

BANK LIQUIDITY RE-EXAMINED: EVIDENCE FROM THE TURKISH COMMERCIAL BANKING SYSTEM*

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1. Introduction

As Pierce (1966) points out, assets are considered liquid if they have the capacity to produce full or near-full value in short time. Thus, assets that possess this attribute can easily and almost fully be converted into cash which is a perfectly liquid asset. In the portfolios of commercial banks, liquid assets play a very crucial role due to the fact that the banks operate largely with the funds borrowed from depositors in forms of demand and time deposits. Since these deposits represent the obligations of the banks to be paid whenever they are requested, the banks should always allocate their funds in such a way that their portfolios should always contain an adequate level of liquid assets.

Within the context of the above assertion, liquid assets are viewed as the essential balance sheet items which have the capacity to maintain the confidence of depositors which is the most valuable intangible asset of the commercial banking business. The banks that, deliberately or not, fail to maintain an adequate level of liquid assets in their portfolios are likely to create a fear or a loss of confidence among depositors over the safety of their deposits. This fear, as Friedman and Schwartz (1963, p. 308) point out, is contagious. It spreads among the banks through deposits withdrawals or through correspondent relations¹.

Traditionally, commercial banks in the economy assume the task of meeting the needs of the demanders for and the suppliers of funds. To continue to perform this vital task, the banks must make profits by engaging in lending and investing activities. However, the necessity of making profits drives the banks to confront with a paradox which can, on the basis of the points indicated in Wrightsman (1971, pp. 41-42) and Putnam (1983, p. 11), be explained as follows: By shifting from liquid assets which are characteristically low yielding and less risky items into illiquid assets, the banks can increase their profits. However, these assets have the properties (regarding risk and maturity) which decrease the banks' ability to meet the deposits withdrawals. On the other hand, large holdings of liquid assets in the portfolios increase banks' capabilities of meeting their obligations while they have a depressive effect on the banks' profitability. It is therefore clear that profitability and liquidity work against each other. Since both should be maintained, the banks, in the context of the existing external regulatory and supervisory

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¹ Forrestal (1985), p. 5

measures, have to establish a balance between these two dramatically opposed elements. The established balance can be viewed as the indicator of the degree of vigorousness with which the banks engage in lending and investing activities. In other words, the established balance reflects the banks' preferences towards liquidity and profitability (or risk).

Since commercial banks are highly leveraged financial institutions and vulnerable to runs of deposits, they should be discouraged from taking excessive risks in their lending and investing activities. However, the arguments and evidences presented in Benston (1984), Keeton (1984), McCarthy Jr. (1984), Forrestal (1985) and Corrigan (1986) lead us to argue that the instable conditions prevailing in the economy, by undercutting the effectiveness of the existing external regulatory and supervisory measures, encourage the banks to take excessive risks in their lending and investing activities². Excessive risk takings, in turn, produce substantial increases in holdings of illiquid assets in the banks' portfolios. Inevitably, aggressive behavior of the unhampered banks adversely effects the level of liquid assets. These behavioral changes in the commercial banking sector during the instable periods eventually cause a fear to emerge among depositors over the safety of their money.

On the basis of the above explanations, the following proposition can be made: commercial bank liquidity is not only an issue that should be considered in terms of the asset-side items of the bank balance sheet but also an end-product of the prevailing conditions in the economy. The present study, by making this proposition standing base, aims to analyze the liquidity issue of the Turkish commercial banks during the time period 1970-1979 which was totally dominated by the severely instable conditions.

2. Research strategy and empirical results

In the Turkish commercial banking system, the State-owned special law banks and the private banks operate side by side. The State-owned banks assume special tasks for

2 In the study, economic, social and political disturbances are, as a whole, referred to as the instable conditions. Under the instable conditions, economic units behave so unpredictably that the authorities cannot make meaningful predictions about the eventual effects of their actions. It is instructive to note that the stable conditions will have positive effects on the bank liquidity by fostering sound and honest banking practices in lending and investing activities.

the critically important sectors of the Turkish economy. They are therefore considered as the indispensable tools for the governmental policies. On the other hand, the main objective of the private banks is to make profits since they assume the stockholder responsibility.

The differences between the bank groups regarding to status naturally raise the following question: Do such differences produce different behavior in their lending and investing activities? In an operational form, this question can alternatively be stated as follows: To which extent can the lending and investing behavior of the State-owned special law bank and the private banks be explained in terms of the common variables which have been specified by the conventionally accepted economic theory?

Phase 1

In this phase of Section 2, the empirical tests will be performed in order to provide an answer to the above question. To conduct these tests, at first, the consolidated balance sheet items of the banks are rearranged to reflect their vital roles in the economy as intermediaries³. This rearrangement is presented in Table 1.

Secondly, the demand equations are formulated for the assets which represent the major forms of the lending and investing activities of the banks, i.e., securities portfolio, loans and participations⁴. The general form of the demand equations can be written as follows:

$$D_{it} = a + b B_t + c R_{it} + e$$

where

D_{it} : i the asset in period t (D_1 :SP, D_2 :L and D_3 :P)

B_t : Budget variable ($B_t = \text{paid capital} - (\text{unpaid capital} + \text{loss}) + \text{excess reserves} + \text{allowances} + (\text{demand deposits} + \text{time deposits} + \text{other deposits}) - \text{legal reserves}$)

R_{it} : Average own rate of return in period t (R_1 : average rate of return on SP, R_2 : average rate of return on L and R_3 : average rate of return of P)

a : the intercept

e : the error term

3 Turkish Banking Association publishes the consolidated balance sheets of the member banks in its annual publication titled *Information About Balance Sheet, Profit and Loss Accounts, Organization, Regulations and Loans*. All the data used in the present study were collected from this source for the period 1970-1980.

4 For the period 1970-1979, SP, L and P made up about 60 percent of the total bank assets. More specifically, the relative shares of SP, L and P in the total bank assets were approximately 6%, 51% and 3%, respectively.

Table 1

A REARRANGED BALANCE SHEET OF COMMERCIAL BANKS

Assets	Mnemonic
Vault Cash	C
Obligations of the Demanders of Bank Funds (Major Forms of Lending and Investing Activities:	
Securities Portfolio	SP
Loans	L
Participations	P
Balancing Items	BIA
Equities	
Claims of the Suppliers of Bank Funds (Major Sources of Bank Funds):	
Demand Deposits	DD
Time Deposits	TD
Other Deposits*	OD
Balancing Items	BIE

* Government Deposits

The above model is structurally a standard demand model. It assumes that the bank assets are under the control of the banks. The empirical results which were obtained by testing (natural) log-linear form of the model against the annual data in the first-difference form for the period 1970-1979 are presented in Table 2.

The following findings deserve to be noted⁵:

- i. Summary Statistics: Each equation in the table has a reasonable amount of explanatory power in spite of the fact that the variables were employed in the first-difference form. Other summary statistics appear to be quite plausible.
- ii. The Budget Variable: The estimated coefficients of the B_t variable, regarding size and significance, appear to have acceptable qualifications. These results indicate that the banks tend to increase their holdings of SP, L and P as they grow in terms of the B_t variable.
- iii. The Average Own Rate of Return Variable: This variable produced statistically acceptable results which can be interpreted to suggest that an increase in R_t results in

5 Ertuna (1979), by employing a stock adjustment model, produced similar results.

an increase in the holdings of the bank assets in consideration.

iv. The private banks are relatively more sensitive to the budget and interest rate variables.

A basic conclusion to be drawn from the empirical results presented in Table 2 is that the State-owned special law banks and the private banks respond to the fundamental factors in such a way that is consistent with the widely accepted economic theory. On the basis of this conclusion, both banking groups will be utilized as subjects in the tests to be performed in Phase II.

Table 2

REGRESSION ESTIMATIONS

	Private Banks			State Owned Special Banks		
	SP	L	P	SP	L	P
Intercept	-0.052	-2.568	-0.427	-0.769	-0.921	-1.087
Budget constrain	0.116 (3.723)	0.193 (2.664)	0.214 (1.963)	0.098 (2.574)	0.100 (2.288)	0.004** (1.592)
Own Rate of Return	0.041 (4.322)	0.129 (3.097)	0.092 (3.301)	0.021 (2.455)	0.076 (3.659)	0.020 (1.961)
Summary Statistics						
R ²	0.560	0.497	0.418	0.419	0.400	0.476
q	0.130	0.113	0.209	0.063	0.108	0.155
D-W	1.869	2.124	1.973	1.788	1.943	2.195

** : It was found statistically insignificant in the tests given at 5% and 10% levels.

Notes: The Numbers in the parentheses are t-statistics. R²: The coefficient of determination, p: the standard error of the regression, and D-W: the Durbin-Watson test statistic.

Phase 2

The empirical results obtained in Phase I enable us to restate the aim of the present study as follows: By applying econometric procedures, to determine the degrees of liquidity of securities portfolio, loans and participations of the Turkish commercial banks over a time period which was totally dominated by the instable economic, social and political conditions. To realize this objective, the following model is adopted:

$$\log \frac{C}{X_i} = - \frac{1}{1+p} \log \frac{b_i}{b_c} + \frac{1}{1+p} \log \frac{1+R_c}{1+R_i} + e$$

where

C : Vault cash in period $(t+1)$

X_i : A bank asset in period $(t+1)$

X_1 : SP

X_2 : L

X_3 : P

R_c : The return on C which is null since C represents the idle cash balances

R_i : Average own rate of return on X_i

R_1 : average rate of return on SP

R_2 : average rate of return on L

R_3 : average rate of return on P

p : Substitution term in constant elasticity of substitution function

The first term in the right side of the above equation is the intercept, e is the error term.

On the other hand, $\frac{1}{1+p}$ (i.e., E_{c,x_i}) is the term which directly indicates the degree of liquidity (moneyness) of X_i through X_i 's degree of substitutability with C ⁶.

The above model which is derived from the constant elasticity of substitution utility function was originally proposed by Chetty (1969)⁷. Within the theoretical framework laid down by the model, it is assumed that given the level of the budget variable, commercial banks combine C and X_i in order to maximize their utilities with respect to liquidity and return. To determine the size of the elasticity of substitution between C and X_i or the degree of liquidity of X_i , the model was tested against the annual time series data for the period 1970-1979, by using the ordinary least squares method. The test results are presented in Table 3.

A brief examination of the empirical results in the table reveals that the summary statistics and t-statistics are quite plausible: Except equations related with participations, the estimates are not subject to any serious autocorrelation problem. The coefficients of determination (R^2 s) are quite high. t-statistics, with one exception (equation II.3) have passed the tests of significance employed at the 5 and 10 percentage levels.

6 The value of E can be anywhere between 0 and ∞ if two items (C and X_i) are substitutes, Brown (1968, p. 18). Thus, the larger the value of E_{c,x_i} is the greater the degree of liquidity of X_i .

7 The general form of the constant elasticity of substitution utility function can be written as follows:
 $u = (b_c C^{-p} + b_i X_i^{-p})^{-(1/p)}$

Table 3
REGRESSION RESULTS

Equations	Private Banks	Intercept	Coefficient of $\log 1 + R_c / 1 + R_l$ ($E_{c,x1}$)	Summary Statistics R^2	q	D-W
I.1	Securities Portfolio	-0.321	0.049 (3.02)	0.53	0.12	1.81
I.2	Loans	-0.672	1.157 (2.73)	0.54	0.28	1.94
I.3	Participations	-0.966	-1.878 (2.10)	0.47	1.19	3.39
	<u>State Owned Special Banks</u>					
II.1	Securities Portfolio	-0.890	0.713 (3.24)	0.53	0.16	1.70
II.2	Loans	-1.102	1.580 (2.44)	0.64	0.22	2.17
II.3	Participations	-2.289	-1.263* (1.41)	0.41	1.20	3.32
	<u>All Banks</u>					
III.1	Securities Portfolio	-0.723	0.800 (3.61)	0.57	0.09	1.87
III.2	Loans	-1.477	1.673 (2.01)	0.67	0.18	1.93
III.3	Participations	-0.955	-1.920 (2.08)	0.39	1.33	3.56

* Statistically insignificant

Notes: The numbers in the parentheses are t-statistics, R^2 : The coefficient of determination, q : the standard error of the regression and D-W: the Durbin-Watson test statistic.

After the evaluation of the estimated sizes of the coefficient of $\log 1 + R_c / 1 + R_l$, the following can be pointed out:

1. The estimates of $E_{c,x1}$ show that there is a low degree of substitutability between C and SP. That is, securities portfolio has a low degree of moneyiness and it therefore cannot easily and fully be converted into cash. This empirical evidence confirms the notion that securities portfolio, in reality, represents the banks' compulsory investments in government securities
2. The estimated values of $E_{c,x2}$ lie in the range of 1.157-1.673. Although these estimates are numerically higher than those of $E_{c,x1}$ they do not reveal a high degree of substitution between C and L. Thus, loans also lack the required attribute that a liquid asset should possess.
3. The estimates of $E_{c,x3}$ are quite interesting since they consistently produced negative

signs. These results can be interpreted to suggest the existence of the complementary relationship between C and P. This suggestion is acceptable since participations represent the banks' long-term investments for profits and for control of interest.

3. Conclusion

The time period covered by this study was under the influence of the extremely instable economic, social and political conditions. The data which were generated by the commercial banks operating under such conditions provided an unique opportunity to examine the Turkish commercial banks' preferences toward liquidity, by concentrating on their lending and investing activities. Particularly, the present study was interested in these two questions: 1) Do the fundamental economic variables play significant roles in the banks' lending and investing behaviors? 2) Do the assets which represent the major forms of the banks' lending and investing activities have the capacity to produce full or near-full value when needed?

The empirical results produced by the present study suggest the following: i) The banks' lending and investing behaviors can be explained within the confines of the conventionally accepted economic theory. The budget variable and the own rate of return were found to play significant roles in determining the lending and investing behavior of the State-owned special law banks and of the private banks; ii) Securities portfolio and loans have low degrees of liquidity. On the other hand, participations appear to be a totally illiquid asset. The roles of SP, L and P in preserving the confidence of depositors are therefore considered marginal.

Over the period 1970-1979, the average value of the ratio of net profit to paid capital is about 32 for the Turkish commercial banks.

On the basis of this fact and the empirical findings of the study, it can be indicated that the banks aggressively sought the profitable lending and investing opportunities during this time period. Alternatively, it can be cited that the prevailing instable economic, social and political conditions encouraged the banks to take excessive risks in their lending and investing activities. Consequently, in their portfolios, the assets with low degrees of liquidity were amassed.

As it has been observed by Artun (1980), the Economist (1983) and McKenzie (1985) that during the period under consideration, the commercial banks, through aggressive profit seeking activities, have established close ties with the industrial firms in the Turkish

economy. When this observation is blent with the findings of the present study, it can be argued that the commercial banks, the most prominent financial intermediaries of the Turkish economy, stand out as highly fragile and vulnerable institutions. There are numerous exogenous and endogenous factors to the banking system that can easily make these institutions a primary cause for a financial panic. The cost of such panic surely extends far beyond the banks in question.

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UN RÉEXAMEN DE LA LIQUIDITÉ BANCAIRE À PARTIR DE L'EXPÉRIENCE DES BANQUES COMMERCIALES DE LA TURQUIE

RESUME

L'importance fondamentale de la liquidité bancaire découle du fait que les banques commerciales sont des organismes d'intermédiation financière avec un rapport moyens externes/moyens propres très élevé. A la lumière de l'intérêt accru de la solidité financière des systèmes bancaires évoluant dans des conditions instables, cet article considère la liquidité bancaire non seulement comme un aspect du budget des entreprises d'intermédiation financière mais aussi comme un produit des conditions économiques, sociales et politiques du système. De cette constatation on peut tirer la conclusion que les conditions d'instabilité encouragent ces institutions financières (caractérisées par un rapport moyens externes/moyens propres très élevé) à agir d'une façon agressive dans leur activité. Il faut rappeler que les conditions d'instabilité réduisent l'efficacité des mesures de réglementation, de supervision et de contrôle existantes. Inévitablement, l'agressivité des comportements des banques influence négativement la liquidité des banques commerciales. D'après les observations précédentes, cet article cherche à examiner les problèmes de liquidité des banques commerciales de la Turquie dans la période 1970-79, période totalement dominée par des conditions instables. Pour réaliser l'objectif rappelé, cette analyse essaie de: 1) déterminer si le comportement des banques en ce qui concerne les prêts et les investissements est compatible avec le comportement traditionnellement accepté par la théorie économique, 2) déterminer le degré de liquidité des activités de prêt et d'investissements, c'est-à-dire prêts, participations et valeurs mobilières. Sur la base des données empiriques et de l'existence de liens très serrés entre banques et entreprises industrielles, l'article permet d'arriver à la conclusion suivante. Les banques commerciales de la Turquie apparaissent des institutions financières caractérisées par un degré élevé de fragilité et vulnérabilité qui peut facilement devenir une cause importante de panique financière. Les effets éventuels de cette panique financière s'étend bien au delà des banques qu'on a examiné.