

Savings and Development



"GIORDANO DELL' AMORE" FOUNDATION

A Centre for Financial Growth and Development Assistance

established by

Fondazione Cassa di Risparmio delle Provincie Lombarde



Quarterly Review - No. 4 - 2003 - XXVII

Spedizione in abbonamento postale al 70% - Filiale di Milano



Savings and Development

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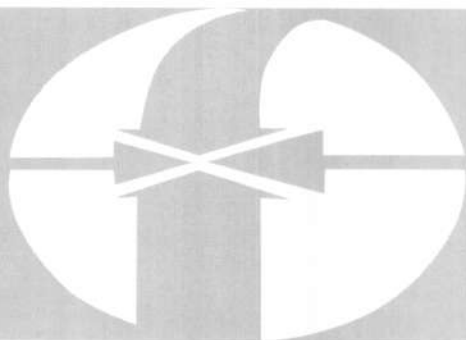
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Milan - Italy

Quarterly Review - No. 4 - 2003 - XXVII

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AN EMPIRICAL ANALYSIS OF THE IMPACT OF FULL DEPOSIT INSURANCE AND INSTABLE CONDITIONS ON COMMERCIAL BANKS: THE TURKISH CASE

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1. Introduction

In an earlier study published in this Journal (Civelek, 1987), it was argued that the Turkish commercial banks stood out as highly fragile and vulnerable financial institutions. This argument was put forth on the basis of a premise of empirical nature which pointed out that the empirically measured degree of the liquidity of the aggregate asset portfolio of the banks was insufficiently low, which would not permit to maintain the confidence of the depositors¹. Moreover, this argument was further supported by an observable fact that the banks, over the years, have established close ties with the firms operating in the real sectors of the economy. Such ties immensely increased the banks' sensitivity to external shocks against which they lacked the required expertise and experience to formulate effective defensive strategies.

Considering econometric and methodological limitations, the aforementioned study did not make any further attempt to expose fully on the possible consequences of the fragility and vulnerability argument for the banks and the economy. However, the dramatic financial events happened in the Turkish economy and the Turkish commercial banking system since the beginning of 1990's can be viewed as the inevitable consequences created by the factors among which the issue of the fragility and vulnerability of the banking system can be singled out as the prime contributor, if not as the principal initiator². To reinforce or to develop a better insight into such view, the difficulties faced by the economy and the banking system during the recent decade require an explanation stressing on the notion of the globalization process.

In fact, during the period starting from the late 1980's up to the present the Turkish economy has been under distractive pressures from two main sources: 1) The globalization process. This ongoing process, which has radically been shaping the global economy, has been creating unfavorable conditions for the Turkish economy and for all of the other developing countries, as well³. 2) The prevailing domestic instable eco-

¹ The liquidity measurement was carried out within the conceptual framework laid down by the constant elasticity of substitution (CES) utility function.

² The fragility and vulnerability problem is a complex problem since it embodies the accumulated effects of a wide variety of such factors which range from excessive risk taking, amassing assets with low degrees of liquidity, abuse of bank resources by bank owners/managers to leniency shown by supervisory/regulatory authorities regarding to unconventional, imprudent banking activities.

³ For a detailed discussion see Hurrell and Woods (2000).

nomic, political, social conditions in the system which were further deteriorated by the negative impacts of the globalization process. The combined effects of these two sources have produced undesirable changes in such vitally important indicators of economic well-being of the nation as high rates of inflation, interest rates, size of hidden (unofficial) economy, government budget deficit, trade balance deficit, foreign exchange rates, unemployment rates. Their numerical values have shown ever worsening trends to reach their most possible undesirable levels which have increased the degree of instability and uncertainty not only in the economy but also in the banks' operational environment.

During this period, the banks have had to work in an operational environment whose conditions would surely be detrimental to their primary function in the economy as financial intermediaries. Inevitably, such conditions violently shocked the very foundation upon which the banks had based their conventional banking activities, practices and strategies. Consequently the Turkish commercial banks, as a whole, faced with serious problems, particularly in 1994 and in 1999. Had the government, in 1994, not acted promptly to declare full insurance to all bank deposits, the occurrence of bank runs and consequently full-fledged financial panic would have been inevitable. In December 1999 a similar financial panic leading to the collapse of the financial system was also prevented by the Government restating that the full deposit insurance provision for all bank deposits would be maintained.

The most notable consequence of these dramatic events was the unprecedented number of bank failures, closures and takeovers⁴. On the basis of such consequence, the following arguments can be advanced:

- 1) Any delay / neglect of taking prompt corrective actions by the bank management and supervisory / regulatory authorities to deal with the bank fragility and vulnerability problem can easily develop into serious financial crisis and consequently lead to even much more serious economic, political and social disturbances in the system.
- 2) The full deposit insurance guarantee provided by the government to give assurance to bank depositors about safety of their money implies that the financially fragile and vulnerable banks have lost their capability to device effective internal control

⁴ The number during the period 1994-2001 totaled to 25.

systems and protective shields to maintain such confidence.

- 3) The commercial banking system should radically be reorganized in such a way to meet the requirements of the economy which has been constantly witnessing structural changes induced by the ongoing globalization process.

The remainder of this paper is organized as follows: Section 1 describes the conceptual framework and the formulated hypotheses of the study. Research methodology is presented in Section 2. Section 3 provides empirical results and their interpretation and implications. Concluding comments are presented in Section 4.

2. Conceptual Framework and Hypotheses

To establish the conceptual framework within which the hypothesis of the study will be formulated, the following points are of particular importance:

- 1) Since commercial banks are highly leveraged institutions, the composition of the assets in their portfolio should be formed by respecting the most basic commercial banking rule of establishing an optimal balance between the risk/return/liquidity elements. Such balance from the viewpoints of the banks is the most essential ingredient in a) maintaining depositors' confidence and viability of the banking system, and b) remaining in a legal context whose boundaries are determined by the conventional banking practices and the regulatory / supervisory authorities.
- 2) Banks derive their major portion of their profits from the items which represent their lending and investment activities.
- 3) Instable economic, political and social conditions, by creating a highly volatile operational environment, induce commercial banks to behave aggressively by taking unconventionally high risks in their lending and investing activities. The government's provision of full deposit guarantee under such conditions becomes an additional factor to encourage the banks to pursue unconventionally risky lending and investing strategies⁵.
- 4) As stated in the literature, the full deposit insurance provision create two major problems: the moral hazard problem which implies the increased propensity of the

⁵ It can be conceived as the provision of an additional opportunity, particularly for the banks in deep financial troubles, to "gamble for resurrection".

insured to take excessive risks and the forbearance problem which refers to the observable laxity, negligence in behavior of regulatory and supervisory authorities in fulfilling their duties, and an openness to political pressures.

- 5) The provision of full deposit insurance also affects depositors' behavior by eliminating their need for making a distinction between financially healthy and distressed banks. Consequently, depositors under full insurance coverage incautiously channel their funds with the intent of increasing their interest income to those banks offering higher interest rates⁶. Such higher interest rates on deposits inevitably trigger an intense competition among the banks which eventually threatens the health of financially sound banks⁷.

2.1 General Hypothesis

The above mentioned points, as a whole, establish a sound foundation upon which the conceptual framework of the study is based. Within the context of this framework, the general hypothesis of the study is stated as follows. The full insurance guarantee provided by the government and instable economic, political and social conditions besetting the macroeconomic setting, as a whole, increase the aggressiveness of the commercial banks in their lending and investment activities and encourage them to disrespect the most basic banking rule of maintaining an optimal balance between liquidity, risk and profitability elements in their asset portfolios.

It should be noted that this general hypothesis is not operational, i.e., it cannot directly be tested against the actual data. This hypothesis, therefore, has to be transformed into the empirically testable form, by assuming that such aggressive behavior and negligence of maintaining the optimal balance can empirically be detected by formulating a model of bank portfolio behavior.

2.2 Operational Hypothesis

Consequently, the operational hypothesis of the study is formulated in question

⁶ In general financially distressed banks initiate higher interest rates on deposits to attract funds.

⁷ High interest rates imply not only higher cost of funds to the banks but also to the demanders of bank funds in the forms of higher lending and investing rates.

form as follows: under the full deposit insurance protection scheme and instable conditions, can holdings of bank items, which represent lending and investment activities of the Turkish commercial banks, be explained within the context of the theoretically and empirically specified economic variables?

If the test results lead to a negative empirical answer, it, within the study's conceptual framework, can conveniently be interpreted to suggest that the full insurance guarantee and instable conditions induce the banks to act aggressively in their lending and investing activities to disrespect the most basic banking rule of maintaining an optimal balance between liquidity, risk and profitability elements in their asset portfolios. On the other hand, in the case of a positive empirical answer, the contrary suggestion can be advanced.

2.3 Supplementary Hypothesis

With respect to the banks' holdings of items in the liability side of the balance sheet equation, another research questions similar to the one in the operational hypothesis can be raised as follows: Are holdings of bank items which represent claims of suppliers of bank funds, excluding owners (i.e., bank deposits and borrowings) susceptible to the theoretical modeling, during a period of full deposit insurance protection scheme and instable conditions?

If the test results provide a negative answer to the above stated issue, the interpretation is to be made by focusing on the effects of the full insurance provision upon weakening the link between the financial strength of the banks and the flows of funds and on the diminished concern for default risk by the insured banks and creditors due to the bailing out policies formulated by the government. A positive answer, on the other hand, requires contrary suggestions.

3. Research Methodology

In order to provide empirical answers to the research questions raised in the hypotheses, the content of this section is systematically divided into 3 subsections which are entitled accounting preliminaries, a model for bank portfolio behavior, data and list of variables, respectively.

3.1 Accounting Preliminaries

The principal assets and liabilities listed in the consolidated balance sheet of the Turkish commercial banks can also be presented as an equation which is widely known as the basic balance sheet identity. Such equation can be rearranged to reflect the banks' most vital function in the economy, i.e., the financial intermediation role which positions them between the demanders for and suppliers of bank funds. The rearranged equation for the Turkish commercial banks is given below as follows:

$$C + ODOF + BI_A = CSOF + BI_L \quad (1)$$

where:

C: Vault Cash

ODOF: Obligations of demanders of funds

$$ODOF = SP + TL + EP$$

SP: Securities Portfolio

TL: Total Loans

EP: Equity Participation

BI_A: Balancing (remaining) Items of Assets

CSOF: Claims of Suppliers of Funds

$$CSOF = DEP + BOR + SHE$$

DEP: Claims of depositors which consists of demand deposits and time deposits

BOR: Claims of other creditors which includes non deposit funds that are borrowed funds from the Central banks, other banks, abroad and others, inter-bank funds, borrowed, securities, other liabilities

SHE: Claims of shareholders; share capital, reserves and revaluation fund

BI_L: Balancing (remaining) Items of Liabilities

All of the information cited above can be utilized to rewrite the following basic balance sheet equation for the Turkish commercial banks as follows:

$$C + SP + TL + EP + BI_A = DEP + BOR + SHE + BI_L \quad (2)$$

It should be noted that equation (2) explicitly exposes those items (i.e., SP, TL, EP, DEP and BOR) for which empirical investigations will be carried to determine whether variations in their observed values are explainable within the context of a theoretically specified model.

3.2 A Model for Bank Portfolio Behavior

To test the operational hypothesis of the study, the stock adjustment model, one of the well-known empirical tools in the economics literature is adopted to investigate the portfolio behavior of the Turkish commercial banks. Within the conceptual framework of the model, the actual holdings of a bank portfolio item in the current period can be explained in terms of its actual holdings in the previous period plus some portion of discrepancy between desired holdings in the current period and actual holdings in the previous period.

Alternatively, the stock adjustment model can be expressed in notations as follows:

$$X_{i,t} = X_{i,t-1} + \alpha_i (X_{i,t}^* - X_{i,t-1}) \quad (3)$$

where

$X_{i,t}$ = The actual holdings of the i^{th} portfolio item in period t

$X_{i,t-1}$ = The actual holdings of the i^{th} portfolio item in period $t-1$

$X_{i,t}^*$ = The desired holdings of the i^{th} portfolio item in period t

α_i = The adjustment coefficient

It should be pointed out that equation (3) is non-operational as it stands since $X_{i,t}^*$ is not directly observable. On the other hand, it is rather plausible to assume that there is a functional relationship between $X_{i,t}^*$ and some observable variables. Thus, equation (3) can easily be converted into the testable form by postulating that the desired holdings of a portfolio item i , at time t , is a linear function of wealth of the entity demanding the i^{th} portfolio item, the expected holding period return on the item, r_{it} , and the expected holding period returns on other alternative items⁸. That is,

$$X_{i,t}^* = f(W_t, r_{1t}, r_{2t}, \dots, r_{it}, \dots, r_{nt}) \quad (4)$$

⁸ The conventional theory of demand states that the demand for any particular asset can be specified in terms of these three fundamental economic variables: wealth held in various forms, the analogue of the budget constraints, the price or return on the asset and the prices or returns on all alternative assets. For more discussion see Friedman (1966, pp. 67-69). This statement provided a sound theoretical base for the specification of $X_{i,t}^*$.

where r 's with the subscripts indicate the expected holding period returns on the portfolio items. On the other hand, W_t , the wealth variable can be expressed as:

$$W_t = (SHE_{t-1} + Y_t) \quad (5)$$

where Y_t represents net income in the current year.

For simplicity, utilizing only two interest rates r_i and r_{Ai} (an average rate on alternative items) equation (4) can be expressed as:

$$X_{i,t}^* = \beta_{i,0} + \beta_{i,1}W_{i,t} + \beta_{i,2}r_{i,t} + \beta_{i,3}r_{Ai,t} \quad (6)$$

and substituting equation (6) into equation (3) gives:

$$X_{i,t} = X_{i,t-1} + \alpha_i (\beta_{i,0} + \beta_{i,1}W_{i,t} + \beta_{i,2}r_{i,t} + \beta_{i,3}r_{Ai,t} - X_{i,t-1}) \quad (7)$$

By multiplying the terms in parenthesis by α_i and adding the error term e , the following testable model is obtained:

$$X_{i,t} = a_i + b_i W_{i,t} + c_i r_{i,t} + d_i r_{Ai,t} + f_i X_{i,t-1} + e_t \quad (8)$$

where $a_i = \alpha_i \beta_{i,0}$, $b_i = \alpha_i \beta_{i,1}$, $c_i = \alpha_i \beta_{i,2}$, $d_i = \alpha_i \beta_{i,3}$, and $f_i = (1 - \alpha_i)$, $[0 \leq f \leq 1]$.

The examination of the properties of equation (8) is in order.

- i. The model is based on conventional theory of demand and is quite similar to the one originally proposed by Brainard and Tobin (1968).
- ii. The model provides a dynamic conceptual setting to analyze holdings of bank items.
- iii. The model imposes rigid restrictions on the testing process. That is, the freedom of the researchers regarding adding new variables to, or deleting the existing variables in the equation to achieve better statistical results virtually does not exist.
- iv. α_i (one minus the coefficient of the lagged dependent variable) is interpreted as a measure of the speed with which banks adjust their holdings of i^{th} item to changes in the explanatory variables during the period of observation. Since α_i in equation

(3) is positive and takes a value between zero and one, f_i , the coefficient of the lagged dependent variable in equation (8), is also positive and takes a value between zero and one. If there is a complete adjustment to equilibrium over the time period being considered, f_i will take a value of zero. On the other hand, if f_i equals one, there will be no adjustment to equilibrium over the given period of time.

- v. Within the theoretical context of the model the following relationships are assumed to hold between the dependent variable ($X_{i,t}$) and each of the explanatory variables included in equation (8).

For items in the asset category:

$$\frac{\partial X_{i,t}}{\partial W_{i,t}} > 0 \quad \frac{\partial X_{i,t}}{\partial X_{i,t-1}} > 0 \quad \frac{\partial X_{i,t}}{\partial r_{i,t}} > 0 \quad \frac{\partial X_{i,t}}{\partial r_{Ai,t}} < 0$$

For items in the liability category:

$$\frac{\partial X_{i,t}}{\partial W_{i,t}} > 0 \quad \frac{\partial X_{i,t}}{\partial X_{i,t-1}} > 0 \quad \frac{\partial X_{i,t}}{\partial r_{i,t}} < 0 \quad \frac{\partial X_{i,t}}{\partial r_{Ai,t}} > 0$$

3.3 Data and List of Variables

The data required to test the adopted model for the Turkish Commercial Banking (TCB) system and bank groups are obtained from the Banks Association of Turkey website (www.tbb.org.tr/english/asp/periodicals.asp). The quarterly time series data for the variables listed below are collected for the study period 1992:4 – 2001:4 which encompasses 37 quarterly observations. It should be noted that the site provides banking data in terms of both U.S. dollars (US \$) and Turkish Liras (TL)⁹. The study preferred to employ the data in US \$ because of this practical reason of convenience: The (TL/US \$) exchange rate used in the conversion of the TL amounts into US \$ amounts functions as a deflator, similar to the price deflator used in calculating data in real values. The availability of the data in US \$ makes the task of cal-

⁹ Recently banking data in Euros (€) is also available on the site.

culating real values stated in TL amounts unnecessary¹⁰.

List of Variables

a. DEPENDENT VARIABLES (X_t)

SP_t , TL_t , EP_t , DEP_t , and BOR_t

b. INDEPENDENT VARIABLES

Budget Variable:

$W_t (= SHE_{t-1} + Y_t)$

Lagged dependent Variables:

SP_{t-1} , TL_{t-1} , EP_{t-1} , DEP_{t-1} , and BOR_{t-1}

Own Rate Variables:

r_{SP} , r_{TL} , r_{EP} , r_{DEP} , and r_{BOR}

Average Rate on Alternative Items¹¹:

r_{ASP} , r_{ATL} , r_{AEP} , r_{ADEP} , and r_{ABOR}

4. Estimation: Empirical Results

Testing the formulated hypothesis of the study simply requires the determination of whether or not the banks holdings of major items in the asset and liability categories of their basic balance sheet equation (i.e., SP, TL, EP, DEP, BOR) can be explained within the empirical grounds of the adopted model (equation 8). In the testing procedure, these steps are followed: First, equation (8) is transformed into natural log-linear form as below:

$$\ln X_{i,t} = a_i + b_i \ln W_{i,t} + c_i \ln r_{i,t} + d_i \ln r_{A,i,t} + f_i \ln X_{i,t-1} + e_t$$

Second, this model is fit to the quarterly data for the period 1992:4 – 2001:4 by employing ordinary least squares (OLS) technique. The regression results obtained for

¹⁰ It should be underlined that the study period is characterized as the inflationary period which necessitates the use of the data in real values in empirical investigations to remove the undesirable effects of abnormal price level increases.

¹¹ For the SP equation, $r_{ASP} = (r_{TL} + r_{EQP}) / 2$; for the TL equation, $r_{ATL} = (r_{SP} + r_{EQP}) / 2$; for the EQP equation, $r_{AEQP} = (r_{SP} + r_{TL}) / 2$; for the DEP equation, $r_{ADEP} = r_{BOR}$; and for the BOR equation, $r_{ABOR} = r_{DEP}$.

the model are presented in Table 1¹². Third, to evaluate the estimated regression results, the performance evaluation criteria are established in terms of the theoretical properties and expectations of the stock adjustment model, and of such summary statistics as t values (the number in the parenthesis below the estimated regression coefficients), R^2 (goodness of fit), F values and Durbin- Watson (D-W) statistic¹³.

Based on a critical evaluation of the empirical results presented in Table 1, the following variable - based comments can be made:

The lagged dependent variable ($X_{i,t}$). It should be once more noted that since $\alpha_{i,t}$, the speed of adjustment coefficient in equation (3), is positive and takes a value between zero and 1 ($0 \leq \alpha_{i,t} \leq 1$), the estimated coefficient of the lagged dependent variable in the model, f_i , is also positive and takes a value between zero and one ($0 \leq f_i \leq 1$). Regarding to the relation between $\alpha_{i,t}$ and f_i , the following cases are possible:

a. If $f_i = 0$, then $\alpha_{i,t} = 1$. This case refers to the complete adjustment of holdings of $X_{i,t}$ to changes in the budget and interest rate variables over the time period being considered, i.e., one-quarter.

b. If $f_i = 1$, then $\alpha_{i,t} = 0$. This case, on the other hand, implies that there is no adjustment over the given period of time.

Consequently, the estimated coefficient of the lagged dependent variable (f_i) is expected to lie within the hypothesized range and must be statistically significant. As noticed, in all equations in Table 1, the estimated coefficients remain within the hypothesized range and are statistically significant at the 1% level. As a result, the speed of adjustment coefficients in all estimated equations meet a priori expectation.

As far as the problem of how rapidly banks' holdings of $X_{i,t}$ react to changes in the $W_{i,t}$, $r_{i,t}$, $r_{A,i,t}$ variables within one quarter, the following observations on the estimated $\alpha_{i,t}$ values are made:

¹² Variables measured (natural) logarithmically directly provide one-quarter elasticities.

¹³ It is instructive to note that when the lagged value of the dependent variable is included in an equation, the Durbin-Watson statistic should be interpreted as a rough measure of the presence or absence of serial correlation because "it is very badly biased" (Griliches, 1967, pp. 16-49). Therefore, no attempt is made to evaluate the D-W statistics.

Table 1: Regression Results

Table 1. Regression results

Dependent Variable		Constant	Explanatory Variables				Summary Statistics		
In _{X_{i,t}}			In X _{i,t-1}	In (W _t)	Inr _{i,t}	Inr _{Ai,t}	R ²	F	D-W
ALL BANKS									
1	InSP	2.149 (2.056)	0.700*** (7.333)	0.091 (0.817)	-0.181* (1.735)	0.257** (2.167)	0.804	30.832	2.339
2	InTL	2.837 (3.069)	0.718*** (6.325)	0.020 (0.263)	-0.115 (1.548)	0.196*** (3.211)	0.877	53.658	1.488
3	InEP	0.809 (0.458)	0.886*** (8.413)	0.005 (0.031)	-0.014 (0.180)	0.094 (0.749)	0.791	28.320	1.482
4	InDEP	1.775 (2.448)	0.943*** (14.418)	-0.109 (1.323)	0.208*** (2.920)	-0.073 (1.266)	0.915	81.030	2.470
5	InBOR	0.445 (0.598)	0.954*** (12.582)	-0.024 (0.286)	-0.134** (2.102)	0.104 (1.402)	0.879	54.449	1.356
PRIVATE OWNED BANKS									
6	InSP	2.394 (2.973)	0.941*** (5.518)	-0.187 (1.123)	-0.122 (1.060)	0.256** (2.171)	0.855	45.835	1.999
7	InTL	3.387 (5.009)	0.489*** (3.893)	0.193** (2.089)	-0.175*** (2.890)	0.248*** (4.116)	0.929	101.142	1.895
8	InEP	-1.368 (0.999)	0.746*** (6.374)	0.336* (1.897)	-0.236* (1.794)	0.235* (1.711)	0.798	30.691	1.518
9	InDEP	0.676 (0.794)	1.051*** (6.103)	-0.098 (0.751)	0.185 (1.429)	-0.032 (0.287)	0.886	60.477	2.652
10	InBOR	-0.300 (0.462)	0.949*** (9.438)	0.070 (1.144)	-0.379*** (3.795)	0.426*** (3.670)	0.901	70.694	1.896
STATE OWNED BANKS									
11	InSP	4.370 (3.157)	0.552*** (3.150)	-0.099* (1.721)	-0.277** (2.674)	0.234* (1.758)	0.329	3.678	2.200
12	InTL	1.003 (0.934)	0.907*** (7.314)	0.012 (0.496)	0.133* (1.790)	0.042 (1.000)	0.690	16.697	1.474
13	InEP	2.418 (3.255)	0.442*** (2.901)	0.002 (0.041)	-0.203** (2.487)	0.188 (1.532)	0.693	16.371	1.819
14	InDEP	3.206 (2.417)	0.667*** (4.789)	0.029 (0.831)	0.167** (2.199)	-0.051 (1.499)	0.853	27.508	2.036
15	InBOR	2.017 (1.710)	0.702*** (5.212)	0.075** (2.239)	-2.955 (1.282)	0.004 (0.063)	0.712	11.740	1.718
FOREIGN BANKS									
16	InSP	-2.377 (1.501)	0.589*** (3.575)	0.698** (2.185)	-0.328** (2.697)	-0.067 (0.814)	0.753	22.097	2.260
17	InTL	0.706 (1.027)	0.693*** (5.685)	0.188 (1.365)	-0.121** (2.105)	0.0296 (0.803)	0.856	42.974	2.183
18	InEP	-2.659 (1.230)	0.527*** (4.766)	0.500 (1.543)	-0.034 (0.594)	-0.272* (1.886)	0.571	9.311	2.154
19	InDEP	0.155 (0.184)	0.777*** (6.375)	0.243 (1.222)	0.106 (1.038)	-0.052 (0.614)	0.893	64.912	2.176
20	InBOR	-2.819 (2.612)	0.609*** (4.388)	0.762*** (3.022)	-0.278*** (2.851)	0.008 (0.066)	0.887	60.650	2.038

*** Statistically significant at 1% level

** Statistically significant at 5% level

* Statistically significant at 10% level

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- i. With respect to the holdings of SP, TL and EP, one-quarter responses of the banking system are considered low since the $\alpha_{i,t}$ values for the holdings of SP, TL and EP are 0.300, 0.282 and 0.111, respectively. On the other hand, the $\alpha_{i,t}$ values of the banking system for the DEP (0.057) and BOR (0.046) holdings are, relatively, much more lower than those reported for SP, TL and EP. These values indicate that only a marginal portion of the gap between the banking system's actual holdings and desired holdings of DEP and BOR is bridged within the quarter.
 - ii. Within the bank groups, the comparatively highest $\alpha_{i,t}$ values for SP, TL and EP holdings are 0.511 (private owned banks), 0.558 (state owned banks), 0.473 (foreign banks), respectively. Regarding to the holdings of DEP and BOR, the highest $\alpha_{i,t}$ values are 0.333 (state owned banks), 0.391 (foreign banks), respectively. These values indicate that a) the bank groups' one quarter responses are relatively greater in case of their holdings of SP, TL and EP than those of DEP and BOR, and b) there is no systematic relationship between banks ownership status and the $\alpha_{i,t}$ value. That is, no banking group systematically and consistently registers relatively higher $\alpha_{i,t}$ values for holdings of these 5 types of bank items considered in the study.
 - iii. On the basis of the comparison of the equations with the highest and the lowest R^2 values on one hand, and the equations with the highest and lowest $\alpha_{i,t}$ values, on the other, it is inferred that there is not any systematic relationship between the values of R^2 and $\alpha_{i,t}$.

The budget variable (W_t). Particularly, it should be noted that the W_t variable in all equations estimated for the banking system performs poorly. In all 5 cases it appears to be statistically insignificant. Moreover, in equations 4 and 5, it carries wrong signs.

In case of the 15 equations estimated for the bank groups it is found that only in 5 equations (equations 7 and 8: private owned banks, equation 15: state owned banks and equations 16 and 20: foreign banks) the W_t variable has the anticipated positive sign and statistical significance. In the remaining equations, the W_t variable appears to be statistically insignificant. In 3 cases, it has also the wrong sign (equations 6, 9 and 11). Consequently, it can be pointed out that these are unexpectedly poor results and they do not permit to affirm the existence of statistically acceptable relations between the holdings of bank items and equity funds.

The own rate ($r_{i,t}$). The own rate variable ($r_{i,t}$), within the demand function context, is anticipated to yield positive signs for items in the asset category and negative signs for the items in the liability category. Unfortunately, in all three equations estimated for the banking system's holdings of SP, TL and EP, the $r_{i,t}$ variable appears with a negative sign. On the other hand, for the liability category the $r_{i,t}$ variable appears in the BOR equation with the expected negative sign and statistical significance while in the DEP equation, it yields positive and statistically significant coefficient.

For the SP, TL and EP holdings, the $r_{i,t}$ variable yields the same negative sign pattern for all bank groups with one exception, equation 12. That is, the own rate variable, in the equations estimated for the bank groups, SP, TL and EP yield statistically significant but negative coefficients. As it is seen from the results obtained for the DEP holdings, the estimated $r_{i,t}$ coefficients for the bank groups, signwise, are not in confirmation with a priori expectations. As far as DEP holdings, within the theoretical context of the demand model, are concerned, negative (positive) sign indicates that an increase in the own rate (cost of funds) results in decreases (increases) in banks' holdings of deposits. From equation 9, 14 and 19, it can be observed that the $r_{i,t}$ variable in all the cases yields positive signs, two of which are not statistically significant. The persistent appearance of positive signs in all three cases can cautiously be interpreted to imply that banks nearly rely on deposits as the primary source of bank funds under the full deposit insurance protection scheme. On the other hand, $r_{i,t}$ variable in the estimated BOR equations yields coefficients with anticipated signs (equations 10, 15 and 20) and statistical significance (equation 10 and 20).

Average rate on alternative items ($r_{Ai,t}$). This rate is employed as a proxy to represent the average opportunity cost of holdings of $X_{i,t}$. In case of an item in the asset category, it is expected to yield a negative sign, which implies that an increase in the average rate on alternative items results in a decrease in holdings of that item. In the case of an item in the liability category, this rate is, however, expected to produce a positive sign, which indicates that an increase in the rate (i.e., the cost) of alternative items results in increases in the holdings of $X_{i,t}$.

A simple glance at the estimated coefficients of the $r_{Ai,t}$ variable suffices to indicate the following: i) in case of the SP, TL and EP holdings, the sign of the estimated coef-

ficients of the $r_{Ai,t}$ variable with the exception of two cases, equations 16 and 18, do not fulfill the expectations. Only in one case, however, the estimated coefficient has both the statistical significance and the correct sign (equation 18). ii) in case of the DEP and BOR, the estimated coefficients of the $r_{Ai,t}$ variable, as a whole, do not have plausible properties. More specifically, in case of the estimated DEP equations, $r_{Ai,t}$ consistently yields negative signs. None of its coefficients, however, is found statistically significant. On the other hand, the $r_{Ai,t}$ variable in all the estimated BOR equations appears to have the anticipated positive sign. However, only in one case, its coefficient has both the correct sign and the statistical significance (equation 10).

4.1 Implications of Empirical Results

Within the methodological setting of the study, the variable-based evaluation of the empirical results leads us to make this assertion: The SP, TL, EP, DEP and BOR holdings of the Turkish commercial banking system and the specified bank groups can not adequately be explained within the theoretical confines of the adopted model during a time period which has witnessed both the provision of full deposit insurance and the effect of instable economic, political and social conditions.

It should be noted that such an assertion has two important implications for the two research questions raised in the hypotheses. With respect to the first question, it is a negative answer which implies that under the full insurance guarantee and instable conditions, the commercial banks have acted aggressively in their lending and investing activities by disrespecting the most basic banking rule of maintaining an optimal balance between liquidity, risk and profitability elements in their asset portfolios. With respect to the second question, it is also a negative answer which implies the full insurance provisions and bailing out policies formulated by the government, by diminishing the concern for default risk, have induced the commercial banks to seek (external) funds aggressively and encouraged depositors (and creditors) to channel their funds to the banks incautiously.

5. Conclusion

To provide empirically acceptable answers to the research questions raised in the

hypotheses laid out in Section 1, the present study adopts a research strategy which exclusively relies on the regression results. Efforts, which so far have been made to evaluate the estimates presented in Table 1, should, as a whole, be viewed as an attempt to establish a sound empirical base for providing such answers. From this perspective, the approach taken in this study is essentially exploratory and practical, as well.

With respect to the holdings of bank items which represent banks' lending and investing activities (SP, TL, EP) and to those which are considered the major source of bank funds (DEP and BOR), the adopted model does not produce any convincing evidence to give a positive answer to each of the two research questions raised in the formulated hypothesis. Alternatively, it can, on the basis of the available empirical evidence provided in Table 1, be asserted that the banks' actual holdings of SP, TL, EP, DEP and BOR can not convincingly be explained in terms of the model's exogenously determined variables (i.e., W_t , interest rates) and the lagged value of the dependent variable.

It should be immediately noted that this assertion is made within the confines of empirical evidence which are obtained by utilizing the stock adjustment model which is in form of a single demand equation. From theoretical and empirical considerations, it can be indicated that variables included in any demand equation may be determined by the intersection of a supply schedule and a demand schedule. Except *under particular circumstances*, the independent estimation of the demand equation (and the supply equation) by employing OLS technique produces inconsistent estimates of parameters. That is, the formulated relationship cannot be estimated without bias. It is, therefore, quite possible that statistically poor empirical results presented in the study may be caused, in part, by the use of a single equation technique of estimation. This particular point forces us to stop momentarily to find out a safe ground to defend the use of the single demand equation in the study. Fortunately, the economics literature provide some expositions to justify the use of single equation estimates – instead of using the whole system of equations (including both demand and supply) – and to show that the bias introduced by considering the variables as given in the demand equation may not be too serious. They, as a whole, form the needed ground to justify the single demand equation in testing procedures.

The use of the single demand equation in the present study is formally justified as follows: i) By focusing on the previously mentioned term "*except under particular cir-*

cumstances," it is suggested that the banking sector's institutional characteristics – being an integral part and indispensable tool of the monetary policy pursued by the government, and being the investing public's concern – can conveniently be interpreted as "*particular circumstances*" to support the methodological procedure of the study. ii) Research efforts directed toward the specification of the supply function in order to eliminate the bias (i.e. the simultaneous equation bias) possibly involve the problem of the inadequate specification of the supply function due to the lack of the theoretical and empirical guidance on this aspect. The single equation model not only helps researchers to avoid such bias problem but also provides them effort-and- time saving advantages.

Additionally, there are other problems which may contribute to the emergence of such poor empirical results. They possibly arise from the following sources:

- 1) *The rigid theoretical structure of the adopted model.* The stock adjustment model as mentioned before does not permit to employ additional variables, particularly those ones in qualitative nature which would have been quite useful in explaining the holdings of bank items during a time period when the banks have encountered numerous external and internal factors.
- 2) *The nature of data utilized in the tests.* The aggregated data, used in the tests may be of poor quality and far from being reliable due to the possibility that the provision of full insurance guarantee and instable conditions may have exerted undesirable effects on the data generating structure of the banking system.

Relying on Griliches (1967), it may be pointed out that statistically significant high above zero values found for the estimates of the lagged dependent variable may very well be an indicator of the presence of high serial correlation whose consequences are well discussed in the econometrics literature. Such a problem plus the above stated problems, as a whole, may become a source of major concern for casting doubts on the conclusions of the study which have been reached by examining the test results of the adopted model.

In conclusion, it should be pointed out that the findings of the present study, in spite of their doubtful qualities, have potential to increase empirical knowledge of commercial banks' lending, investing and fund-seeking activities carried out under the provision of full deposit insurance scheme and the prevailing instable economic, political, social conditions. Moreover, the study may become a point of reference for the future investigations on the commercial bank behavior in the developing economies which are going to be conducted by using different methodological procedures.

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Abstract

The present paper aims to determine whether the Turkish commercial banks' holdings of items which represent major lending, investing and fund seeking activities can be explained within the confines of theoretically specified economic variables. For this purpose, the stock adjustment model is adopted and tested against quarterly data which are generated by the banks during a time period which has witnessed the provision of full deposit insurance and instable economic, political and social conditions. The regression results obtained by this investigation, as a whole do not provide, on statistical grounds, any affirmative answer to the research questions regarding to the bank holdings of lending, investing and funds seeking activities.

Such results may possibly stem from the following sources: i) the rigid structure of the adopted model in the form of a single demand equation, ii) the nature of data utilized, and iii) the possible existence of high serial correlation due to the presence of the lagged dependent variable among the explanatory variables. Despite its shortcomings, this study can be a point of reference for the future investigations on commercial bank behavior in developing economies.

