Stock Exchange by more than 40% from the outbreak of the crisis till October 2009. While the real estate net worth was not radically influenced, the major sources of revenue for Egypt, namely the Suez Canal earnings, tourism revenue and export proceeds translated into a current account deficit of US\$3.4 billion. FDI declined from \$13.2 billion in 2007/08 to the current level of \$4 billion. Even the allegedly sole improvement, of the decline in the ratio of outstanding external debt to GDP from 21% in June 2008 to 16.7% in August 2009, merely stemmed from a depreciation of US\$ 2.1 billion in most currencies versus the US dollar.

Slower GDP Growth and the Contraction of the Productivity of Economic Sectors

Egypt is the most populous country in the Middle East; its explosive population grows at an annual rate of 2.08% producing a predominantly young and unproductive

populace where 44% of individuals fall in the age-group of 0-20 years. Undoubtedly this has led to burgeoning demand with 40% of Egyptian households earning excessively low income. Even though the meltdown in Egypt has not been detrimental compared to many other emerging economies, the decline in GDP growth rates from 7.2% in 2008 to 4.7% in September 2009 is surely apt to have long-term repercussions on the living standards of the already impoverished population. Figure (2) reveals that the global recession has mostly affected the industrial and service sectors, with almost no effect on agricultural production. While demand for real estate units has not dropped, the construction sector was adversely distressed due to a slowdown in Arab investments in Egypt. In spite of establishing the Egyptian Mortgage Refinance Company to act as the mortgage market maker, the cutting of real estate registration fees from 12% to 3% and the slashing of the tax rate from 46% to 10% the construction sector has staggered (GIH 2008). This is due to a cultural factor that impedes demand for mortgages, where the mortgage lending level in Egypt is below 1% of GDP, compared to 65% in USA, 45% in Europe and 14% in UAE.



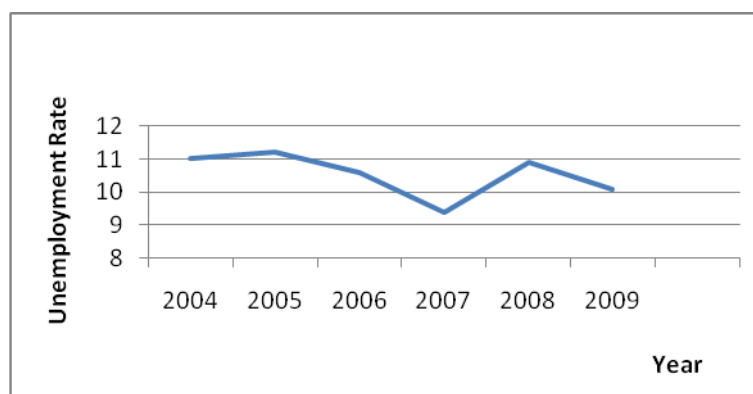
Source: Economist Intelligence Unit. *Country Report: Egypt*, various issues.

Figure 2. Real Growth Rates of GDP and Economic Sectors (2003-2009)

Undoubtedly, the high consumption expenditure by the exploding Egyptian population as well as the \$5.5 billion fiscal stimulus package have kept the manufacturing sector from shrinking (EIU, 2009). But the decline in foreign demand contracted Egyptian industrial exports by 14.26% during 2009 (CBE, 2009). Also, the cargo traffic in the Suez Canal that decreased by 27.8% reduced earnings by 8.9% (SCA 2009). Yet, populous nations can offset such negative effects by stimulating domestic savings, where the main burden lies on the banking sector.

The Recurrence of High Unemployment Rates

Another stubborn problem facing Egypt is high unemployment prompted by the high redundancy rate due to the privatization program. The predicament lies in the fact that 88.6% of the unemployed are between the ages of 15 and 30. Yet, unemployment eased in view of the large withdrawal of females from the labour force especially after the slowdown in government hiring. Another factor that has helped to condense the unemployment level is the growth in private sector employment by 8% from 1998 to 2006 (Assaad 2007). Yet, the unacceptable rates of inflation that delayed the expansionary program have done little to help with job creation. Figure (3) displays that after declining in 2005 unemployment started to rise again in mid-2007, given the contractive policies of the Egyptian fiscal and monetary agents in their quest against inflation.



Source: Central Bank of Egypt (2009): Monthly Statistical Bulletin, September, pp. 119-20.

Figure 3. Unemployment Rates (2004-2009)

Yet, one must enter the caveat that unemployment figures do not capture the factual situation. Egyptian expatriates amount to 5 million, where 2 million work in Arab oil-rich nations. Workers' remittances, a major source of foreign earnings for Egypt, have plummeted by

23.5% since the global recession, indicating that many expatriates have returned to Egypt. Thus, the homecoming of hundreds of thousands of Egyptian expatriates may not have been documented yet.

Sources of Strength of Egyptian Banks

Resilience of Egyptian Banks to the Global Recession

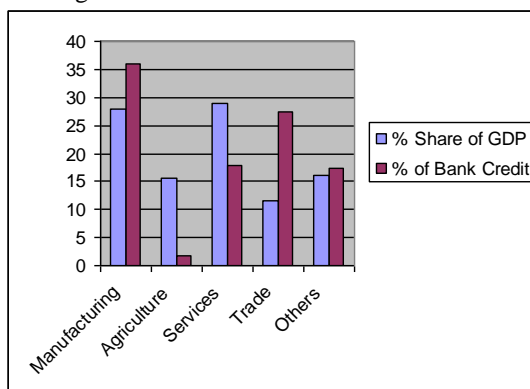
The first phase of the BRP has left Egyptian banks with better quality assets giving the banking sector substantial resilience to the global meltdown for several reasons. First, the issue of NPL had to be resolved. The exact bad debt portfolio is not explicitly published. However, the American Chamber of Commerce in Egypt estimated that the NPLs amounted to LE 40 billion (US\$7.2 billion) at the dawn of the banking reform in 2004. Bad debts owed by state-owned enterprises (SOEs) were swapped for 20-year floating rate government bonds cross guaranteed by the state-owned holding companies. As for bad debts owed by private individuals and businesses, an arbitration-based mechanism was established at the CBE to reach extra-judiciary settlements avoiding the lengthy and cumbersome process of court resolution. The settlements of arrears represented 46% with a total collection amounting to 12% of total NPLs. Second, since Egyptian banks do not hold risky assets, like derivatives and securitized bonds, they were saved from the world's financial turmoil. As per the orders of the CBE, there has been a reduction of 18.9% in the deposits held with foreign subsidiaries since the global recession sprang out (CBE 19).

Moreover, the CBE has prohibited Egyptian banks from placing amounts exceeding \$3 million with a sole foreign correspondent. A third source of strength is the ample liquidity characterizing the banking sector where

Egyptian banks hold 48.01% of their assets in liquid form in contrast to the credit crunch prevailing in USA. The reasons behind the high liquidity level are that the LRR in Egypt is among the highest in the world amounting to 14%. Second, banks preferred to remain risk averse by holding assets in the form of T-Bills. Third, M2 grew by a CAGR of 18.8% from 2004 to 2009. Also, foreign-exchange exposure is prudently supervised by the CBE limiting the open position of foreign currencies to a maximum of 20% of the bank's capital and only 10% for a single currency. This has sheltered Egyptian banks against the hefty foreign exchange fluctuations.

Changes in the Balance Sheets of Egyptian Banks Subsequent to the Global Crisis

A number of considerable alterations show on the balance sheets of Egyptian banks as a result of the global recession. The most significant consequence is a decline in credit facilities to the private sector from 58% of GDP in 2004 to 49.88% in August 2009, which is less than half the OECD average of 110%. This will affect the already wide saving-investment gap that currently runs at 10% due to the hemorrhage of funds from the Egyptian Stock Exchange. As for retail banking, foreign banks cut down on consumer loans as per directives from their head offices. But this business was captured by state banks that rapidly met the 30% unfulfilled demand in this sector. Yet, Figure (4) shows the imbalance in allocating funds to the growth-triggering sectors.



Source: Central Bank of Egypt. Annual Report. (several issues) and Ministry of Development, (several issues).

Figure 4. Comparison of Relative Share of GDP to Bank Credit per Sector (2004-2009)

While bank lending has declined, total customer deposits shot up from 100% of GDP in 2007/08 to 102% in 2008/09. The raison d'être behind this increase is that Egyptian savings held in Western banks sought the safe haven of the relatively more secure Egyptian banks. Besides, there was an overall reduction in the rate of dollarization from 23.2% in 2008 to 20.8% in 2009 due to the substantial interest rate differential between the US dollar and the Egyptian pound (AmCham 33). Another noteworthy change has been the reallocation of a

considerable volume of customer deposits from the private sector to state-owned banks. As displayed by Table (2), state-owned banks have been able to increase their market share at the expense of foreign private banks. However, public specialized banks have the smallest deposit base due to their goal of lending to the sectors of industry, agriculture and construction. These banks' branches are located in deprived villages contributing to SME growth.

Table 2. Market Share of Customer Deposits

	2004	2007	August 2009
Public Commercial Banks (a)	52	42	52
Public Specialized Banks (b)	6	6	5
Private Domestic Banks (c)	28	25	19
Private Foreign Banks (d)	14	27	24
TOTAL	100%	100%	100%

Source: Figures assembled and calculated from individual balance sheets of banks.

The Role of Egyptian Banks in Diminishing the Economic Turndown

After the successful completion of the first phase of the BRP, the banking sector has become the artery responsible for the mobilization of savings and their flow into investment. This paper will compare the financial efficiency of various categories of the Egyptian banking sector in bolstering the economy and absorbing some of the injuries caused by the Asian Crisis in 1997 and the global financial crisis. These consequences are measured in terms of economic growth, unemployment and inflation. Due to the novelty of the redesign of the Egyptian financial architecture, there is modest evidence endowing policy makers with the extent to which banks have attended to these tasks. The contribution of this research is to draw an empirical study analyzing the efficacy of various categories of Egyptian banks in cushioning the economy against the meltdown.

Literature Review

There is a large body of research findings showing that financial sector reforms are demonstrably linked to GDP growth as displayed by King and Levine (1993), Beck (2000), Ong (2003) and Ang (2009). Others provide empirical evidence that financial liberalization is generally associated with consistent GDP growth (Kaminsky and Schmukler 2003). Most of these studies are based on a combination of cross sectional and time series analysis. However, to deal with one country studies a number of panel data estimation methods were developed; for example Anderson and Hasio (1981) use an instrumental variable estimation, while Arrelano and Bond (1991) employ a generalized method of moments estimation. Conversely, a large volume of literature contradicts the above findings and proves the destabilizing effect of financial liberalization as it leads to an unduly large expansion of credit by the banking sector (Schneider and Tornell, 2004; Aghion, Bacchetta and Banerjee 2004). The debate seems to be balanced when the time horizon is taken into consideration. Loayza and Ranciere (2006) conclude that despite initial negative short term relationships, a positive association between liberalization and output growth exists in long-run.

Furthermore, the banking crisis literature finds that domestic credit is the best predictor of crises (Kaminsky and Reinhart 1999; Demirguc-Kunt and Degatriache 2000; Gourinchas et al. 2001). Yet, using proxies to measure banking and financial development remains to pose a challenge where the earlier employment of bank

credit/GDP (Cole, 1988) is considered as highly aggregated. Some research confines the prerequisites of a sound banking system to high profitability and adequate capital (Greuning et al. 2000). On the other hand, others provide evidence of the higher levels of efficiency associated with private ownership in banks. While there is abundant literature on the effect of bank ownership on efficiency, few studies focus on emerging economies (Hasan and Marton 2003; An, Bae, and Ratti 2007; Jeon and Miller 2005; and El-Shazly 2009).

Methodology

To measure the effect of bank efficiency on overall macroeconomic performance, this research employs the Fully Modified Ordinary Least Squares (FMOLS) approach suggested by Pedroni (2001). The legitimacy of using this method is the existence of a long run relationship among variables and that the regressors are strictly exogenous. Another merit is that, as opposed to the OLS estimator, it corrects for both serial correlation and potential endogeneity. The distinction between short run and long run causality is very important. As Darrat (1999) states, most of the benefits of financial development are realized in the short-run while in the long run these effects slowly disappear as the economy matures. A thriving literature has focused on the estimation of long-run relationships among variables of order one: I(1) (Phillips and Hansen 1990; Johansen 1998). Yet, this literature suffers from two misconceptions: long-run relationships exist only in the context of co-integration among integrated variables and standard methods of estimation are incorrect. Enders and Granger (1998) specify that standard tests of integration and co-integration have lower power in the presence of misspecified dynamics.

The Empirical Model

The macroeconomic meltdown is explained using an empirical model testing the effect of bank efficiency on 3 macroeconomic variables: GDP (Y), inflation (P) and unemployment (E). The 3 variables directly relate to the living standards of Egyptians and were the cause of immense sociopolitical turmoil in early 2008 prior to the outbreak of the recession. Three panel regressions are estimated according to the respective dependent variables (Y, P and E) facilitating the study of the effect of the type of ownership on the macroeconomic performance. The number of banks in the sample is 39. The financial aggregate position of Egyptian banks is obtained from the

database of the CBE, while macroeconomic variables are gathered from the publications of the CBE and the Central Agency for Public Mobilization and Statistics.

Individual annual financials were collected from each of the 39 banks currently operating in Egypt. In case of M&As and takeovers, financial values were combined.

$$Y_t = c_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \alpha O_i S_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \beta O_i Q_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \gamma O_i B_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \delta O_i D_t + \sum_{t=1992}^{2009} C_t + \varepsilon \quad (1)$$

$$P_t = c_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \alpha O_i S_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \beta O_i Q_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \gamma O_i B_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \delta O_i D_t + \sum_{t=1992}^{2009} C_t + \varepsilon \quad (2)$$

$$E_t = c_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \alpha O_i S_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \beta O_i Q_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \gamma O_i B_t + \sum_{i=a}^d \sum_{t=1992}^{2009} \delta O_i D_t + \sum_{t=1992}^{2009} C_t + \varepsilon \quad (3)$$

where, O: type of ownership (public/commercial, public/specialized, private domestic, foreign)

S: volume of savings measured by log customer deposits mobilised

Q: log loans to selective sectors triggering economic growth

B: a set of banking indicators (capital adequacy as per the requirements of the Basel Accord II; non-performing loans/total loans; ROA; deposit/loan ratio; liquid assets/total assets)

D: (log direct loans to the Ministry of Finance + T-securities)

C: a set of control variables (the initial level of GDP, gross fixed capital, government expenditure, the volume of trade and the inflation rate)

ε : exogenous shocks including log sums spent + liquidity pumped by the CBE

$\alpha, \beta, \gamma, \delta$: the short-run coefficients related to the determinants of X

subscripts i and t : type of bank (i = Public Commercial a, Public Specialized b, Private Domestic c & Foreign d) and year (t = 1992 - 2009)

Data Testing

Prior to applying the co-integration technique, the first step is to investigate the stationarity properties of the variables. The power of standard unit root tests may be quite low given the sample sizes and time spans. Performing unit root tests ensures that bias is totally eliminated. The Augmented Dickey-Fuller (ADF), the Phillips-Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests are employed to assess the level of integration of the variables. Results of the unit root tests are shown in Table (3). All three tests confirm that the entire variables are of order one when tested at the 5 percent significance levels.

Table 3. Unit Root Tests*

Variables		ADF Test Statistic	PP Test Statistic	KPSS	Conclusion
S	Level	-1.88 (1)	-1.78	0.59	I(1)
	First difference	-5.78 (0)	-2.31	0.25	
Q	Level	-3.05 (1)	-2.42	0.66	I(1)
	First difference	-3.19 (1)	-8.06	0.34	
B	Level	-1.39 (1)	-1.46	0.14	I(1)
	First difference	-5.45 (0)	-0.91	0.19	
D	Level	-2.64 (0)	3.07	0.66	I(1)
	First difference	-19.57(1)	17.03	0.31	
C	Level	-1.19 (1)	-1.46	0.33	I(1)
	First difference	-9.45 (1)	-2.97	0.19	

*The lag lengths for the ADF test are shown in parentheses and are determined using Schwartz Bayesian Criterion.

The second step is to test for the existence of a long-run relationship between macroeconomic performance and banking efficiency. This study employs the Pedroni panel co-integration to examine the long-run relationship. Lastly, on finding co-integration the fully modified ordinary least squares (FMOLS) method is used to estimate the coefficients on economic growth. Pedroni (2000) uses seven test statistics for testing panel data co-

integration. The first four statistics are called panel co-integration statistics and are pooled “within-dimension” based statistics, while the other three are called group-mean panel co-integration statistics since they are “between-dimension” panel statistics. These different statistics are based on a model that assumes that co-integration relationships are heterogeneous between individual members and are reported in Table (4).

Table 4. Pedroni Panel and Group Co-integration Statistics: Testing Equations (1), (2) & (3)

	GDP growth (Y)	Employment (E)	CPI (P)
Panel co-integration statistics			
Panel ν -statistic	20.547* (0.0000)	13.057(0.0000)	18.041(0.0000)
Panel ρ -statistic	3.142(0.0021)	2.891** (0.0091)	2.149 (0.0089)
Panel pp-statistic	1.897(0.0190)	1.459* (0.0090)	1.785 (0.0078)
Panel ADF-statistic	-1.348 (0.1289)	-1.986 (0.0891)	-1.0781** (0.3856)
Group co-integration statistics			
Group ρ -statistic	3.843(0.0002)	3.459(0.0009)	3.324(0.0005)
Group-pp-statistic	4.459(0.0034)	4.671* (0.0000)	4.126(0.0018)
Group-ADF statistic	3.145(0.0039)	1.11(0.0012)	2.231* (0.0001)

- Parentheses contain the probability values
- * & ** show statistical significance at 5% and 10% respectively

The results show that the null hypothesis of no co-integration is robustly rejected pointing to the existence of a long run relationship between macroeconomic performances on the one hand, and banking efficiency on the other hand. The next step is the estimation of long term relationships.

The FMOLS Panel Study

The ensuing task is to look into the long term relationship comparing the Economic Reform and Structural Adjustment Program (ERSAP) that Egypt embarked on

from 1991 till 2003 to the BRP (2004-2009). Given that the variables are co-integrated, the long run relationship has to be estimated. The following is the general regression model encompassing the regression models in equations (1) through (3). The three macroeconomic dependent variables are defined as “X” which comprises of GDP level (Y), inflation rate (P) and the unemployment level (E), as follows: $[X = \{Y, P, E\}]$. The long-run growth regression serves as a forcing equilibrium condition.

$$X = \alpha_0 + \sum_{i=a}^d \alpha_i O_i S_t + \sum_{i=a}^d \beta_i O_i Q_t + \sum_{i=a}^d \gamma_i O_i B_t + \sum_{i=a}^d \delta_i O_i D_t + \sum_{t=1992}^{2009} \epsilon_t + \theta [X_{t-1} - \{\mu_0 + \mu_1 (X_{t-1})\}] + \epsilon_t \quad (4)$$

where, μ : the long-run coefficients

θ : the speed of adjustment to the long-run relationship

ϵ : a time-varying disturbance

The results of the panel are reported in Table (5). To allow for comparisons, the period is divided into two phases: 1992-2003 and 2004-2009. This is to segregate and compare the results prior to the BRP and after the reform. Moreover, the results are separately reported for each type of banks to allow for comparisons for different bank categories.

Table 5. Panel FMOLS Results

	GDP growth (Y)		Employment (E)		CPI (P)	
	1992-03	2004-09	1992-03	2004-09	1992-03	2004-09
State-owned Commercial Banks (a)						
<i>Savings</i>	105.79** [7.58]	298.79* [6.98]	122.98* [38.40]	126.98* [42.898]	4.85* [1.45]	2.75* [3.35]
<i>Loan Quality</i>	18.40* [10.72]	53.04 [9.22]*	0.92* [8.52]	0.50 [2.25]	2.15* [2.15]	1.09* [18.49]
<i>Banking Efficiency</i>	2.65* [16.38]	18.83* [12.32]	0.19 [17.88]	0.36 [14.02]	0.29* [11.34]	0.12* [9.59]
<i>Financing Public Debt</i>	74.76* [236.73]	138.14* [138.72]	22.17* [23.13]	83.66* [45.73]	0.09* [15.33]	0.89* [12.25]
State-owned Specialized Banks (b)						
<i>Savings</i>	13.02** [32.06]	13.00* [31.62]	107.11** [1.92]	114.87* [41.13]	1.05* [0.45]	0.21* [0.41]
<i>Loan Quality</i>	114.13 [35.65]*	131.43 [29.35]*	0.88* [7.23]	0.43 [6.95]	8.45* [5.25]	1.33* [3.12]

<i>Banking Efficiency</i>	5.90* [13.02]	15.15* [12.75]	0.39 [87.75]	0.56 [24.32]	0.11* [7.09]	1.05* [7.12]
<i>Financing Public Debt</i>	14.13* [13.39]	55.44* [49.96]	2.99 [8.79]	13.81 [9.23]	0.01 [5.23]	0.05 [4.69]
Private Commercial Banks (c)						
<i>Savings</i>	98.40* [10.72]	117.40* [9.61]	20.08* [18.04]	22.17** [8.67]	3.53 [1.05]	0.27 [0.91]
<i>Loan Quality</i>	79.80 [50.18]*	49.18 [45.88]*	0.16* [6.01]	0.05* [2.34]	0.01* [3.12]	0.12* [5.19]
<i>Banking Efficiency</i>	53.19* [2.91]	76.17* [8.11]	2.21 [19.19]	3.19 [18.22]	6.29* [13.39]	8.96* [9.12]
<i>Financing Public Debt</i>	8.67* [8.26]	18.44* [13.06]	2.45* [16.45]	12.29* [26.13]	0.11 [8.79]	0.19 [9.17]
Foreign Banks (d)						
<i>Savings</i>	33.02* [35.60]	-21.92* [25.98]	17.19* [8.46]	9.91* [8.40]	1.45 [1.33]	0.05 [1.67]
<i>Loan Quality</i>	22.98** [52.34]	29.78 [59.15]*	0.11* [6.05]	0.04* [2.22]	0.84* [15.33]	1.88* [23.37]
<i>Banking Efficiency</i>	51.69* [8.43]	53.91* [2.41]	2.65* [4.18]	2.88* [3.34]	3.69* [11.19]	6.15* [55.56]
<i>Financing Public Debt</i>	5.07** [8.26]	4.33* [6.06]	0.19 [37.65]	0.23 [31.44]	0.03 [3.74]	0.08 [4.14]

- Parentheses contain the t-statistics
- * & ** show statistical significance at 5% and 10% respectively

Interpretation of the Results

The results of the empirical study contend that the type of bank ownership has a substantial impact on macroeconomic performance in Egypt. There is no stereotypical explanation of the results pertaining to all macroeconomic dependent variables and the following sections detail the findings. In general, the results are consistent with earlier studies, where higher savings, measured in this case by customer deposits, lead to elevated GDP growth and more job creation. However, there is no evident effect on the price level.

The Impact of Customer Deposit Mobilization

Savings is measured by the volume of customer deposits. Contributions of the ownership effect on savings mobilization are highest for domestic public commercial banks and private banks. The impact of the BRP is evident on savings, which explains the success of this reform agenda in establishing more trust in the banking sector, hence attracting more savings. However, the effect was lower on foreign banks and the logical explanation is that in the absence of explicit deposit insurance schemes, and especially in the midst of the global financial crisis, depositors preferred to place their funds with domestic banks, especially public banks to maximize the safety of their funds. As for state-owned specialized banks, only one bank is successful in attracting customer deposits, while all others access funds from their mother ministries. More jobs were created due to higher savings after the banking reform of 2004 and both categories of state banks took precedence over private banks that did not serve this goal to the fullest. With regards to the price level, various categories of banks have similar effect.

Hence, generally speaking, with regards to savings mobilization, state banks have the largest impact and were able to act as the providers of implicit deposit insurance as is expected. Perhaps the reason for that lies in the fact that Bank Misr, the largest state bank, has always assumed the responsibility of bailing out smaller banks and providing preferential saving schemes for depositors.

The Impact of Loan Quality and Distribution

As recorded earlier by Figure (5), the aggregate banks' lending procedure displays that there is a serious mismatch between actual loan allocation and the need to direct loans to the sectors that trigger economic growth most. The results show that both commercial state and foreign banks are to be blamed for this. However, state specialized banks as well as domestic commercial banks properly allocate funds to the sectors that best trigger economic growth. These same categories are also the highest contributors to job creation. The impact on inflation is not substantial for any category of banks, albeit for specialized banks during the first reform phase. This is due to the fact that prior to the BRP they used to charge excessively high interest rates raising the costs for borrowers. In general, the results show substantial improvement after the BRP.

The Impact of Banking Efficiency and Performance

On the whole, private banks, both local and foreign, have higher efficiency ratios. There is no doubt that the justification is the increasing profit motive as compared to a relatively soft budget constraint enjoyed by state-owned banks. However, domestic private banks show

higher efficiency compared to foreign banks. This is an alarming outcome that has to be further investigated. The difference in performance is caused by lower levels of ROA, less liquid assets and lower loan-deposit ratios maintained by foreign banks. As for other measurements of capital adequacy, NPLs and ROA both types of privately-owned banks seem to fare equally well. Thus, regarding bank efficiency, private banks have a stronger impact on the economy. In actual fact, it is this very outcome that has triggered the propensity for privatization of state-owned banks.

Again, it is obvious that the outcome of the BRP vividly shows positive impact on the banking industry. In spite of the global meltdown, banking efficiency has substantially improved. Yet, the caveat is that the fiscal and monetary stimuli could have contributed to the improvement. However, these would not directly reflect on banking efficiency since the CBE has not engaged in loaning funds to banks or to introduce bailout plans. Hence, it may be safely concluded that banking efficiency has been attained after the establishment of a whole new set of performance criteria and consequent to strict prudential controls by the central bank.

The Impact of Financing Public Debt

In the midst of the recession, especially with the need to finance the fiscal stimulus package, there was dire need for extra sources of revenue. Not all categories of Egyptian banks played an equal role in this case. It is observed that T-Bill portfolios of the state commercial and private domestic banks have a positive impact on GDP growth and employment especially after the BRP. Domestic private banks have a lower impact, but it has improved after the reform. Conversely, the contribution of foreign banks has decreased after the BRP. This elicits puzzlement since it is expected that most banks should resort to holding this type of asset especially after the crisis. The cause is that foreign banks pumped liquidity to their foreign subsidiaries, while the public specialized banks liquidated their portfolios in order to extend more loans to SMEs. The impact on inflation is insignificant in all cases.

Conclusion and Policy Recommendations

This paper analyzed the restructuring of the Egyptian banking sector from the liberalization in 1991-2003 to the end of the first phase of the Bank Reform Plan (2004-2009). Both the descriptive analysis of the consolidated balance sheet of Egyptian banks and the econometric model showed that, at the aggregate level, the first liberalization phase did not adequately shield banks against both internal and external shocks. In contrast, the BRP left banks reasonably immune to the blow of the global financial crisis since it had a favorable impact on the earnings and overall efficiency of the banking sector. In true fact, the BRP that was implemented immediately after the 2003 banking crisis has eliminated uncertainty and established more trust in the economic environment, hence mobilizing savings and putting an end to the hemorrhage of funds out of the banking system.

Conditions may have been detrimental had the capital flight not been reversed in the course of the BRP. The panel regression results also reveal that Egyptian banks have restructured their asset management and consolidated their activities. These positive results are with the caveat that in spite of the overall positive expectations, the share of loans in GDP did not increase during the banking reform due to credit risk and uncertainty.

In terms of bank ownership, private domestic and foreign banks seem to do better than state and private banks in regards the banking efficiency performance measures, and their contribution to macroeconomic performance has substantially improved after the implementation of the BRP. The most disturbing finding that requires closer examination is that in spite of their immense ability to mobilize savings, state-owned banks were incapable of fully utilizing this to decisively create jobs. This is perhaps attributed to the fact that the bulk of loans of these banks are extended to public firms or consumer loans. This calls for the efforts of the central bank to give incentives to these banks to loan out to job-generating industries through exemptions from reserve requirements.

Conversely whilst state banks proved to be the best at attracting customer deposits, albeit not utilizing them to create jobs, the serious problem with foreign banks is their minimal ability to mobilize savings. The reason is that foreign banks remain small in size compared to all other three categories, which prevents them from capturing the economies of scale. Moreover, the smaller number of branches and their near nonexistence in rural Egypt diminishes their role in mobilizing savings. Hence, the increasing interest of foreign investors in the Egyptian banking sector has to be coupled with expansions, mergers or the acquisition of smaller sized banks that enjoy the privilege of a wide branch network.

All of these odd findings corroborate that the second banking reform efforts (BRP) has proved more successful on all fronts compared to the earlier liberalization phase. However, a few reforms need to be introduced whilst the second phase of the BRP is in its early stages. First and foremost, the CBE needs to introduce explicit insurance schemes, which are apt to attract more savings to private banks. There is no doubt that the existence of competition in the financial sector creates additional spillover effects, which greatly increase the potential macroeconomic gains leading to sustainable economic growth, higher employment and decreased inflation which necessitates the efficient allocation of resources by the banking sector. In this respect, the CBE has to raise capital adequacy requirements to ensure that foreign banks do not peril to fail. Another recommendation revealed by the results of this study is the need for the Central Bank of Egypt to give incentives to the banking sector to direct loans to the service and agricultural sectors, the two sectors that are mostly deprived from credit facilities, albeit contributing substantially to GDP. This can be done following the previous tradition of exempting the equivalent amounts of customer deposits from the exceedingly costly LRR of 14%. Also, the CBE has to pay more attention to helping

banks to minimize credit risk since this is the main reason for the low loan-deposit ratio in Egyptian banks that deprives the economy of employment opportunities. The bad debt portfolio has to be gradually deducted from balance sheets and more training is to be offered through the commendable Banking Academy recently established in the CBE in order to avoid future relapses. Perhaps, it is most advisable to integrate these three suggestions within the road map and the specifications of the second phase of the BRP that will be instigated in 2010. Finally, it should be noted that this research opens the door for further future studies that examine the effect of political factors on the performance of Egyptian banks.

References

1. Aghion P, Bacchetta P, Banerjee A (2004) Financial development and the instability of open economies. *Journal Mon Econ* 51: 1077–1106.
2. American Chamber of Commerce (2008) *Emerging Egypt, 2008*. Cairo: Business Studies and Analysis Center, American Chamber of Commerce in Egypt.
3. An J, Bae S, Ratti R (2007) Political influence and the banking sector: evidence from Korea. *Ox Bull Econ and Stat* 69 1: 75-98.
4. Anderson TW, Hsiao C (1981) Estimation of dynamic models with error components. *J of Am Stat Assoc* 76: 598-606.
5. Ang J (2009) *Financial development and economic growth in Malaysia*. New York: Routledge.
6. Arellano M, Bond S (1991) Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Rev of Econ St* 58: 227-297.
8. Assaad R (2007) Unemployment and youth insertion in the labor market in Egypt. Working Paper 118, The Egyptian Center for Economic Studies, Cairo, Egypt.
9. Beck T, Demirguc-Kunt A, Levine R (2000) A new database on financial development and structure. *Wd Bk Econ Rev* 14: 597–605.
10. Berger A, Hannan T (1998) The price concentration relationship banking *Rev of Econ and Stat*, 71: 291-299.
11. Breitung J. (2000) The local power of some unit root tests for panel data in nonstationary panels, panel cointegration, and dynamic panels. *Adv in Econometrics*, Baltagi B ed., 15, JAI: Amsterdam: 161-178.
12. Central Agency for Public Mobilization and Statistics (2009) Annual Report.
13. Central Bank of Egypt (2009) Economic Review: 2008/2009. 49(3).
14. Central Bank of Egypt (2009) Monthly Statistical Bulletin, (September).
15. Cole RA (1998) The importance of relationships to the availability of credit. *J of Bank and Finc* 22: 959-77.
16. Darrat A (1999) Are financial deepening and economic growth causally related? Another look at the evidence. *Int Econ J* 13: 19–35.
17. Demirguc-Kunt A, Detregiache G. (2000) Banking sector fragility: A multivariate Logit approach" *World Bk Econ Rev* 14: 287–307.
18. Economist Intelligence Unit (2009) Country Report: Egypt. (March).
19. El-Shazly A (2009) Efficiency measures for banking groups in Egypt. Working Paper 148, The Egyptian Center for Economic Studies, Cairo, Egypt.
20. Enders W, Granger C (1998) Unit root tests and asymmetric adjustment with an example using the term structure of interest rates. *J of Bus of Econ and Stat* 16: 304– 312.
21. Global Investment House (2008) *Egypt economic review: surviving the financial turmoil*.
22. Gourinchas P, Landerretche O, Valde´s R. (2001) Lending booms: Latin America and the world *Economia* 1: 47–100.
23. Greuning V et al (2000) *Analyzing banking risk: a framework for assessing corporate governance and financial risk management*. Tokyo: Springer-Verlag Tokyo.
24. Hasan I, and Marton K (2003) Development and efficiency of the banking sector in a transitional economy: Hungarian experience. *J of Bnk and Finc*, 27(2): 2249-2271.
26. Jeon Y, Miller S (2005) Performance of domestic and foreign banks: the case of Korea and the Asian financial crisis. *Gl Econ Rev*. 34 (2): 145-165.
27. Kaminsky G, Reinhart C (1999) The twin crises: the causes of banking and balance of payments problems. *Am Econ Rev*. 89: 473–500.
28. Kaminsky G, Schmukler S (2003) Short-run pain, long run gain: the effects of financial liberalization IMF Working Paper.
29. Korayem K (1997) Egypt's economic reform and structural adjustment program. Working Paper 19, The Egyptian Center for Economic Studies, Cairo, Egypt.
30. King R, Levine R (1993) Finance and growth: Schumpeter might be right. *Q J of Econ*, 153: 717–738.
31. Loayza N, Ranciere, R (2004) Financial development, financial fragility and growth. *J of mon, Cr and bnk*, 38 (4).
32. Macro Fiscal Policy Unit Ministry of Finance, Egypt (2009) *Egypt Response to the global crises*.
33. Ong H et al (2003) Evaluating a credit guarantee agency in a developing economy: a non-parametric approach. *Int J of Soc Econ*, 30 (1/2): 143 – 152.
34. Pedroni P (2001) Fully modified OLS for heterogeneous cointegrated panels. *Adv in Economet*, 15: 93-130.
35. Phillips P, Hansen BE (1990) Statistical inference in individual variables regression with I(1) process *Rev of Econ St*, 57: 99–125.
37. SCA: Suez Canal Authority (2009) Monthly Report: Traffic Statistics.
38. Schneider M, Tornell A (2004) Balance sheet effects, bailout guarantees and financial crises. *Rev of Econ St*, 71 (3).