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# **Market Discipline and Deposit Insurance: Evidence from Some Middle Eastern Banks**

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## Abstract

Financial development, which involves the establishment and expansion of institutions, instruments and markets, plays an important role in economic growth given that they can ameliorate information and transaction costs, facilitate a more efficient mobilization of savings, spread risk and provide liquidity. Moreover, given the high costs of banking crises, regulators always seek the means that promote greater levels of prudence in banks' behavior. Indeed, this can be done by relying on certain regulatory actions (supervision and regulations) and on market discipline. In turn, market discipline relies on private sector agents (equity holders and debt holders) to produce information that assists bank supervisors in recognizing potential banking problems and in implementing remedial measures.

The primary objective of this research is to provide answers to two questions. First, do depositors discipline Jordanian, Kuwaiti, Omani, and Saudi banks? Second, does the deposit insurance design have any bearing on market discipline – given the fact that Kuwaiti and Saudi deposits are 100 percent insured explicitly and implicitly respectively, while Jordanian and Omani deposits are insured up to \$14,000 and \$50,000 respectively.

Based on a sample of listed Jordanian, Kuwaiti, Omani, and Saudi banks during the time period 1997 – 2006, the overall results clearly indicate the absence of market discipline in Kuwait, Oman, and Saudi Arabia. In other words, market discipline is at work only in Jordan.

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## I. Introduction

Well-functioning financial intermediaries (banks) and markets (stock markets) play an important role in economic growth. They ameliorate information and transaction costs, facilitate a more efficient mobilization of savings, spread risk and provide liquidity. In other words, by providing these services, financial development (which involves the establishment and expansion of institutions, instruments and markets) can promote a more efficient allocation of scarce economic resources<sup>1</sup>.

Despite the economic importance of financial intermediaries, the fact that the costs of any bank failure are much greater than that of other businesses<sup>2</sup>, prompted banking research to examine the performance of banks in several aspects including determinants of accounting performance, bank lending channel, bank competition, bank efficiency, impact of foreign bank entry on the performance of local banks, the determinants of net interest margin, bank discipline, and others.

To avoid the occurrence of banking crises, regulators always seek to determine the means that promote greater levels of prudence in the behavior of banks. Market discipline, on the other hand, relies on private sector agents (equity holders and debt holders) in the production of information that is useful for bank supervisors in recognizing potential banking problems and in implementing remedial measures<sup>3</sup>. In other words, as banks undertake greater risk levels, depositors, for example, may “penalize” (discipline) riskier banks by requiring higher interest rates or by withdrawing their deposits.

There are many potential benefits from promoting and enhancing market discipline in a country’s banking sector. First, by punishing bank excessive risk-taking, market discipline reduces moral hazard incentives. Second, market discipline may improve the efficiency of banks by “forcing” less efficient banks to become either more efficient or exit the industry. Third, when combined with inside information about banks gained by supervisory procedures, bank discipline can increase the efficacy of the overall supervisory process. Finally, market discipline supplements the traditional supervisory assessments to distinguish between the performances of banks and therefore, lowers the overall social costs of bank supervision.

The issue of market discipline has generated a huge number of research papers. This research can be classified under one of four main groups. The first group of papers examines the contemporaneous relationship between bank risk levels and subordinated debt yields<sup>4</sup>. The second group attempts to detect evidence of market discipline by examining whether or not depositors withdraw deposits from, or require high deposit interests from riskier banks<sup>5</sup>. The third group of papers examines the issue of market discipline in terms of stock prices

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<sup>1</sup> For good surveys of the financial development and economic growth literature, see Levine (2004), FitzGerald (2006), Capasso (2006) and Papaioannou (2007). In addition, many papers examined the determinants of financial development (Baltagi et al., 2007). While Beck et al. (2004) examined whether financial development disproportionately raises the incomes of the poor and alleviates poverty, other researchers like Guiso (2004), Benfratello et al. (2006), Aghion et al. (2007) and Sharma (2007) examined the disproportionate positive effect on innovation by small firms. Finally, Hartmann et al. (2007) discussed the role of the financial system in the European economy.

<sup>2</sup> The budgetary costs of bank crises are large. They range from 3 percent of GDP to more than 55 percent of GDP (Caprio and Klingebiel, 2003).

<sup>3</sup> It is useful to note that Pillar 3 of the Basel Accord relies on enhancing bank disclosures to strengthen market discipline.

<sup>4</sup> See, for example, Iannotta (2007).

<sup>5</sup> See, for example, Imai (2006).

impounding bank information<sup>6</sup>. Finally, the fourth group of papers examines the relationship between bank risk and capital<sup>7</sup>.

Against the above brief account, the primary objectives of this research are to provide answers to the following two questions:

- 1- Do depositors discipline Jordanian, Kuwaiti, Omani, and Saudi banks?
- 2- Does the deposit insurance design have any bearing on market discipline – for example does it differ for depositors that Kuwaiti and Saudi deposits are 100 percent insured explicitly and implicitly respectively, while the Jordanian and Omani deposits are insured up to \$14,000 and \$50,000 respectively?

The importance of this research stems from a number of factors. First, the size of the banking systems in Jordan, Kuwait, Oman, and Saudi Arabia is large. For example, the 2005 figures indicate that total bank assets as a proportion of Gross Domestic Product (GDP) was equal to 234 percent, 92 percent, 59 percent, and 209 percent in Jordan, Kuwait, Oman, and Saudi Arabia respectively. On average, these ratios are much higher than, for example, the 91 percent in the Philippines, 26 percent in Romania, 117 percent in Thailand, 67 in Turkey and the 101 percent in Indonesia (Barth et al., 2004). Second, some of these countries have experienced bankruptcy cases. For example, by the time of its crash (1989), Petra was the third largest bank in Jordan and the “poverty stricken” Jordanian government was forced to pay \$200m to depositors who would otherwise have lost their savings, and to avert a possible collapse of the country’s entire banking system (Leigh and Whitaker, 2002, *The Guardian*). Such cases raise the importance of market discipline and its existence. Third, the fact that the Kuwaiti and Saudi deposits are 100 percent insured explicitly and implicitly respectively, and Jordanian and Omani deposits are insured up to \$14,000 and \$50,000 respectively, the results of this research should provide some insights into the impact of deposit insurance on market discipline. Finally, the issue of bank discipline in the Arab region has not been investigated. Indeed, the available literature contains a number of papers which examine other issues in the context of Arab banks. These include Darrat et al. (2002), Isik et al. (2004), Maghyereh (2004), Moustain (2004), Murinde and Yaseen (2004), Omet and Fayyoumi (2004), Omet and Al-Zubi (2005), Ben-Khedhir et al. (2005), Tarawneh (2006), Al-Muharrami et al. (2006), Al-Karasneh and Bolbol (2006), Al-Zubi et al. (2006), and others.

The rest of the paper is organized as follows. Section II provides a review of the international evidence about the issue of market discipline. In section III, we discuss the data and methodology and the results. Finally, section IV summarizes and concludes the paper.

## **II. The Issue of Market Discipline: A Literature Review**

In all countries, banks are supervised and regulated in order to control their liquidity and insolvency risk. Indeed, bank regulation is justified by the desire to maintain a safe and sound financial system (Hall and Miles, 1991)<sup>8</sup>. Moreover, as argued by Fama (1980) and Baltensperger and Demine (1991), bank regulation is warranted due to the fact that banks promote a more efficient mechanism for the allocation of funds by resolving the asymmetric information problem that exist between borrowers and lenders<sup>9</sup>.

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<sup>6</sup> See, for example, Docking et al. (1997); Billet et al. (1998); and Jordan et al. (2000)

<sup>7</sup> See, for example, Swindle (1995); Shrieves and Dahl (1992); and Flannery and Rangan (2003).

<sup>8</sup> For some, it is less clear why the market mechanism should not work for banks as it does for other corporations (Marquand, 1987; Goodhart, 1987; Benston and Kaufman, 1996).

<sup>9</sup> This issue (information asymmetry) might result in two basic problems; moral hazard and adverse selection.

The regulatory action of monetary authorities relies on the identification and “correction” of problems that might lead to financial failures. In principle, supervisors complement any mandatory bank reporting with periodic on-site bank examinations to arrive at information useful to determine the probability of banks’ failure<sup>10</sup>. Market discipline, on the other hand, relies on private sector agents (equity holders and debt holders) in the production of information that is useful for bank supervisors in recognizing potential banking problems and in implementing remedial measures. In other words, as banks undertake greater risk levels, private sector agents take actions on the basis of these costs (Berger, 1991). For example, depositors may “penalize” riskier banks by requiring higher interest rates or by withdrawing their deposits. “Market discipline is a regulatory mechanism that delegates the monitoring and disciplining task not only to the national and international regulator but also to the market participants whose wealth is affected by the banks’ conduct. Consequently the continuous ‘curse’ of disciplining measures by these market participants creates strong incentives for management to run their banks in a safe and sound way” (De Ceuster and Masschelein, 2003).

Relative to the above-mentioned sources of promoting greater levels of bank prudence (regulatory actions and market discipline), it is useful to note that Pillar 3 of the Basel Accord relies on enhancing bank disclosure to strengthen market discipline. Indeed, the New Basel Accord shifts the burden of bank supervision away from supervisors to markets. In his speech before the Conference on Reforming Bank Capital Standards, Meyer (1999) stated that market discipline is an “attractive tool for encouraging safety and soundness in a rapidly evolving environment. Market discipline is inherently flexible and adaptive with respect to innovations, since market participants have incentives to change the ways that they evaluate risks as innovations are adopted”.

The issue of market discipline has generated a lot of research interest. While it is extremely difficult to review this large and growing literature in this paper, it is useful to point out that the literature examines the issue of bank discipline in terms of four types of issues.

The first group of papers examines the contemporaneous relationship between bank risk levels and subordinated debt yields or deposit rates. Papers by Morgan and Stiroh (2001), Sironi (2002), Evanoff and Wall (2002), Jagtiani et al. (2002), and Krishnan et al. (2003) report that the issuance and secondary-market risk premiums on traded subordinated notes and debentures are correlated with accounting-based measures of bank risk, bank asset portfolio composition, credit- agency ratings, and the probability of bank failures.

The second group of research papers attempts to detect evidence of market discipline by examining the availability of funds. In other words, this research is based on the premise that as the perceived risk of a bank increases, holders of its liabilities react by withdrawing or withholding their investments (deposits). Similarly, such banks are expected to face higher borrowing costs. Goldberg and Hudgins (1996), Park and Peristiani (1998), Billet et al. (1998), Jagtiani et al. (2001), Hall et al. (2002) and others document some consistent evidence which shows that as the financial condition (risk) of financial intermediaries (banks and thrifts) worsens, their reliance on insured deposits increases. Similarly, McDill and Maechler (2003) report some evidence on market discipline. They found that the volume of uninsured deposits at banks with increasing risk levels falls even though these banks respond by offering higher rates on their liabilities (deposits). More recent papers include Ioannidou and de Dreu (2006), Imai (2006), and Murata and Hori (2006).

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<sup>10</sup> Financial regulation takes many forms including the lender of the last resort, deposit insurance, interest rate constraints and restrictions on entry and branching, and capital adequacy requirements.

The third group of papers examines the issue of market discipline in terms of stock prices impounding bank information. For example, the impact of changes in loan loss reserves, the announcement of supervisory actions and the announcement of changes in Moody's rating on stock prices have been examined by Docking et al. (1997), Jordan et al. (2000), and Billet et al. (1998) respectively. These studies document negative abnormal stock returns following the announcement of these announcements.

Finally, a number of papers examined the relationship between bank risk and capital. These papers are based on the argument that banks can keep their risk constant by balancing any change in their risk levels by changes in capital. For example, Swindle (1995) reports that changes in the regulatory capital ratio are a function of CAMEL ratings. Similarly, Shrieves and Dahl (1992) and Calomiris and Wilson find that increases in bank risk are reflected in bank capital increases. Finally, Flannery and Rangan (2003) document that increases in bank risk levels are often accompanied by capital increases.

To investigate the issue of market discipline and whether depositors respond to increases in bank risk levels, "ideally one should estimate a simultaneous equations model specifying demand and supply equations. In practice, however, this is very difficult, since it is hard to find exogenous variables that strongly affect either the supply or the demand equation. Hence, the empirical literature has tried to infer whether market discipline is present using reduced-form equations for the equilibrium interest rates and/or deposits" (Ioannidou and Dreu, 2006). In other words, most of the empirical literature estimates the following reduced-form equations:

$$\Delta\text{Deposits}_{i,t} = \alpha_1 + \beta_1 \text{BankRisk}_{i,t-k} + \gamma_1 \text{Controls}_{i,t-k} + \varepsilon_{i,t} \quad (1)$$

$$\text{DepositRate}_{i,t} = \alpha_2 + \beta_2 \text{BankRisk}_{i,t-k} + \gamma_2 \text{Controls}_{i,t-k} + \eta_{i,t} \quad (2)$$

where  $i = 1, \dots, N$  and  $t = 1, \dots, T$ , and  $N$  is the number of banks and  $T$  is the number of observations per bank.

The dependent variables  $\Delta\text{Deposits}_{i,t}$  and  $\text{DepositRate}_{i,t}$  represent the growth rate of deposits in bank  $i$  (the first difference of the log of bank deposits) at time  $t$  and total interest expenses paid on deposits to total deposits respectively.

$\text{BankRisk}_{i,t-k}$  is a vector of bank risk characteristics and these are included in the regression with a lag to account for the fact that financial statements are made available to the public with a certain delay and to mitigate potential endogeneity problems.  $\text{Controls}_{i,t-k}$  is a vector of control variables. A positive estimate for  $\beta_1$  and a negative estimate for  $\beta_2$  indicate the existence of market discipline.

Typically, the vector of bank risk characteristics contains several measures which are related to the CAMEL rating and this includes the ratio of shareholders equity to total assets (capital adequacy), ratio of loan-loss provisions to total loans or total loans to total assets (asset quality), ratio of non-interest expenses to total assets (management quality), ratio of return on assets (earnings capability), and the ratio of cash to total assets (bank liquidity).

### III. The Data, Methodology and Analysis

To investigate the issue of market discipline, all listed Jordanian banks (17), Kuwaiti banks (8), Omani banks (6), and all listed Saudi banks (9) are considered for inclusion in the analysis. However, based on the availability of all the relevant data, our sample of banks includes a total of 12 Jordanian banks, 7 Kuwaiti banks, 7 Saudi banks, and 4 Omani banks. In other words, it can be argued that our sample of banks is a good representation of all local banks in the four countries.

As our earlier discussion implies, depositors can exercise market discipline on banks by withdrawing their deposits (quantity variable) from riskier banks and/or by requiring higher interest rates (price level). This research adopts both the quantity and price approaches. The specification of our empirical models takes the following reduced form equations:

$$\Delta\text{Deposits}_{i,t} = \alpha_1 + \beta_1 \text{BankRisk}_{i,t} + \gamma_1 \text{Control}_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$\text{DepositRate}_{i,t} = \alpha_2 + \beta_2 \text{BankRisk}_{i,t} + \gamma_2 \text{Control}_{i,t} + \eta_{i,t} \quad (4)$$

where  $i = 1, \dots, N$  and  $t = 1, \dots, T$ , and  $N$  is the number of banks and  $T$  is the number of observations per bank.

The dependent variables  $\Delta\text{Deposits}_{i,t}$  and  $\text{DepositRate}_{i,t}$  are the growth rate of deposits in bank  $i$  (the first difference of the log of bank deposits) at time  $t$  and total interest expenses paid on deposits to total deposits respectively.

$\text{BankRisk}_{i,t}$  is a vector of bank risk characteristics and  $\text{Control}_{i,t}$  is a vector of control variable (bank size measured by the natural logarithm of total assets). A positive estimate for  $\beta_1$  and a negative estimate for  $\beta_2$  indicate the existence of market discipline.

The vector of bank risk characteristics includes the ratio of shareholders equity to total assets (capital adequacy), total loans to total assets (asset quality), ratio of non-interest expenses to total assets (management quality), ratio of return on assets (earnings capability), and the ratio of cash to total assets (bank liquidity). In addition, we add to models 3 and 4 a dummy variable to take into account the presence or otherwise of deposit insurance. In other words, this variable takes the value of 1 for the countries which have 100 percent deposit insurance (Saudi and Kuwaiti banks) and zero otherwise (Jordanian and Omani banks). Finally, we include in our analysis two macroeconomic variables: inflation rate and real GDP growth rate. These variables are included in the model to capture the effect of the macroeconomic environment on deposits growth and bank interest expense.

In Tables 1, 2, 3, and 4, we report some basic descriptive statistics for all the dependent and independent variables. It is interesting to note the ratios of cash and certificates of deposits to total assets (liquidity) and credit to total assets. While the overall mean value of cash and certificates of deposits to total assets equals 0.224 (Table 1), the value of this measure for the sample of Jordanian banks is 0.434 (Table 2). In other words, Jordanian banks hold proportionately more of their assets in terms of liquid cash.

Deposit is the growth rate of bank deposits in bank (the first difference of the log of bank deposits), interest is interest expenses paid on deposits to total deposits, credit is total loans to total assets (asset quality), capital is ratio of shareholders equity to total assets (capital adequacy), expense is the ratio of non-interest expenses to total assets (management quality), profit is the ratio of return on assets (earnings capability), liquidity is the ratio of cash and certificates of deposits to total assets (bank liquidity) and size is the natural log of bank dollar total assets.

This comparison can be more easily seen in Table 4. In this Table, it is reported that the mean value of cash to total assets is 0.434 in Jordan, 0.074 in Kuwait, 0.049 in Oman, and 0.099 in Saudi Arabia. Similarly, while the overall mean value of credit to total assets (credit) is 0.456 (Table 1), this ratio is 0.399 in Jordan, 0.489 in Kuwait, 0.726 in Oman, and 0.462 in our sample of Saudi Arabian banks (Table 4). In other words, Jordanian banks provide less credit than their counterparts in the Gulf countries. Finally, the size of banks reflects some great variations. Indeed Saudi Arabia boasts the largest banks in terms of the size of dollar total assets (Table 4).



Deposit is the growth rate of bank deposits in bank (the first difference of the log of bank deposits), interest is interest expenses paid on deposits to total deposits, credit is total loans to total assets (asset quality), capital is ratio of shareholders equity to total assets (capital adequacy), expense is the ratio of non-interest expenses to total assets (management quality), profit is the ratio of return on assets (earnings capability), and liquidity is the ratio of cash and certificates of deposits to total assets (bank liquidity) and size is the natural log of bank dollar total assets.

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The estimation method that we use is Period Seemingly Unrelated Regression (SUR) – Pooled Estimated Generalized Least Squares (EGLS). This method corrects for both arbitrary period serial correlation and period heteroskedasticity between the residuals for a given cross-section. In estimating this specification (Period SUR), the method uses residuals obtained from first stage estimates to form an estimate of the error covariance matrix. In the second stage, a feasible GLS specification is estimated. The standard error and covariances are calculated with (panel-corrected) cross section weights (PCSE) to obtain robust estimate of the cross-section residual (contemporaneous) covariance matrix<sup>11</sup>.

The basic results are reported in Table 5. Based on the results of this Table, we can make the following observations. First, the ratio of total loans to total assets (credit) which is used as a proxy measure of asset quality has a positive and significant coefficient in both the deposit equation and interest equation. These observations indicate that depositors are willing to supply more funds to banks that lend more and hence banks with lower levels of asset quality. This result is in sharp contrast to the international evidence and obviously contradicts the presence of market discipline.

Second, the capital ratio (capital) enters with a negative and insignificant sign in the deposit equation and a positive and significant sign in the interest equation. This observation implies that depositors are not willing to supply deposits to better – capitalized banks. Third, the ratio of non-interest expenses to total assets (expense) suggests that depositors are not less willing to supply funds to less efficient banks. Again, this result is in sharp contrast to the international evidence. Fourth, the results suggest that banks with higher earnings capability (profit) has the largest coefficient and consistently significant. In other words, depositors are willing to supply funds (deposits) to more profitable banks and more profitable banks tend to incur lower levels of interest expenses. Fifth, the ratio of cash and certificates of deposits to total assets (liquidity) has a positive and insignificant sign in the deposit equation and a

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<sup>11</sup> Estimating the panel regression with lagged values of the dependent variables resulted in very similar results. In other words, the reported results are not likely to suffer from serious simultaneity bias problems.

positive and significant sign in the interest equation. This implies that banks with high liquidity demand fewer deposits. Finally, the deposit insurance system (Dummy) variable enters with insignificant signs in both equations and this indicates that depositors do not worry about their deposits; thus, they do not reduce their supply of deposits in banks (Jordanian and Omani) that do not have 100 percent deposit insurance. Based on the above, we can state that the results do not provide strong evidence that market discipline is at work in Jordanian, Omani, Kuwaiti, and Saudi banks. To shed some further light on these results, we re-estimate equation 3 and 4 for Jordanian banks only and for the Omani, Kuwaiti, and Saudi banks. The results of this analysis are presented in Table 6 below.

Based on these results (Table 6), one can conclude that only Jordanian depositors discipline banks. In more specific terms, one can see that the coefficients of capital, expense, profit, liquidity and size are significant, and have the expected signs. For example, the positive coefficient of capital (+0.145) implies that depositors are willing to supply funds (deposits) to better-capitalized banks. Similarly, the ratio of non-interest expenses to total assets (expense) enters with a negative sign and this indicates that depositors are willing to supply funds to more efficient banks. In addition, it is interesting to note that the coefficient of liquidity is negative and significant. Clearly, this observation implies that more liquid (less risky) banks attract higher growth rates in their respective deposits. Finally, the results indicate that more profitable banks (the coefficient of profit is equal to +0.307) attract higher growth rates in their deposits.

#### **IV. Summary and Conclusion**

It is common knowledge that there is great disparity in the standard of living between nations. For centuries, economists have tried to understand why some countries are poor, while others are rich and why some countries have healthy and growing economies, while others stagnate at low levels of output. This effort led to the publication of numerous theoretical and empirical papers. Indeed the literature has examined the impact of many factors as possible determinants of economic growth. These include human capital, economic policies, macroeconomic conditions, openness to trade, foreign direct investment (FDI), political factors, socio-cultural factors, geography, demographic trends, institutional framework, and financial development.

Given the economic importance of financial intermediaries (banks) and the fact that the economic costs of bank failures are greater than those of other types of businesses, it is not surprising that banking research has examined a myriad of issues concerning their performance, including market discipline. Market discipline relies on private sector agents (equity holders and debt holders) in the production of information that is useful for bank supervisors in recognizing potential banking problems and in implementing remedial measures. In other words, as banks undertake greater risk levels, depositors, for example, may “penalize” (discipline) riskier banks by requiring higher interest rates or by withdrawing their deposits.

The issue of market discipline is important because of its potential social benefits. First, by penalizing banks for excessive risk-taking, market discipline can reduce the moral hazard incentives, when provided government guarantees allow banks to undertake excessive risk. Second, market discipline can improve the efficiency of banks. And finally, the social cost of supervising banks is expected to be reduced when market participants share some of the responsibility (with central banks) in monitoring banks’ performance.

The primary objective of this research is to provide answers to two basic questions. First, do depositors discipline Jordanian, Kuwaiti, Omani, and Saudi banks? Second, does the deposit

insurance design have any bearing on market discipline – does it differ for depositors that for example Kuwaiti and Saudi deposits are 100 percent insured explicitly and implicitly respectively, while the Jordanian and Omani deposits are insured up to \$14,000 and \$50,000 respectively? It is useful to provide answers to these two questions for a number of reasons. So far, published research papers which examined various issues that involve Arab banks did not consider bank discipline. Indeed the published works examined the impact of financial development on economic growth, the determinants of financial development, bank competition, bank efficiency, the determinants of net interest margin, and the determinants of banks' accounting performance. In addition, it can be argued that the fact that the size of banks in the Jordanian, Omani, Kuwaiti, and Saudi economies is large, it is important to investigate the issue of market discipline in this environment. Finally the fact that the deposit insurance system in these four countries is different, which provides us with an opportunity to investigate the impact, if any, of deposit insurance on market discipline.

This paper examines the issue of market discipline and the effect of explicit deposit insurance in the Jordanian, Omani, Kuwaiti, and Saudi scene. Based on a total of 30 banks and the time period 1998 – 2006, the results indicate the absence of a strong link between bank fundamentals and the supply of deposits. In addition, the evidence clearly shows that the difference between the deposit insurance system that prevails in Jordan and Oman and Kuwait and Saudi Arabia has no significant impact on market discipline. Finally, the results indicate a strong link between bank fundamentals and the supply of deposits in the Jordanian case. In other words, based on the presented evidence, we can argue that in Jordan only, depositors discipline banks. This conclusion may be due to many reasons. However, it can be argued that the absence of 100 percent deposit insurance like those which prevail in the Kuwaiti and Saudi banking systems might be one of them.

Market discipline and traditional banking supervision complement each other. For example, the market and the supervision authority (central bank) may have different information and these sources complement each other. Similarly, the information disclosure itself is not independent of the existing regulations and the quality of this information is also significant for market discipline. In addition, the market can enhance the supervision process when it detects weaknesses in the banking sector and makes it widely known. Having said that, it is useful to note that a few prerequisites need to be in place for effective market discipline to exist. First, market discipline relies on useful and timely information. In more specific terms, the accurate and timely information must be acted upon by investors (bank shareholders) in a rational manner. In other words, if the stock market prices listed stocks in an efficient manner, this efficiency level (pricing) would enhance market discipline. Second, all countries must make banks seek a credit rating and to make such ratings known to the public. This policy would ensure that an outside and independent body which is skilled in risk analysis provides an objective opinion regarding the risks of banks.

Based on the results of this paper, a number of future research issues can be recommended. For example, one can examine the impact of foreign bank entry on the performance of banks in terms of the annual change in their deposits. Similarly, the impact of the issue of governance on market discipline can also be examined.

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**Table 1: Basic Descriptive Statistics (All Samples)**

Variable	Mean	Median	Minimum	Maximum	Std. Deviation
Deposit	0.048	0.039	-0.137	0.297	0.059
Interest	0.047	0.044	0.011	0.119	0.024
Credit	0.456	0.446	0.192	0.832	0.140
Capital	0.062	0.052	0.006	0.299	0.040
Expense	0.021	0.018	0.001	0.126	0.012
Profit	0.018	0.018	-0.070	0.062	0.013
Liquidity	0.224	0.149	0.0050	0.768	0.197
Size	9.679	9.428	7.882	11.622	0.935
Inflation	1.576	1.300	-1.300	6.300	1.679
GDP	4.520	4.900	-8.640	13.400	3.743

**Table 2: Basic Descriptive Statistics (Jordanian Sample of Banks)**

Variable	Mean	Median	Minimum	Maximum	Std. Deviation
Deposit	0.048	0.037	-0.137	0.296	0.061
Interest	0.048	0.043	0.108	0.011	0.023
Credit	0.399	0.396	0.751	0.192	0.097
Capital	0.068	0.056	0.299	0.006	0.056
Expense	0.026	0.025	0.054	0.002	0.010
Profit	0.015	0.013	0.059	-0.027	0.014
Liquidity	0.434	0.430	0.768	0.191	0.113
Size	8.987	8.943	10.420	7.882	0.554

**Table 3 : Basic Descriptive Statistics (Gulf Sample of Banks)**

Variable	Mean	Median	Minimum	Maximum	Std. Deviation
Deposit	0.049	0.042	-0.112	0.298	0.057
Interest	0.047	0.044	0.011	0.119	0.023
Credit	0.535	0.510	0.832	0.298	0.138
Capital	0.057	0.051	0.132	0.025	0.023
Expense	0.017	0.015	0.001	0.126	0.012
Profit	0.019	0.020	-0.070	0.062	0.012
Liquidity	0.077	0.051	0.005	0.317	0.006
Size	10.162	9.808	8.800	11.621	0.839

**Table 4: Basic Individual Country Statistics (Means)**

Variable	Jordan	Kuwait	Oman	Saudi Arabia
Deposit	0.048	0.041	0.053	0.055
Interest	0.048	0.058	0.043	0.037
Credit	0.399	0.489	0.726	0.462
Capital	0.068	0.054	0.072	0.050
Expense	0.026	0.011	0.029	0.015
Profit	0.015	0.019	0.015	0.023
Liquidity	0.434	0.074	0.049	0.099
Size	8.987	9.751	9.299	11.179



**Table 5: The Basic Econometric (Overall) Results**

Variable	Deposit Growth		Interest Expense	
	Coefficient	Coefficient	Coefficient	Coefficient
Credit	0.080 (3.055*)	0.080 (2.533*)	0.033 (3.385*)	0.039 (3.949*)
Capital	-0.012 (-0.129)	-0.011 (-0.124)	0.113 (2.934*)	0.108 (2.817*)
Expense	-0.237 (-0.627)	-0.241 (-0.633)	-0.594 (-6.330*)	-0.572 (-5.844*)
Profit	0.765 (2.362*)	0.767 (2.385*)	-0.665 (-8.639*)	-0.655 (-8.321*)
Liquidity	0.012 (0.587)	0.012 (0.401)	0.032 (4.499*)	0.041 (4.647*)
Size	-0.001 (-0.038)	-0.001 (-0.026)	0.004 (8.225*)	0.003 (4.465*)
Dummy	-----	0.001 (0.546)	-----	0.006 (1.455)
Adj. R <sup>2</sup>	0.337	0.337	0.646	0.672
F-statistic	28.184*	23.638*	99.035*	92.653*
D-W Statistic	1.996	1.966	1.868	1.881

Note: When we included interest rate and real GDP growth in the model, the results did not change. Moreover, the coefficients of these variables are extremely low and not significant. This is also true in the results reported in Table 6 below.

**Table 6: The Basic Econometric (Jordanian and Gulf) Results**

Variable	Jordanian Banks		Gulf Banks	
	Deposit	Interest	Deposit	Interest
Credit	0.183 (7.685*)	0.089 (8.092*)	0.100 (4.064*)	0.012 (1.303)
Capital	0.145 (2.596*)	0.027 (0.805)	-0.397 (-2.855*)	0.298 (5.755*)
Expense	-0.775 (-3.050*)	-0.617 (-6.217*)	-0.283 (-0.639)	-0.683 (-6.503)
Profit	0.307* (2.411)	-0.669 (-13.058*)	0.110 (0.263)	-0.836 (-8.941*)
Liquidity	-0.141 (-5.380*)	0.053 (5.597*)	0.073 (1.407)	0.002 (-0.187)
Size	0.004 (2.455*)	0.001 (1.907**)	0.001 (1.059)	0.005 (8.941*)
Adj. R <sup>2</sup>	0.824	0.895	0.487	0.782
F-statistic	101.638*	184.170*	31.381	116.102
D-W Statistic	1.953	1.895	1.995	1.887