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THE IMPACT OF CAPITAL REQUIREMENTS ON BANKS' COST OF INTERMEDIATION AND PERFORMANCE: THE CASE OF EGYPT

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Abstract

In 1991, the Central Bank of Egypt increased the minimum capital requirements for the banking industry vis-à-vis risk-weighted assets to 8 percent, along the lines proposed by the Basel Committee on Banking Supervision. In this paper, we investigate the effects of capital regulations on cost of intermediation and profitability. Higher capital adequacy increases the interest of shareholders in managing banks' portfolios. The result is a higher cost of intermediation and profitability. A number of factors have increased the cost of intermediation in the post-capital regulation period: higher capital-to assets ratios, an increase in management efficiency, an improvement of liquidity and a reduction in inflation. The reduction in output growth countered these effects. In the meantime a number of factors contributed positively to banks' profitability in the post-regulation period: higher capital requirements, the reduction in implicit cost and the increase in management efficiency. The reduction in economic activity had opposite effects on banks' profitability. Overall, the results support the Central Bank's efforts to enforce capital regulations to improve the performance of the banking sector in Egypt.

ملخص

في عام 1991، رفع البنك المركزي المصري الحد الأدنى لمتطلبات رأس المال إلى 8% بالنسبة للقطاع المصرفي نظير الأصول المحملة بالمخاطر تماشيا مع الخطوط التي اقترحتها لجنة بازل للرقابة المصرفية. ونبحث في هذه الورقة تأثيرات ضوابط رأس المال على تكلفة الوساطة والربحية. ويؤدي ارتفاع كفاية رأس المال إلى زيادة اهتمام المساهمين بإدارة محافظ البنوك، ويؤدي هذا أيضا إلى زيادة الوساطة والربحية. وقد رفعت عدة عوامل تكلفة الوساطة خلال فترة ما بعد ضوابط رأس المال مثل رفع نسب الأصول إلى رأس المال وزيادة كفاءة الإدارة وتحسن السيولة وانخفاض التضخم. وواجه هذه التأثيرات في المقابل انخفاض في نمو الإنتاج. كما أسهمت عدة عوامل بشكل إيجابي في ربحية البنوك خلال فترة ما بعد تطبيق الضوابط مثل متطلبات أعلى لرأس المال وانخفاض في التكلفة الضمنية وزيادة كفاءة الإدارة. وكان لانخفاض النشاط الاقتصادي أثاره المضادة على ربحية البنوك. وعموما، نجد أن هذه النتائج تدعم جهود البنك المركزي لتعزيز ضوابط رأس المال لتحسين أداء القطاع المصرفي في مصر.

1. Introduction

Recent economic crises have revealed the importance of bank regulations to hedge against the high risk attributed to imbalances in banks' balance sheets. Nonetheless, excessive regulations may have adverse effects. On the one hand, they serve as prudential measures that mitigate the effects of economic crises on the stability of the banking system and subsequent accompanying macroeconomic results. On the other hand, excessive regulations may increase the cost of intermediation and reduce the profitability of the banking industry. Simultaneously, as banks become more constrained, their ability to expand credit and contribute to economic growth will be hampered during normal times.

While most analysts would argue for the need to enforce regulations, the question is what would be the right benchmark to enforce regulations without jeopardizing the ability of banks to service the economy? To properly address this question, it has become necessary to thoroughly analyze the effect of capital regulations, namely the capital adequacy ratio.

The literature on this subject is growing. Nonetheless, its scope has been limited by data availability and methodological issues. Before embarking on our proposed research, we review the existing literature to identify the contribution of this paper's analysis. For more details, see VanHoose (2006), Athanasoglou, Brissimis and Delis (2005), and Jackson et al. (1999).

The research undertaken to analyze the effects of capital regulations on banks' performance has focused on the analysis of either cross-country or individual countries' banking systems. The first group of studies includes that of Demirguc-Kunt and Huizinga (1998). They analyze data for 80 countries during the 1988-95 period to study the determinants of interest margin and profitability. Chiuri, Ferri, and Majnoni (2002) examine a panel of data for 572 banks in 15 developing countries. They find consistent evidence – after seeking to control for banking crises – that the imposition of capital regulation induces a reduction in loan supply and hence, in total lending in these countries. The study by Demirguc-Kunt, Laeven, and Levine (2003) analyzes the impact of bank regulations as well as other internal determinants, which include concentration, and institutions, on bank profit margins. The study analyzes the impact of bank regulations, concentration, and institutions using bank- level data across 72 countries while controlling for a wide array of macroeconomic, financial, and bank-specific traits. Doliente (2003) investigates the determinants of net interest margins of banks in four Southeast Asian countries. Net interest margins are partially explained by bank-specific factors, namely operating expenses, capital loan quality, collateral and liquid assets. Barth, Caprio, and Levine (2004) use a new data base on bank regulations and supervision in 107 countries to assess the relationship between specific regulatory and supervisory practices and banking-sector development, efficiency and fragility. The results raise a cautionary flag regarding government policies that rely excessively on direct government supervision and regulation of bank activities.

Single country studies, such as Furlong (1992), and Haubrich and Wachtel (1999), conclude that capital regulations in the U.S. contribute to a decrease in lending that helps fuel a post-capital requirements credit crunch. Berger and Udell (1994) examine whether the risk-based capital requirements put into place in the late 1980s contributed to the so-called "credit crunch" that occurred in the United States in the early 1990s. They find evidence that other sources of loan supply reduction or declines in loan demand in the early 1990s played a much more prominent role in reducing bank lending. In contrast, Peek and Rosengren (1995 a,b) conclude that there is considerable evidence, at least for New England, that both lower loan demand and a capital-crunch-induced decline in loan supply *together* brought about a decline in lending. Brinkmann and Horvitz (1995) also find evidence of significant loan supply responses to the Basel I capital requirements. Wagster (1999) reaches the same conclusion for

Canada and the U.K. He fails to find support, however, for this result in the cases of Germany, Japan, and the U.S. where he concludes that a number of factors play a role in generating a credit crunch.

Benh-Khedhiri, Casu, and Sheik-Rahim (2005) study profitability and interest rates' differentials in Tunisian banking. More specifically, they focus on the determinants of banks' net interest margins as indicators of the sector's efficiency. Using data for Taiwan Province of China, Lin, Penm, Garg, and Chang (2005) study the direct effects of capital regulations and capital requirements. More specifically, they study three areas: (i) the relation between capital adequacy and the bank insolvency risk index, (ii) the relation between capital adequacy and financial performance, and (iii) the interaction and relationship between the insolvency risk of banks and financial performance.

Not all researchers agree that capital regulation has had significant effects on bank lending. Jackson et al. (1999) review a number of prior studies investigating how capital adequacy regulations influence actual capital ratios; such as Peltzman (1970), Mingo (1975), Dietrich and James (1983), Shrieves and Dahl (1992), Keeley (1990), Jacques and Nigro (1997), Aggarwal and Jacques (1997), Hancock and Wilcox (1994), Rime (2001) and Wall and Peterson (1987, 1995). Jackson et al. concludes that in the near term banks mainly respond to strict capital requirements by reducing lending and that there is little conclusive evidence that capital regulation has induced banks to maintain higher capital to assets ratios than they otherwise would choose if unregulated.

To sum, since its introduction, the Capital Accord has sparked a debate on the value of its implementation. On the other hand, it has been acknowledged for its contribution to the widespread use of risk-based capital ratios. The Accord has also been praised for the international coverage of capital standards and for the improvement of these standards in many countries. Its design, however, has been blamed for several distortions to the business of banking. Growing evidence on these distortions and a reduction in its effectiveness has led to proposals to redesign it.

There is no consensus on how best to design the regulation of bank capital, Santos (2002). Restricting bank activities through a higher capital requirements ratio could be negatively associated with bank development, adversely affecting credit expansion and credit growth. Moreover, regulatory restrictions on bank activities may increase net interest margins or overhead costs. The ability of banks to stabilize income flows by diversifying activities may only work in countries with sufficient securities market development.

Earlier studies on the subject employed a static estimation approach which does not account for persistence in the dependent variable and the endogeneity of explanatory variables, including capital adequacy. To address these shortcomings, recent studies have followed a dynamic estimation approach. Athanasoglou, Brissimis, and Delis (2005) investigate, in a single-equation framework, the effect of bank-specific, industry-specific and macroeconomic determinants on bank profitability. Using dynamic estimation technique, Goddard, Molyneux, and Wilson (2004) study the determinants of profitability of European banks. They find a significant persistence of abnormal profits from year to year and a positive relationship between the capital-asset ratio and profitability.

Another strand of the literature relates capital ratios to bank profit efficiency, as measured by frontier techniques. Examples are Kwon and Eisenbeis (1997), Fare et al. (2004), and Berger and Bonaccarsi di Patti (2006). Higher leverage or a low equity/asset ratio reduces the agency costs of outside equity and increases its value by constraining or encouraging managers to act more in the interest of shareholders. Hence, higher leverage can mitigate conflicts between shareholders and managers concerning the choice of investment. Along these lines, the

studies by Besanko and Kanata (1996), Blum (1999), and Calen and Rob (1999) examine the impact of capital regulations on risk taking and bank's performance.

The theoretical motivation for the paper's analysis is firmly rooted in the industrial organization literature on bank structure and efficiency. The three seminal analyses of the portfolio impacts of binding capital requirements are the contributions of Kahane (1977), Koehn and Santomero (1980), and Kim and Santomero (1988). A representative bank takes asset prices and yields as given and determines its optimal portfolio with an aim to maximize the expected utility derived from end-of-period capital, which in turn depends on the degree of the bank's risk aversion. A tightening of the required leverage ratio constrains the bank's efficient asset investment frontier, forcing a response to alter the mix of assets in portfolio. A non-risk averse will respond by choosing a riskier asset mix. The effect of capital requirements on the overall banking system depends on the distribution of risk aversion across banks.

An interesting examination of how capital requirements alter the incentives that banks face is contained in Demirguc-Kunt and Huizinga (1999). An increase in capital requirements pushes banks to substitute equity for deposit financing, cutting into shareholder's surplus. The reduction in surpluses increases the probability of loss, forcing a rise in the cost of intermediation to maintain profitability. In support of this hypothesis is the empirical evidence showing a significant impact on interest margins in response to higher capital holdings and the share of total assets held by banks. The evidence also supports higher net interest margins and more profitability for well capitalized banks. This is consistent with the fact that banks with higher capital ratios have a lower cost of funding because of lower prospective bankruptcy costs.

Our paper focuses on the impact of capital regulation on the performance of the banking industry in Egypt. A variety of factors underlies the contribution of our research to existing literature. First, our study is the first for Middle East and North Africa (MENA) countries that analyzes the effects of capital regulation on banks' performance. Second, the dearth of banking data has limited the analysis in previous studies to seven years at the most. We have identified new data sources from the Bank Scope data base and included 16 years of data in the current study. The longer sample period provides the necessary time frame for a thorough analysis of the impact of capital regulation by identifying structural breaks, compared with the pre-regulation period. Third, our study provides a comprehensive framework to explicitly assess the effects of capital adequacy on two specific measures of banks' performance: cost of intermediation and profitability. Fourth, our estimation technique utilizes recent innovations in panel estimation that incorporates dynamics to take into consideration persistence in the behavior of dependent variables over time. Fifth, our study accounts for a variety of macroeconomic variables, including cyclical output fluctuations. Egypt has undergone major structural and policy changes recently. Our investigation sheds light on the importance of the macro environment to the performance and stability of the banking industry in Egypt. The combined evidence provides a menu of important determinants of bank's performance to guide policymakers towards upgrading quality and enhancing the stability of an industry that is considered by many to be the core of economic development.

2. Institutional Background

Our investigation will focus on the analysis of the impact of capital regulation on banks' performance in Egypt using two measures of performance: cost of intermediation and profits. To motivate the investigation, we review the institutional background.

The Egyptian banking sector expanded markedly in the mid-1970s (for details, see El-Shazly (2006)), spurred by the shift in economic management towards an open-door policy. This

policy aimed at outward-looking growth with an active role for the private sector in economic management. To achieve these objectives, a banking law was enacted in 1975 (Law 120/1975) defining the nature and mode of operations for all banks. In the 1990s, the Egyptian authorities undertook major banking reforms towards a more liberal system. This included the strengthening of bank supervision and regulations on the basis of internationally accepted standards to deal with the risk inherent in the new policy environment. As the banking sector is a major component of the Egyptian financial sector, the Central Bank of Egypt (CBE) viewed the soundness of such sector to be of a paramount importance to ensure full utilization of the sector's resources towards reviving economic activity and sustaining high level growth.

The Egyptian banking sector comprises 57 banks, 28 commercial banks of which 4 banks are state-owned, 26 investment banks of which 11 joint venture banks and 15 branches of foreign banks, in addition to 3 specialized banks of which two are state-owned. The number of licensed branches of these banks in Egypt reached 2443.

All specialized banks are state-owned and are assigned the task of providing long-term finance for real estate, agricultural and industrial development. There are also public sector commercial banks whose volume of business constitutes a significant share in total bank transactions (nearly 50 percent). Private and joint ventures, as well as foreign banks, (operating through branches) are private sector institutions. The role of foreign banks is to raise long-term funds on the international financial market and promote investment.

The banking industry in Egypt is, therefore, concentrated and segmented, which weakens competition. The rapid growth of the banking sector during the 1990s, together with the liberalization of the whole economy added extra burden on the Central Bank of Egypt as the sole regulator of the banking industry. Recently, in an attempt to reduce market concentration and enhance competition, the authorities have implemented a bank privatization program. Public banks are mandated to divest their shares in the joint venture banks with a maximum ownership of 20 percent.

Banks are supervised by the Banking Control Department of the CBE and, in practice, supervision is strong. The CBE has made considerable progress in developing its supervisory framework and staff using materials, procedures, and techniques obtained from other countries' supervisory systems. According to the FSAP report of 2002,[1] the CBE complied with most of the Basel Core Principles for Effective Banking Supervision. To reinforce the supervisory role, the Government, together with CBE, has drafted a new Central Bank and Banking Sector Law to increase the degree of independence of the CBE in maintaining price stability.

Since the end of the first FSAP in June 2002, a number of legislations targeted additional reform. A new law was enacted in July 2003 to establish the independence of the CBE. In line with the recommendations of the FSAP report, modifications and amendments of the CBE prudent rules and regulations have been introduced. All banking supervision arrangements have been comprehensively documented in the second half of 2202. New regulations regarding connected and related party lending have been enforced since November 2002. By the end of March 2003, the majority of banks complied with the new minimum capital adequacy ratio of 10 percent and an additional capital injection to all state-owned banks has been implemented. Provisioning levels for classified loans are monitored very closely. Other supervision and prudential regulations include: increasing the minimum paid-up capital of banks, increasing efficiency of the off-sight supervision of the CBE Supervision Department and preparing banks for the introduction of the II new regulations.

[1] IMF, FSAP main report, December 2002.

Our research focuses on the impact of capital requirements, using the Bank for International Settlements (BIS) standards of the Basel Accords, on performance of Egyptian banks. The main regulatory reforms are introduced and implemented by the Central Bank of Egypt. Prior to reforms in the early 1990s, the banking sector was heavily regulated through credit controls and portfolio restrictions. In 1991, the Central Bank of Egypt increased the minimum capital requirements vis-à-vis their risk-weighted assets to 8 percent, along the lines proposed by the Basel Committee on Banking Supervision. Capital was defined to consist of two components: primary capital (paid-up capital and reserves) and other capital (provisions for general banking risks and subordinated long-term loans of at least five-year maturity). As a general rule, one-half of the capital adequacy ratio would be met from primary capital. Capital requirements force banks to have more of their own capital at risk, so that they internalize the inefficiency of gambling or investing in high-risk assets. However, they also reduce banks' franchise values (meaning the capitalized value of expected future profits).

Murinde and Yaseen (2006) study the impact of the Basel Accord Regulations on Bank Capital and Risk Behavior in the MENA region. Using annual observations in 1995-2003, it is found that the capital requirements significantly affect banks' capital ratio decisions and that regulatory pressure did not induce banks to increase their capital, but did positively affect their chosen risk levels.

In general, capital or net worth serves as a buffer against losses and, hence, failure. Many developing countries have experienced banking problems requiring major reforms to address weak banking supervision and inadequate capital. In addition to deposit insurance (implicit or explicit), official capital adequacy regulations play a crucial role in aligning the incentives of bank owners with those of depositors and other creditors. Theory provides conflicting predictions on whether capital requirements curtail or promote bank performance and stability. The soundness of the banking system is important not only because it limits economic downturns related to financial panics but also because it avoids adverse budgetary consequences for governments, which often bears a significant part of the costs of bailouts. Prudential regulation is meant to protect the banking system from these problems by inducing banks to invest prudently. One form of prudential regulation is capital requirements.

The introduction of capital adequacy rules will normally strengthen bank capital and thus improve the resilience of banks to negative shocks. Nonetheless, the introduction of these rules may cause a shift from making loans to the private sector to providing credit to the public sector. Banks can fulfill their capital requirement ratios by reducing their risk-weighted assets or by increasing their capital.

3. The Sample, Models and Methodology

3.1. The Sample

The information used to estimate the models is taken from the Bureau Van Dijk's BankScope data base (Bank Scope, 2006), using unconsolidated financial statements or consolidated ones if the first are not available. The sample contains 28 banks observed over the period 1989-2004. The macro and finance data were collected from the World Bank World Development Indicators (WDI).

Table 1 presents a summary of statistics that describe the mean and standard deviations for all variables employed in our analysis, for the combined sample period, and in the periods before and after capital regulations.

Cost of intermediation, NIM1 is considerably lower in the pre-capital-regulation period, compared with the post-capital-regulation. Statistical significance supports the hypothesis of a significant increase in the cost of intermediation following introduction of capital

regulations. Higher internal risk for shareholders has induced a significant increase in the cost of intermediation. This evidence is robust using NIM2, the alternative measure for the cost of intermediation. In contrast, the evidence does not support a significant increase in returns on assets (ROA) or on equity (ROE) in the post-capital- regulation period, compared with the pre-regulation period.

The capital-to-assets ratio increased significantly in response to regulations of higher capital adequacy ratio. Since capital includes primary capital, paid-up capital and reserves, liquidity increases until banks manage to transfer additional capital into assets. Consistently, there is a significant increase in banks' liquidity in response to the new regulations.

Implicit cost, relative to implicit revenues, decreased significantly following the introduction of regulations. Nonetheless, there is no significant change in management efficiency (ratio of earning assets to total assets). It is interesting to note the significant increase in banks' size in the post-regulation period. As banks were forced to abide by the new capital requirements, the banking industry became characterized by larger size banks that pooled larger resources from a variety of shareholders. Cost efficiency (overhead/total assets) did not change significantly between the pre- and post-regulation periods. There was a significant reduction in reserves in the post-regulation period, compared with the previous period. Two factors might explain the difference: a reduction in the required reserve ratio on banks' deposits and/or a more developed banking structure that enabled banks to employ excess reserves effectively.

There was no significant change in bank's market power following the introduction of regulations. Consistently, there is evidence of a reduction in banks' concentration. Banks' concentration measures the ratio of assets in the three largest banks to total assets. Despite the increase in the average size of banks, the banking industry became more competitive after the introduction of regulations. There was a significant reduction in the size of assets at banks relative to assets in the stock market during the same period. This reflects development in the stock market that crowded out assets in the banking industry.

Macroeconomic indicators exhibit significant change in the post-regulation period, compared with the previous period. Inflation was significantly lower in the post-regulation period. Nonetheless, output appeared to be, on average, below its potential, as demonstrated by the negative output gap following the introduction of regulations. This is in contrast to a positive output gap, on average, in the previous period. The combined effects of lower growth and lower inflation indicate a slow-down in aggregate demand following the introduction of regulations.

3.2. Empirical Models

We seek to explain the cost of intermediation and profitability in the banking system in Egypt, using an empirical model that includes a measure of capital regulations plus a number of other major determinants. The variables chosen to measure the performance of banks along with those chosen as proxies of the internal and external determinants are shown in Table 2.

The specification of the empirical model is as follows:

$$Y_{ij,t} = c + \delta Y_{ij,t-1} + \sum_{b=1}^{B} \beta_b X_{it}^{l} + \sum_{m=1}^{M} \beta_m X_{it}^{m} + \varepsilon_{it} \qquad (1)$$

where $Y_{ij,t-1}$ is the one period lagged cost of intermediation or profitability, c is a constant term, δ is the speed of adjustment to equilibrium, X_{it}s with superscripts b and m denote bank-specific and macroeconomic determinants respectively and ε_{it} is the disturbance.

The cost of intermediation variable is represented by two alternative measures: the ratio of net interest revenue over average interest-bearing assets (NIM1) and the ratio of net interest income over average total assets (NIM2).

The profitability variable is also represented by two alternative measures: the ratio of net income to assets, namely the return on assets (ROA) and the profits to equity ratio, namely the return on equity (ROE). ROA reflects the ability of a bank to generate profit from the bank's assets and ROE indicates the return to shareholders on their equity.

We employ three measures of capital regulation. The first is a continuous measure of the ratio of capital to total assets (CAPR). Banks attempt to accommodate the capital requirement by raising the contribution of shareholders or decreasing assets, particularly risky assets. To test the effects of the capital ratio over time, we incorporate a dummy variable that takes a zero value before the change in capital regulation and one thereafter. If the effects of capital regulation on the cost of intermediation persist over time we expect a statistically significant coefficient on this dummy variable. Further, to study the short-run dynamics of the effects of the change in capital regulation, we incorporate a dummy variable that takes the value of one in the year of the change in capital requirements and increases by an increment of one over subsequent three lags. The significance of each of the dummies in the current and three subsequent periods indicates the persistent effect of capital regulations on the dependent variable in the short-run. A summary of the empirical models is as follows:

- Model 1 with the capital ratio:

$$Y_{ij,t} = c + \delta Y_{ij,t-1} + \lambda \mathrm{CAPR}_{\mathrm{i,t}} + \sum_{b=1}^{B} \beta_b X_{it}^{l} + \sum_{m=1}^{M} \beta_m X_{it}^{m} + \varepsilon_{it} \quad (2)$$

  where *CAPR* is equal to Equity over total assets.

- Model 2 with the long-term dummy variable:

$$Y_{ij,t} = c + \delta Y_{ij,t-1} + \lambda \mathrm{CAPD}_{\mathrm{i,t}} + \sum_{b=1}^{B} \beta_b X_{it}^{l} + \sum_{m=1}^{M} \beta_m X_{it}^{m} + \varepsilon_{it} \quad (3)$$

  where *CAPD* is a dummy variable that takes 1 in the current year and subsequent years following the implementation of capital requirement and 0 before.

- Model 3 with the four short-term dummy variables:

$$Y_{ij,t} = c + \delta Y_{ij,t-1} + \lambda_1 \mathrm{Crd}_{\mathrm{i,t}} + \lambda_2 \mathrm{PostCrd1}_{\mathrm{i,t}} + \lambda_3 \mathrm{PostCrd2}_{\mathrm{i,t}} + \lambda_4 \mathrm{PostCrd3}_{\mathrm{i,t}} + \sum_{b=1}^{B} \beta_b X_{it}^{l} + \sum_{m=1}^{M} \beta_m X_{it}^{m} + \varepsilon_{it} \quad (4)$$

where Crd_i is a variable that equals one in the year that country i implements capital requirement. $PostCrd1_i$ takes the value 1 in the first year after implementation, $PostCrd2_i$ takes the value 1 in the second year after implementation, and $PostCrd3_i$ takes the value 1 in the third year after implementation.

In addition to capital requirements, the list of bank specific variables in the model includes the following which are derived from the theoretical models of Ho and Saunders (1981), Allen (1988) and Angbazo (1997):

- Liquidity (Liq): is the ratio of net loans over deposit and short term borrowing. Higher figures denote lower liquidity. This variable measures the risk of not having sufficient reserves of cash to cope with withdrawal of deposits. Predictions vary regarding the effects of liquidity on the cost of intermediation and profitability. One view suggests that excess liquidity may force banks to lower the cost of intermediation as they try to reduce non-earning assets. Alternatively, in a tight financial market where demand for

credit is limited, banks may be forced to raise the cost of intermediation in an attempt to increase profits.

- Implicit cost (Implicit): non-interest expenses relative to non-interest revenues. Higher implicit cost is likely to reduce profit and induce an increase in the cost of intermediation.
- Management efficiency (Maneff): the ratio of earning assets to total assets. The higher the ratio the higher management efficiency is. As managers strive for more earnings, it is likely that they would increase the cost of intermediation, which would enhance profits. However, Casu and Girardone (2004) point out that « …the most cost efficient banking groups seem to be also the least profitable, » p. 693.
- Bank size (Bsize): the log of total assets in a bank. This may serve as a proxy for the degree of monopoly. The bigger the size of the bank, the higher the degree of monopoly power which enables banks to charge a higher cost of intermediation. Profits are likely to increase as a result of economies of scale. However the empirical results concerning bank size are mixed, since some studies found economies of scale for large banks (Berger and Humphrey, 1997) and others diseconomies for larger banks (Vander Vennet, 1998).
- Cost efficiency (Costeff): the cost of overhead to total assets. The higher the cost the less profitable banks are. To counter this effect, banks would charge a higher cost of intermediation.
- Reserves: banks' reserves at the central bank. Similar to liquidity, higher reserves may stimulate a reduction in the cost of intermediation to push out excess reserves and increase profits. Alternatively, higher reserves may induce an increase in the cost of intermediation to make up for excess reserves and generate more earnings.
- Market power (Mpower): measured as market share in terms of total assets serves as a proxy for the degree of monopoly, which may induce an increase in the cost of intermediation and banks' profits. The relationship between bank profitability and market structure can be studied under three hypotheses: the structure-conduct-performance (SCP), the efficient-structure (ES) and the relative-market-power hypotheses. The SCP hypothesis suggests that the positive relationship between interest margins and market structure is due to non-competitive pricing behavior in more concentrated markets. However, the RMP hypothesis asserts that only firms with high market power and product differentiation from the competitors are able to extract non-competitive profits (Berger, 1995a). The ES hypothesis suggests that differences in interest margins are attributable to differences in operational efficiency across banks and lead to a negative relationship between operational efficiency and interest margins. One way to deal with the three hypotheses is to include measures for concentration, market share and operational efficiency into our models.
- Interaction dummy: equals one if the ratio of equity to total assets is equal or larger than the median and zero otherwise. The dummy variable interacts with the ratio of equity to total assets to test whether the impact of bank capitalization on performance depends on its level.

We also include macroeconomic variables as well as financial structure indicators to control for the effect of external factors on the cost of intermediation and operating performance of Egyptian banks:

- Inflation (Inf) may affect the cost of intermediation indirectly. Inflation raises incentives to increase savings and decrease demand for credit and, therefore, banks' profits. To generate more demand for credit, banks may lower the cost of intermediation.

- Bank concentration (Conc): the size of banks' assets in the three largest banks to total assets. The higher the concentration ratio, the more monopoly power there is in the banking system, enabling banks to increase the intermediation cost and generate more profits.
- Business Cycle (Buscycle): the output gap such that an increase indicates a boom. During a boom, the demand for credit increases which is likely to increase the cost of intermediation and generate more profits.
- Financial structure (Fts): banks' assets relative to assets in the stock market. The higher this ratio the more dominant banks are in the financial structure, enabling them to charge a higher cost of intermediation and generate more profits.
- Interest liberalization (Irlib): a dummy variable that marks the change in interest rate management. As the central bank liberalized the interest rate following a history of administered rates, the cost of intermediation, and in turn profitability, is likely to be affected.

3.3 Econometric Modeling

Empirical work on determinants of bank's profitability can potentially suffer from two sources of inconsistency: omitted variable and endogeneity biases. With this in mind, we first describe how these biases affect cross-section and panel data estimators and then present the Generalized Method of Moments (GMM) estimator, which corrects for both of these biases and takes into account the dynamics of dividend policy.

Pure cross-section regressions give inconsistent estimation results because they suffer from both the omitted variable and endogeneity bias. Cross-section dividend policy analyses lead to biased estimates because the firm-specific error term ε_i is likely to contain unobserved firm effects, as for example differences in the quality of management, and is correlated with the lagged dependent variable. Therefore, cross-section regressions give inconsistent estimates as the assumption that the regressors and the error term are not correlated is violated.

Combining cross-section and time-series data is useful for three main reasons. First, it is necessary when analyzing the determinants of the performance of Egyptian banks because it varies over time, and the time-series dimension of the variables of interest provides a wealth of information ignored in cross-sectional studies. Secondly, the use of panel data increases the sample size and the degree of freedom, which is particularly relevant when a relatively large number of regressors and a small number of firms are used, which is the case here. Thirdly, panel data estimation can improve upon the issues that cross-section regressions fail to take into consideration, such as potential endogeneity of the regressors and controlling for firm-specific effects.

For panels with a limited number of years and a substantial number of observations, Arellano and Bond (1991) suggest estimating the equation in 3.2 with Generalized Method of GMM in first-differences. They proceed by first differencing the initial equation, which removes the time invariant u_i and leaves the equation estimable by instrumental variables.

$$y_{it} - y_{it-1} = \alpha_i (y_{it-1} - y_{it-2}) + \beta (x_{it} - x_{it-1}) + (u_i - u_i) + (v_{it} - v_{it-1})$$

Assuming that there is no serial correlation in the disturbance ε_{it}, all the lagged levels of variables can be used as valid instruments in the first-differenced equation. Similarly, allowing for a possible correlation between x_{it} and v_{it}, only lagged values dated t-2 and earlier will be used as instruments. This allows the endogeneity of the regressors as it is likely that shocks affecting dividend choices may also affect other exogenous variables.

However, while first-differencing a new bias is introduced: the new error term $(v_{it} - v_{it-1})$ is correlated with the lagged dependent variable $(y_{it-1} - y_{it-2})$. Assuming that the error terms are

not autocorrelated and that the x_{it} are weakly exogenous (meaning uncorrelated with future realizations of the error term), Arellano and Bond (1991) propose the following set of moment conditions:

$E [y_{it-s} (v_{it} - v_{it-1})] = 0$ for t =3, …, T and s >= 2

$E [x_{it-s} (v_{it} - v_{it-1})] = 0$ for t =3, …, T and s >= 2

Under these moment conditions, Arellano and Bond (1991) propose a two-step GMM estimator. In fact, the one-step estimator is assumed to render v_{it} serially uncorrelated. However, whenever v_{it} are heteroskedastic, we can obtain a more asymptotically efficient two-step estimator using $v_{it,}$ the residuals obtained from the preliminary step so as to construct a consistent estimate of variance-covariance matrix, thus relaxing the assumptions of independence and homoskedasticity (see White, 1980). In brief, the one-step estimator assumes homoskedastic errors while the two-step estimator uses the first-step errors to construct heteroskedasticity-consistent standard errors. Therefore, the one-step estimators are less efficient than the two-step estimators even in the presence of homoskedasticity of the error terms. However, the asymptotic standard errors associated with the two-step estimates may be biased downward when the number of firms is limited.

Since our T is large enough (T=14), it is more appropriate to use the system GMM estimator of Arellano and Bower (1995) and Blundell and Bond (1998). The basic idea behind this estimator is: 1) the unobserved fixed effects μ_i are removed by taking first difference in equation, 2) the right hand side variables are instrumented using lagged values of the regressors, and the equation in first differences and in levels are jointly estimated and 3) the validity of the instruments is tested using a Hansen test of over-identifying restrictions and a test of the absence of serial correlation of the residuals. Although the two-step estimator is asymptotically more efficient in presence of heteroskedasticity of the error term, Arellano and Bond (1991) and Blundell and Bond (1998) show that the two step estimates are biased in small samples. As our dataset contain a small number of firms, we prefer to display the one-step result both in the level and system GMM estimations.

4. Empirical Results:

4.1 The Determinants of the Cost of Intermediation

For each measure of the cost of intermediation, Table 3 summarizes the results of estimating the three models that employ one of the following: the capital/assets ratio, the long-term dummy variable for capital regulations, or the four short-term dummy variables for capital regulations.

The drawback of the static model results is that the right-hand side variables maybe endogenous and, therefore, affected by the dependent variable. To account for persistence in the dependent variable and endogeneity of right-hand side variables, we resort to a dynamic model estimation that uses an instrumental variable approach to proxy for endogenous variables.

The lagged dependent variable measures the degree of persistence in the cost of intermediation. The lagged dependent variable is statistically significant across all models, indicating a high degree of persistence characterizing cost of intermediation and justifying the use of dynamic models.

The capital variable (capital/assets) has a positive and statistically significant effect, raising the cost of intermediation. Banks raise the cost of intermediation to make up for a higher risk to shareholders. This finding is in accordance with those of Berger (1995a), Demirgüç-Kunt and Huizinga (1999), Ben Naceur and Goaied (2003), Kosmidou and Pasiouras (2005), indicating that well capitalized Egyptian banks face lower costs of going bankrupt, which

facilitate a reduction in the cost of funding. The result is higher profitability, as further analyzed below. Nonetheless, the long-term dummy variable is not statistically significant, indicating that capital regulations do not have a sustained long-term effect on the cost of intermediation. The short-term dummies of capital regulations, in Model 3, present interesting evidence. In the current year, the change of capital regulations does not impact significantly on the cost of intermediation. Progressively over time, the cost of intermediation responds positively and significantly to capital regulations, as evident by the positive and significant coefficients of the dummy variables at leads two and three. The interactive dummy is not significant, indicating that the impact of bank capitalization on performance does not depend on the level of capital across banks.

Liquidity has a positive and statistically significant effect on the cost of intermediation, as evident in Models 1 and 2 in Table 3. The ratio of net loans to customer and short term funding (LOFUND) is statistically significant and positively related to the profitability of domestic banks, indicating a negative relationship between bank profitability and the level of liquid assets held by the bank, in consistency with our expectations and some earlier studies (Molyneux and Thornton, 1992, Guru et al., 1999 and Pasiouras and Kasmidou, 2007). While banks receive lower returns on holding excess cash or securities, they face a competitive market for deposits (Demirgüç-Kunt et al., 2003).

It is interesting to note the positive effect of liberalizing the interest rate in Model 3. The cost of intermediation increased as a result of a shift from administered to a market interest rate, although the result is not robust across all specifications. There are micro and macro factors that may have contributed to this result. At the macro level, the interest rate may be responding to the priorities set out by the central bank. As the exchange rate was pegged to the dollar, the central bank managed the interest rate policy with an objective to defend the pegged exchange rate. As a result, the interest rate was set at a high rate to guarantee the inflow of foreign capital that is necessary to sustain a peg. At the micro level, the structure of the banking system (lack of competition) may have supported high cost of intermediation, absent serious competition from other small non bank financial institutions and stock market.

Management efficiency has a positive and significant effect on interest margins, indicating managers shift the cost of improved efficiency by overcharging customers. None of the coefficients on market power and market share is statistically significant to explain cost of intermediation. Hence, the results reject all the three hypotheses linked to market power and suggest that commercial banks in Egypt did not use their monopoly power in setting their lending and deposit rates

None of the coefficients on bank size or cost efficiency explains the cost of intermediation significantly. Reserves have a statistically significant negative effect on the cost of intermediation in all models. Thereby, commercial banks try to reflect the opportunity costs of keeping reserves (financial taxation) that erode their profitability by widening their interest margins. Financial structure, in Models 2 and 3, has a positive and statistically significant effect on the cost of intermediation. The bigger the share of banks, relative to the stock market, the higher is the cost of intermediation that banks have. The dominant role of banks (in light of underdevelopment in the stock market) enables them to charge a higher lending rate.

Across the three specifications, inflation has a negative and statistically significant effect on the cost of intermediation contrary to the findings of previous studies (Claessens et al., 1998; Demirgüç-Kunt and Huizenga, 1999). This counterintuitive result could be explained by the fact that higher inflation rate increases uncertainty and reduces demand for credit. Banks attempt to counter this environment by reducing the cost of intermediation. Also this negative impact of inflation on interest spread means that Egyptian banks support the rise of inflation

by delaying the increase of their lending rate rather than widening the spread between lending and deposit rates. The business cycle measure has a positive and statistically significant effect on the cost of intermediation. Higher growth during a boom period increases demand for credit, enabling banks to charge a higher cost of intermediation.

The combined evidence suggests that a number of factors have pushed up an increase in the cost of intermediation in the post-capital regulation period: higher capital to assets ratio, an increase in management efficiency, and a reduction in inflation. The increase in cost of intermediation attributed to these factors was countered by a decline in output growth, which is likely to have moderated the cost of intermediation in the post-capital regulation period. The results are robust across the two measures of net interest margins, regardless of the definition of spreads.

4.2 The Determinants of Bank Profitability

To complete the analysis regarding the effects of capital regulations, we study determinants of banks' profitability, as measured by the returns on assets and equity. Table 4 summarizes the results of the model explaining return on equity using dynamic estimation. The GMM-in-System specifications seem to fit the panel data reasonably well since the Hansen test shows no evidence of over-identifying restrictions and the second-order autocorrelation was absent. Persistence is evident by the positive and significant response of return on equity and assets to their lag, justifying the use of dynamic panel data modeling. Besides, this persistence of profit means the forces of competition are not sufficiently strong to cause all abnormal profits to dissipate within a one-year time span. In the present study the estimates on lagged profitability ratios range between 0.425 to 0.579 and this finding is slightly higher compared to the estimate reported by Gibson (2005) and Athanasoglou et al. (2005) for Greek banks but contrast with the finding by Goddard et al. (2004) indicating lack of profit persistence in European banks. These results indicate that competition in the Egyptian banking sector lags behind Western European countries.

The capital adequacy variable (capital/assets) has a positive and significant effect on returns on assets. This finding is consistent with previous studies (for example, Berger, 1995, Demirguc-Kunt and Huizinga, 1999, Goddard et al., 2004, Kosmidou et al., 2005) providing support to the argument that well capitalized banks face lower costs of going bankrupt and reduce the cost of funding, resulting in higher profitability. Further, as Berger (1995b) points out, high capital ratio lowers the cost of insured debt. However, high capital ratio does not increase returns on equity (ROE),[2] implying unexpected losses have been exactly offset by an increase in the operating profit through an interest margin increase. Moreover, the effect of capital regulation on banks' profitability is not sustained over time. The coefficient on the long-term dummy is not statistically significant in the estimation of either return on equity or return on assets. In contrast to the evidence for the cost of intermediation, returns on equity and assets increase in the current period that marks the change in capital regulation, which is sustained two years after the implementation of capital regulation in Egypt. The interactive dummy variable is not significant, indicating that the relationship between capital and profitability does not vary with the level of capital across banks.

Banks' liquidity does not determine returns on assets or equity significantly. In contrast, management efficiency is evident to have a positive and significant effect on bank's profits, implying shareholders benefit directly from improvement in management efficiency. Bank size does not generate higher returns on assets. Cost efficiency (overhead/total assets) does not impact significantly on banks' profitability. Inflation and bank concentration are not

[2] Return on assets is a better measure of banks' profitability as it represents the rate of return on portfolio investment and it is not affected by exceptional events.

statistically significant to determine returns on equity and capital. Further, the positive and significant effect of the increase in reserves on bank's profitability is not robust across models.

Interest rate liberalization does not have a statistically significant effect on returns on capital or equity. Consistent with our intuition, higher implicit cost (non-interest cost relative to non-interest return) has a negative and statistically significant effect on return on assets and equity. Implicit cost is not supported by banks' customers; instead shareholders' profits absorb the additional cost of intermediation. Finally, the business cycle measure has a positive and statistically significant effect on returns on equity and assets. During a boom, banks are able to generate higher return and increase profitability, as evident by the positive and statistically significant coefficients. Downward cycles generate concerns about the ability of banks to maintain profitability. Statistical significance does not support a significant change in returns on equity and assets in post-regulations period.

To sum, a number of factors contributed positively to banks' profitability in the post-regulation period: higher capital requirements and the reduction in implicit cost. Counter effects on banks' profitability are attributed to reduction in economic activity, which is likely to have decreased banks' profitability in the post-regulation period. There is also some evidence, although not robust across models, indicating that the reduction in reserves may have decreased returns on equity significantly in the post-regulation period. Banks are less motivated to generate earnings in response to a reduction in reserves. All estimated equations show that the impact of bank size on return is absent. This result confirms those of Athanasoglou et al. (2005), suggesting that small-size banks usually try to grow faster, even at the expense of their profitability.

5. Summary and Conclusions

The aim of this investigation has been to investigate the effects of capital regulations on the performance and stability of banks in Egypt. Two measures of performance are under investigation: cost of intermediation and banks' profitability, as measured by return on assets or equity. Higher cost of intermediation decreases banks' profitability and proves to be detrimental to financial stability.

We investigate the effect of capital regulations in three dimensions. First, we test the effect of the ratio of capital to total assets on the cost of intermediation and profitability. Second, we introduce a dummy variable that captures the structural break marking the introduction of capital regulation to test the sustained long-term effects. Third, we introduce four short-term dummies to test the progressive effects of capital regulations in the current period and three subsequent ones.

The results provide a clear illustration of the effects of capital regulations on the cost of intermediation and banks' profits. As the capital adequacy ratio internalizes the risk for shareholders, banks increase the cost of intermediation, which supports higher return on assets and equity. These effects appear to increase progressively over time, starting in the period when capital regulations are introduced and continuing two years after the implementation. Nonetheless, the evidence does not support the hypothesis of a sustained effect of capital regulations over time, or variation in the effects with the size of capital across banks.

In addition to the above effects, the empirical estimation unveils interesting features about the effects of banking-specific and macro variables on the performance of banks in Egypt. Management efficiency, market concentration and the underdevelopment of the stock market relative to the dominant size of banks resulted in an increased cost of intermediation. The results are robust, regardless of the definition of spreads defining net interest margins.

Among the macro variables, inflation proved to be an important factor that depresses the cost of intermediation in an effort to stimulate demand for credit. A pickup in output growth appears to be the most important factor that increases demand for credit, enabling banks to charge a higher cost of intermediation.

The combined evidence suggests that a number of factors have pushed up an increase in the cost of intermediation in the post-capital regulations period: higher capital-to- assets ratio, an increase in management efficiency, and a reduction in inflation. The increase in the cost of intermediation attributed to these factors was countered by the reduction in output growth and an increase of liquidity, which are likely to have moderated the cost of intermediation in the post-capital regulation period.

A number of factors contributed positively to banks' profitability in the post-regulation period: higher capital requirements, the reduction in implicit cost and the increase in management efficiency. Countering effects on banks' profitability were attributed to the reduction in economic activity and to a lesser extent to the reduction in reserves. An improvement of cost efficiency is not reflected in a reduction in the cost of intermediation or an improvement in profit. The effect of better efficiency is likely to have been absorbed in banks' fees and commissions.

Overall, the results point to the importance of capital regulation to the performance of banks and financial stability in Egypt. Moreover, the state of the economy is a major factor that determines the performance of the banking industry. Financial stability could be at risk as a result of shocks impinging on the economic system, absent proper policy adjustments to mitigate the effects of these shocks. Banks set the cost of intermediation in an attempt to influence profitability and maintain stability, given excess liquidity and binding constraints governing demand for credit.

For policy implications, the results indicate the importance of reviving demand for credit using macroeconomic policies. Provided that robust demand for credit exists, structural reforms should aim at establishing more competition in the banking industry to ensure that performance indicators are commensurate with the optimal practices of the intermediation function that guarantees financial stability over time. The results raise a cautionary flag. Government policies that rely excessively on direct government supervision and regulation of bank activities should in parallel foster incentives for private agents to promote bank development, performance and stability.

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Table 1 – Summary Statistics

	Mean	Std. Dev.	Mean before Reform	Mean after Reform	Difference in Mean
Nim1	0.019	0.016	0.015	0.022	0.006***
					(4.15)
Nim2	0.018	0.015	0.014	0.021	0.006***
					(4.02)
ROA	0.012	0.012	0.011	0.012	0.001
					(0.99)
ROE	0.129	0.127	0.141	0.119	-0.021*
					(-1.62)
Capratio	0.092	0.051	0.083	0.100	0.016***
					(3.14)
Liq	0.451	0.133	0.405	0.487	0.081***
					(6.24)
Implicit	-.0039	.0006	-.0059	-.0026	0.003**
					(2.62)
Maneff	0.929	0.059	-0.005	-0.002	0.003**
					(2.62)
Bsize	7.98	1.468	7.648	8.253	0.605***
					(4.12)
Costeff	0.018	0.009	0.018	0.018	0.000
					(0.06)
Reserves	0.044	0.054	0.052	0.041	-0.012*
					(-1.81)
Mpower	0.041	0.071	0.046	0.036	-0.009
					(-1.37)
Buscycle	-0.005	0.269	0.012	-0.010	-0.022***
					(-8.94)
Conc	0.615	0.035	0.637	0.599	-0.038***
					(12.58)
Fts	0.027	0.015	0.038	0.018	-0.020***
					(-16.55)
Inf	0.08	0.058	0.134	0.037	-0.096***
					(-28.98)

Table 2 - Variables Description

Variables	Description
Dependent	
NIM1	The ratio of net interest revenue over average interest-bearing assets.
NIM2	The ratio of net interest income over average total assets.
ROA	The ratio of net income to assets.
ROE	The profits to equity ratio.
Independent	
Banks Characteristics	
Capratio	This is a measure of capital adequacy, calculated as equity to total assets. High capital-asset ratios are assumed to be indicators of low leverage and therefore lower risk
Dumcap	One if the ratio of equity to total assets is equal or larger than the median, zero otherwise. The dummy variable interacts with the ratio of equity to total assets to test whether the impact of bank capitalization on performance depends on its level.
Caplong	*CAPD* is a dummy variable that takes 1 in the current year and subsequent years following the implementation of capital requirement and 0 before.
Maneff	The ratio of earning assets to total assets. The higher the ratio the higher management efficiency is.
Reserves	Banks' reserves at the central bank.
Costeff	The cost of overhead to total assets. Higher ratios imply a less efficient management. The higher the cost the less profitable banks are.
Liq	This is a measure of liquidity calculated as loans to customers and short term funding. Higher figures denote lower liquidity
Bsize	The book value of the bank's total assets. This may serve as a proxy for the degree of monopoly.
Markpower	This is a measure of market power, calculated as market share in terms of total assets.
Implicit	Non-interest expenses relative to non-interest revenues. Higher implicit cost is likely to reduce profit and induce an increase in the cost of intermediation.
Macroeconomic and financial structure	
Inf	The annual inflation rate.
Fts	Banks' assets relative to assets in the stock market. The higher this ratio the more dominant banks are in the financial structure.
Conc	The size of banks' assets in the three largest banks to total assets. The higher the concentration ratio, the more monopoly power there is in the banking system.
Buscycle	The output gap such that an increase indicates a boom.
Irlib	A dummy variable that marks the change in interest rate management. It takes 1 after the liberalization date and 0 otherwise.

Table 3 –Determinants of Cost of Intermediation[3]

Regressors	Capratio		Caplong		Capshort	
	NIM1	NIM2	NIM1	NIM2	NIM1	NIM2
Intercept	-0.188***	-0.181***	-0.111***	-0.107***	-0.101***	-0.098***
	(-4.57)	(-4.78)	(-3.46)	(-3.50)	(-2.76)	(-2.85)
Nim_{t-1}	0.312***	0.308***	0.445***	0.439***	0.499***	0.485***
	(3.54)	(3.53)	(4.88)	(4.86)	(5.56)	(5.52)
Liq	0.022***	0.021***	0.021***	0.018***	0.015***	0.014***
	(3.87)	(4.08)	(3.73)	(3.83)	(2.72)	(2.90)
Capratio	0.141***	0.129***	___	___	___	___
	(2.91)	(3.10)				
Capratio*Dumcap	-0.005	-0.006	___	___	___	___
	(-0.21)	(-0.27)				
Caplong	___	___	0.001	0.001	___	___
			(0.56)	(0.44)		
Bdate	___	___	___	___	0.002	0.002
					(1.38)	(1.31)
Bdate1	___	___	___	___	0.002	0.002
					(1.32)	(1.31)
Bdate2	___	___	___	___	0.006***	0.005***
					(2.71)	(2.68)
Bdate3	___	___	___	___	0.0039**	0.0034**
					(2.32)	(2.26)
Irlib	-0.019	-0.022	0.008	0.007	0.011*	0.009*
	(-0.35)	(-0.42)	(1.14)	(1.07)	(1.78)	(1.62)
Implicit	0.203	0.171	0.143	0.119	0.153	0.1213
	(1.11)	(1.12)	(0.74)	(0.73)	(0.80)	(0.75)
Maneff	0.129***	0.128***	0.091***	0.091***	0.089***	0.091***
	(5.56)	(6.32)	(5.32)	(5.30)	(4.13)	(4.27)
Bsize	0.002	0.002	0.001	-0.001	-0.001	-0.001
	(0.95)	(0.91)	(0.46)	(-0.44)	(-0.08)	(-0.13)
Costeff	-0.311	-0.281	-0.191	-0.185	-0.219	-0.206
	(-1.17)	(-1.16)	(-0.79)	(-0.84)	(-1.07)	(-1.07)
Reserves	0.131***	0.118***	0.082***	0.072***	0.071***	0.063***
	(5.69)	(5.87)	(4.57)	(4.04)	(2.87)	(2.74)
Markpower	-0.018	-0.017	0.015	0.011	-0.006	-0.007
	(-0.53)	(-0.54)	(0.35)	(0.35)	(-0.26)	(-0.33)
Fst	0.194	0.175	0.291*	0.259*	0.419**	0.365**
	(1.51)	(1.51)	(1.73)	(1.71)	(2.46)	(2.38)
Inf	-0.056**	-0.051**	-0.083***	-0.076***	-0.073***	-0.067***
	(-2.34)	(-2.35)	(-2.75)	(-2.75)	(-2.84)	(-2.75)
Bankconc	0.0706**	0.063**	0.041	0.037	0.007	0.011
	(2.18)	(2.09)	(1.01)	(1.01)	(0.171)	(0.25)
Buscycle	0.011***	0.011***	0.016***	0.014***	0.018***	0.016***
	(3.50)	(3.46)	(3.63)	(3.54)	(4.28)	(4.24)
Hansen test	16.19	16.15	9.16	10.62	9.24	10.50
AR(1)	-2.17**	-2.23**	-2.32**	-2.38**	-2.43**	-2.49**
AR(2)	0.176	0.135	-1.13	-1.06	-1.01	-0.82
N.of obs	237	237	237	237	237	237

[3] **Note**: Dependant variables are NIM1 et NIM2.

Estimation method is one-step GMM-in-System estimator.

Hansen = Hansen test for validity of over-identifying restrictions, distributed as indicated under null.

AR(2) = test of null of zero second-order serial correlation, distributed N(0,1) under null.

Numbers in parentheses are t-statistics. *, ** and *** indicates statistical significance at the 1%, 5% and 10% level.

Table 4 –Determinants of Bank Performance[4]

Regressors	Capratio		Caplong		Capshort	
	ROA	ROE	ROA	ROE	ROA	ROE
Intercept	-0.1463***	-0.877***	-0.053*	-0.512*	-0.054*	-0.601*
	(-3.88)	(-3.07)	(-1.64.)	(-1.79)	(-1.90)	(-1.80)
ROA&E_{t-1}	0.479***	0.456***	0.567***	0.441***	0.579***	0.425***
	(6.15)	(3.79)	(7.52)	(4.00)	(8.45)	(4.00)
Liq	0.001	0.043	0.004	0.047	-0.001	0.005
	(1.08)	(0.82)	(0.02)	(0.78)	(-0.05)	(0.10)
Capratio	0.122**	0.522	___	___	___	___
	(2.27)	(0.70)				
Capratio*Dumcap	-0.004	-0.068	___	___	___	___
	(-0.16)	(-0.22)				
Caplong	___	___	0.000	-0.026	___	___
			(0.02)	(-0.79)		
Bdate	___	___	___	___	0.004**	0.059**
					(2.06)	(2.12)
Bdate1	___	___	___	___	0.002	0.035
					(1.42)	(1.33)
Bdate2	___	___	___	___	0.006***	0.077**
					(3.02)	(2.64)
Bdate3	___	___	___	___	0.002	0.034
					(0.75)	(1.11)
Irlib	-0.004	-0.083	-0.004	-0.123***	0.004	-0.009
	(-0.79)	(-1.60)	(-0.79)	(-2.59)	(0.82)	(0.15)
Implicit	-0.303***	-0.2.63***	-0.357***	-3.011***	-0.313***	-2.657***
	(-3.50)	(-3.66)	(-4.26)	(-4.41)	(-4.43)	(-4.62)
Maneff	0.097***	0.681***	0.053**	0.534**	0.048**	0.518**
	(3.11)	(2.89)	(1.93)	(2.46)	(2.40)	(2.42)
Bsize	0.003**	0.022	-0.001	0.005	0.001	0.028
	(2.04)	(1.40)	(-0.62)	(0.27)	(0.73)	(1.34)
Costeff	-0.005	0.428	-0.115	0.815	0.139	0.837
	(-0.005)	(0.31)	(-0.71)	(0.57)	(1.00)	(0.61)
Reserves	0.076**	0.491*	0.034	0.359	0.022	0.271
	(2.30)	(1.81)	(1.28)	(1.49)	(1.03)	(1.07)
Markpower	0.001	0.074	-0.015	-0.179	-0.017	-0.394*
	(0.02)	(0.18)	(-0.51)	(-0.73)	(-0.85)	(-1.82)
Fst	0.056	0.333	-0.026	-0.738	0.153	2.063*
	(0.76)	(0.44)	(-0.27)	(0.404)	(1.55)	(1.77)
Inf	-0.056**	-0.074	-0.019	-0.251	-0.006	0.121
	(-2.34)	(-0.39)	(-1.03)	(-1.18)	(-0.40)	(0.70)
Bankconc	0.033	0.178	0.025	0.274	-0.008	-0.107
	(1.40)	(0.75)	(0.93)	(1.14)	(-0.29)	(-0.31)
Buscycle	0.008***	0.101***	0.008***	0.084**	0.009***	0.106***
	(4.02)	(3.00)	(2.90)	(2.04)	(3.57)	(2.57)
Hansen test	11.88	10.41	15.49	13.37	5.82	12.93
AR(1)	-2.77***	-1.73*	-2.61***	-1.70*	-2.66***	-1.65**
AR(2)	0.79	-0.88	0.63	-0.67	0.47	-1.12
N.of obs	237	237	237	237	237	237

[4] **Note**: Dependant variables are ROA et ROE.

Estimation method is one-step GMM-in-System estimator.

Hansen = Hansen test for validity of over-identifying restrictions, distributed as indicated under null.

AR(2) = test of null of zero second-order serial correlation, distributed N(0,1) under null.

Numbers in parentheses are t-statistics. *, ** and *** indicates statistical significance at the 1%, 5% and 10% level.