

# DETERMINANTS OF GROWTH OF BANK DEPOSITS IN PAKISTAN

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## 1. Introduction

In Pakistan, the commercial bank deposits have been increasing at a fairly good pace during last 25 years. However, like other LDC's the expansion of commercial bank deposits could not be considered adequate to match the ever increasing demand for bank credits. It is well established that for increasing level of economic activity, demand for bank credit increases. The commercial banks have to play a major role in promoting economic development in absence of traditional functions by the relevant agencies. These banks accept deposits and lend to create worthy borrowers against suitable collateral. There are several constraints and a weak monetary system in Pakistan which does not ensure readily available advances in the economy. The expansion of deposits by these commercial banks are the obvious solution. In most of the developing countries it has been observed that a high proportion of money is held in currency and a low proportion in bank deposits (Furness, 1975). Such a situation implies that majority of loans have to be made in currency which hinders deposit creation. Also, the lack of an array of domestic financial assets induces many to hold foreign securities, private investments in informal financial sector<sup>1</sup>. Such action will again lead to a reduction of bank deposits. The other factor which restrict the deposit creation by commercial banks is the statutory obligation under which the commercial banks are required to maintain a minimum ratio of reserve assets to deposits.

In developing economy, the commercial banks are recognised for their vital role in the economy to enable to continue to meet the ever growing demand for credit. It is necessary to enhance the deposit rate or the public's willingness to reduce the propensity to hold cash. This discussion of willingness of the public to deposit in commercial banks motivates to raise question like, what determines the bank deposits<sup>2</sup> and whether the nationalisation of commercial banks indicated any shift in these determinants or not. The objective of this study is to identify the factors determining the commercial bank

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1 The informal financial sector includes (i) traditional, non-corporate banking and other financial institutions; (ii) credit arrangements in the non-corporate cotton textile sector; (iii) credit arrangements in the urban transportation sector; (iv) the "hundi" systems of foreign exchange transactions; (v) merchant credit operations, particularly in commodities markets and (vi) the very important and rapidly growing institutions of Finance and Deposits companies.

2 The nationalisation of commercial banks during 1974 emerged in the context of the problem of concentration of economic power in the hands of private parties who used the possession of money institutions as a source of exploitation which used national wealth and private deposits to create money for the financing of monopoly capitals.

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deposits (demand deposits and time deposits) in Pakistan. The study also compares the post and pre-nationalisation periods and test the hypothesis that deposit grew faster in post nationalisation period. The study is based on the basis of aggregate data for the period 1959-60 to 1985-86.

The paper is organised such that section 2 discusses the theoretical background and determinants of commercial bank deposits, section 3 discusses the data, methodology, the estimation and interpretation of results are presented in section 4. Section 5, gives the summary and conclusion of the study.

## 2. Theoretical Framework and Model Specification

The commercial bank deposits are one of the several form of financial assets in which public can invest their wealth to maximise their utility. This implies that one will seek an apportionment of his wealth such that the rate at which he can substitute one form of wealth for another is equal to the rate at which he is just willing to do so. There is no published data available for wealth or its equivalent concept "permanent income" of the public, the national income (value of GNP) will be used as a proxy for the wealth of the public. The increase in income would provide community saving in addition to increased transaction demand for money. Since part of the community savings would be in the form of commercial bank deposits, the demand for deposits would be positively related to the national income. Comparing rural and urban areas contribution in total deposits, no data readily available, however it is generally felt that less banking facilities are available to rural areas and there is a strong currency preference among the rural people. This indicates that rural income level may not have larger impact as would be of urban income. Comparing the pre and post nationalisation period it is argued that the impact of agriculture income would be positively related to banking activity as the commercial banks neglected agriculture sector in pre-nationalisation period (Ghatak, 1981).

Regarding investment of wealth in addition to deposits, there are numerous other financial and physical assets which the public can put their wealth. These are; industrial securities, national defence certificates, preferred share, debenture, real estate, liquid assets and commodities etc. These alternative financial and non financial assets are substituted for commercial bank deposits and will lead to an inverse relationship between the demand for deposits and the earnings or yields on these alternative.

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As mentioned earlier more bank branches are required to capture the deposits from the unbanked areas. As more and more people are accessible to banking system, more people would be willing to deposit their idle cash holding or at least a part of their wealth into deposits. The availability of banking facilities is measured as number of branches in the country.

The credit expansion also plays a vital role in matching the growing economic activity in the country<sup>3</sup>. Once the credit is given to the user, the same is deposited in one of the banks resulting an increase in deposits. However, the ratio is not one to one but these deposits are utilized or taken out over a period of time as per requirement of the individual and hence these credit or part of credit to individuals (s) remains as deposit with banks. This behaviour implies that one would expect the demand for deposits as an increasing function of bank credit.

The other most important consideration regarding demand for particular deposit is the return or yield on it, which is price for losing one's liquidity at particular time. This implies that demand for a particular deposit is positively related to yield paid on it. Theoretically, it is argued that for depositors, the expected rate of interest on deposits is more meaningful rather than current interest rate (Sandhu and Goswami, 1986). To consider the expected rate of interest in demand function, lagged dependent variable should be included as one of the explanatory variables<sup>4</sup>.

3 In Pakistan the bank credit is declared by State Bank and Finance authorities on the basis of expected growth rate in domestic income, and adjusted further keeping the reserve requirement situation and deficit financing in the country (See Meenai, 1984).

4 This argument is well taken by using Cagan's (1956) adaptive expectation hypothesis which assumes that the demand deposits depend on the expected interest rate  $i_{dt-1}^e$  on deposits and that the expectations about interest rate are revised by  $i_{dt}^e - i_{dt-1}^e$  in proportion to error  $(i_{dt}^e - i_{dt-1}^e)$  associated with the previous level of expectations  $i_{dt}^e$  being the actual deposit rate in current period and  $i_{dt-1}^e$  the previous period's expected deposit rate. The same is written as:

$$D_t = a i_{dt}^e + \mu_t \quad (1)$$

$$(i_{dt}^e - i_{dt-1}^e) = \beta (i_{dt}^e - i_{dt-1}^e) \quad 0 < \beta < 1 \quad (2)$$

where  $\mu_t$  is the stochastic disturbance term. As we discussed, expected interest rate  $i_{dt}^e$  is unobservable, it can be expressed in terms of some observable variable. From (1) and (2) we derived:

$$D_t = b_{dt} + (1-\beta) D_{t-1} - \nu \quad 0 < \beta < 1 \quad (3)$$

The  $D_{t-1}$  term appears due to the fact that  $i_{dt-1}^e$  term appears on right hand side of the equation (3), which explains the demand for deposit of last year  $D_{t-1}$ .

On the basis of the above theoretical discussion the simple model which will attempt to explain the determinants of commercial bank deposits can be written as:

$$D_t = f(Y_t \text{ or } Y_a \text{ or } Y_{na}, \gamma_d, \gamma_\beta, \gamma_{SP}, \gamma_{RS}, \gamma_{DC}, \gamma_{KD}, BC, BB, D_{t-1}, D_1, D_2 \text{ or } D_3)$$

Where

- $D_t$  = Deposit of commercial banks in nominal terms
- $Y_t$  = Gross National income at market price
- $Y_a$  = National income from agricultural sector at market price
- $Y_{na}$  = National income from non-agricultural sector at market price
- $\gamma_d$  = Interest rate on the commercial bank deposits
- $\gamma_\beta$  = Yield on government bonds and securities
- $\gamma_{SP}$  = Yield on industrial securities
- $\gamma_{RS}$  = Investment index on real estate
- $\gamma_{DC}$  = Yield on defence certificate
- $\gamma_{KD}$  = Yield on national saving schemes (Khas Deposit)
- $D_{t-1}$  = Deposits of commercial banks in preceeding year
- BC = Bank Credit in nominal terms
- BB = Bank branches in the country
- $D_1$  = Dummy variable = 1 for nationalisation and  
= 0 for pre nationalisation period
- $D_2$  = Slope dummy i. e  $D_1$  multiplied by  $Y_t$
- $D_3$  = Slope dummy i. e  $D_1$  multiplied by  $Y_{na}$

#### *Demand Deposits and Time Deposits*

Furthermore, deposits are classified as demand deposits, time deposits and other deposits such as national saving schemes, defence and khas deposits etc. The demand deposits are largely held to satisfy the liquidity motives to ease the payments. These deposits are withdrawl on demand through cheques but they earn no interest. In general, depositors are allowed to write cheques on saving deposits subject to certain restric-

tions. The banks also allow withdrawal of time deposits on demand if depositors are willing to forego substitutability between demand and time deposits. This substitutability will lead to inverse relationship between the demand for demand deposits and interest rate on time deposits. It is important to mention that time deposits are not a universal means of payment but they are near perfect liquid earns income and as a fixed capital value. The time deposits are treated as a unique store of value.

Incorporating the above hypotheses discussed earlier the following two demand functions are to be determined:

$$DD_t = f(Y_t \text{ or } Y_a \text{ or } Y_{na}, \gamma_t, \gamma_B, \gamma_{SP}, \gamma_{RS}, \gamma_{DC}, \gamma_{KD}, BC, BB, D_1, D_2 \text{ or } D_3) \quad (4)$$

and

$$DT_t = f(Y_t \text{ or } Y_a \text{ or } Y_{na}, \gamma_t, \gamma_B, \gamma_{SP}, \gamma_{RS}, \gamma_{DC}, \gamma_{KD}, BC, BB, DT_{t(-1)}, D_1, D_2 \text{ or } D_3) \quad (5)$$

where  $DD_t$  and  $DT_t$  are the demand and time deposits respectively.

### 3. Data

The study is based on secondary data. The time series data for aggregate demand deposit after 1973-74 are available in State Bank of Pakistan in various publications, while for the period 1959-60 to 1972-73 separate data for West Pakistan was not available. We used data from the study by Kemal (1979). The bank credit and bank branches data are available in various issues of Pakistan Economic Survey and Statistical Year Book. The yield data on various alternative financial assets and alternative mode of investment are published in State Bank Bulletin and Annual Reports. However, it is important to mention that the data on  $\gamma_B$ ,  $\gamma_{DC}$  and  $\gamma_{KD}$  i.e. yield of government bond and securities, yield on defence certificate and yield on khas deposits are not available for the entire study period. Due to non-availability of data on yield on real estate, an index for investment in real estate was used. The data on deposits and national income are given in billion rupees, interest rates and yield on financial assets are given in percentage, whereas for the return on industrial securities indices of share price is used.

#### 4. Estimation and Empirical Results

The single equation least square estimates of the demand functions for demand deposits and time deposits, using stepwise multiple regression are given in Tables 1 and 2. We used log linear regressions so that the coefficients of which directly provided the respective elasticities. The pooled data for post and pre-nationalisation regime is used for estimation, using intercept and slope dummies for nationalisation period. The slope dummy is obtained by multiplying the national income by 1 for post nationalisation and by zero for pre-nationalisation period.

On inspecting the estimated regressions in Table 1 and Table 2, the theoretically and statistically appropriate estimation for demand functions of demand deposits and time deposits are given as:

$$\begin{aligned} \text{Log DD} = & \quad 0.8851 & + & 1.4588 \log Y_t & - & 2.0824 \log \gamma_{SP} \\ & (7.2489) & & (1.1348)^{***} & & (0.9772)^* \\ & + & 0.1633 \log C & - & 16.4473 D_1 & + & 1.3817 D_2 \\ & & (0.6460) & & (10.4149)^{**} & & (0.9138)^{**} \end{aligned} \quad (1)$$

$$R^2 = 0.9144$$

$$\text{D.W.} = 2.221$$

$$\bar{R}_{\text{adj}}^2 = 0.8930$$

$$F = 42.7383$$

$$\text{SER} = 0.4542$$

$$\begin{aligned} \text{Log DT} = & \quad -3.2099 & + & 0.6452 \log Y_3 & + & 0.3000 \log \gamma_d \\ & (1.6005)^* & & (0.3067)^* & & (0.2706)^{***} \\ & - & 0.2084 \log \gamma_{rs} & + & 0.6183 \log C \\ & & (0.1945)^{***} & & (0.1445)^* \\ & + & 2.7208 D_1 & - & 0.2786 D_3 \\ & & (1.3165)^{**} & & (0.1276)^{**} \end{aligned} \quad (2)$$

$$R^2 = 0.997$$

$$\text{D.W.} = 1.65$$

$$\bar{R}_{\text{adj}}^2 = 0.996$$

$$F = 1227.43$$

$$\text{SER} = 0.07438$$

Table 1  
RESULTS OF STEP-WISE MULTIPLE REGRESSION FOR DEMAND FOR DEMAND DEPOSITS

Equation Number	DEPENDENT VARIABLE LDD										R <sup>2</sup>	D <sub>2</sub> or D <sub>3</sub>	D <sub>1</sub>	LBB	LC	L <sub>sp</sub>	L <sub>rs</sub>	L <sub>id</sub>	L <sub>na</sub>	L <sub>Y<sub>1</sub></sub>	Constant	SER
1.	-7.4959 (3.7265)*	1.5175 (0.0846)*	-	-	-	-	-	-	-	-	0.89	-0.3618 (0.4277)	3.7535 (4.6971)	-	-	-	-	-	-	-	-	0.4810
2.	-0.4887 (4.6903)	1.7315 (0.3456)*	-	-	-	-	-	-	-	-	0.91	-1.3205 (0.8614)*	-15.8590 (9.9229)*	-	-	-2.0957 (0.9537)*	-	-	-	-	-	0.4439
3.	0.8850 (7.2489)	1.4568 (1.1348)*	-	-	-	-	-	-	-	-	0.91	-1.3817 (0.9138)*	-16.4473 (10.4149)*	-	-	-2.0824 (0.9771)*	-	-	-	-	-	0.4542
4.	2.2219 (7.9400)	1.2833 (1.1055)*	-	-	-	-	-	-	-	-	0.91	-1.7407 (1.3179)*	-20.4516 (14.7722)*	0.2824 (0.6602)	-	-2.1407 (0.9785)*	-	-	-	-	-	0.4528
5.	-6.2890 (7.4773)	0.9876 (1.2664)	-	-	-	-	-	-	-	-	0.89	-0.4059 (0.6185)	4.1370 (6.4362)	-	-	-	-	-	-	-	-	0.5000
6.	-7.2298 (7.8370)	1.1767 (1.2519)	-	-	-	-	-	-	-	-	0.89	-0.3592 (1.1337)	3.5328 (12.2548)	0.1065 (0.7272)	-	-	-	-	-	-	-	0.5009
7.	-3.8559 (5.9953)	-	-	-	-	-	-	-	-	-	0.89	-0.3160 (0.6068)	3.2261 (6.3236)	0.3426 (0.7436)	-	-	-	-	-	-	-	0.5036
8.	3.3495 (10.3089)	-	-	-	-	-	-	-	-	-	0.87	-0.2816 (0.7824)	-3.0779 (8.2151)	0.7886 (0.9664)	-	-	-	-	-	-	-	0.4994
9.	0.8851 (7.2489)	1.4588 (1.1348)*	-	-	-	-	-	-	-	-	0.91	-1.3817 (0.9138)*	-16.4473 (10.4149)*	-	-	-2.0824 (0.9772)*	-	-	-	-	-	0.4542

Notes: 1. The numbers in the parenthesis are the standard error of the coefficient

2. One asterisk indicates significance at 95 percent level while two and three asterisks represent significance at 90 percent and 85 percent level respectively.

3. D<sub>2</sub> dummy is used for Y<sub>1</sub> and D<sub>3</sub> is used for Y<sub>an</sub>

Table 2  
RESULTS OF STEP-WISE MULTIPLE REGRESSION FOR DEMAND FOR TIME DEPOSITS

Equation Number	DEPENDENT VARIABLE LDD										R <sup>2</sup>	D <sub>2</sub> or D <sub>3</sub>	D <sub>1</sub>	LDT <sub>1</sub>	LBB	LC	L <sub>sp</sub>	L <sub>rs</sub>	L <sub>id</sub>	L <sub>na</sub>	L <sub>Y<sub>1</sub></sub>	Constant	SER
1.	-8.1546 (0.6851)*	1.6495 (0.0693)*	-	-	-	-	-	-	-	-	0.99	-0.6165 (0.0831)*	6.0055 (8.0792)*	-	-	-	-	-	-	-	-	-	0.1036
2.	-9.3613 (0.9805)*	1.8462 (0.1358)*	-	-	-	-	-	-	-	-	0.99	-0.7130 (0.0988)	7.1149 (1.0774)*	-	-	-	-	-	-	-	-	-	0.0997
3.	-3.6942 (1.5411)*	0.6322 (0.3075)*	-	-	-	-	-	-	-	-	0.99	-0.3342 (0.1169)*	3.2415 (1.2281)*	-	-	-	-	-	-	-	-	-	0.0746
4.	-4.0317 (6.5486)	1.1724 (1.2133)	-	-	-	-	-	-	-	-	0.89	-0.2092 (1.0636)	1.9411 (11.1052)	-	-	-	-	-	-	-	-	-	0.5076
5.	-4.0005 (2.1623)*	0.8310 (0.3941)*	-	-	-	-	-	-	-	-	0.99	-0.2988 (0.1761)*	2.9472 (1.8088)*	-	-	-	-	-	-	-	-	-	0.0874
6.	-3.8726 (2.2357)*	0.7580 (0.4465)*	-	-	-	-	-	-	-	-	0.99	-0.2978 (0.1800)*	2.9185 (1.8504)*	-	-	-	-	-	-	-	-	-	0.0894
7.	-1.0779 (1.9284)	0.1896 (0.3863)	-	-	-	-	-	-	-	-	0.99	-0.1179 (0.1505)	1.0864 (1.5458)	-	-	-	-	-	-	-	-	-	0.0704
8.	-0.5980 (2.2279)	0.0684 (0.3672)	-	-	-	-	-	-	-	-	0.99	-0.0851 (0.1561)	0.3615 (1.6691)	-	-	-	-	-	-	-	-	-	0.0908
9.	-3.2099 (1.5005)*	0.6452 (0.3067)*	-	-	-	-	-	-	-	-	0.99	-0.2786 (0.1276)*	2.7208 (1.3165)*	-	-	-	-	-	-	-	-	-	0.0742

Notes: 1. The numbers in the parenthesis are the standard error of the coefficient

2. One asterisk indicates significance at 95 percent level while two and three asterisks represent significance at 90 percent and 85 percent level respectively.

3. D<sub>2</sub> dummy is used for Y<sub>1</sub> and D<sub>3</sub> is used for Y<sub>an</sub>

Looking at estimates of the demand function in equation 1 we find that most of the variables included have significant impact on demand deposits except bank credit though the sign of the coefficient was correct. For income variable it indicated as the income increases, the transaction demand for money must also increase. This variable is indicating a significant impact during post and pre nationalisation period. During pre nationalisation the income elasticity of demand deposit is 1.4588 that indicates that a 10 percent increase in national income will increase more than 14 percent of the demand keeping all other constant. For post nationalisation period the impact of income is higher than pre nationalisation period as the income elasticity is now 2.8405 which is obtained by adding income coefficient (1.4588) and coefficient of economic activity i.e. slope dummy coefficient (1.3817). The income elasticity indicates that a 10 percent increase in income will increase about 28.5 percent of the demand deposit during post nationalisation period of commercial banks.

The yield on the industrial securities was estimated to influence significantly the demand deposits. The coefficient of industrial securities is negative thereby implying industrial securities to be substitutes for demand deposits. The significant inverse relationship with a substitution elasticity of 2.08 may be attributed that these demand deposit and industrial securities are held by institutions and as the yield or price of these shares increase by 10 percent the demand deposit would decrease by 20.8 percent. This indicates the substitution of demand deposits to the industrial security shares purchase behaviour of depositors.

The coefficient of bank credit measures the bank efficiency and is a representative of elasticity of system. The efficiency of banking system is measured that by how much of the deposits that a particular system is able to mop up consequent upon one percent rise in bank credit of the banking system itself. Following this criterion we find that the commercial banks in Pakistan are not efficient as they are attracting only 16.33 percent of the bank credit in the form of demand deposits though statistically the relationship is insignificant.

Equation (2) presents the demand function for time deposits. The demand for time deposit function indicates that the demand for time deposit depends significantly on non agricultural income, yield on time deposit, investment in real estate and bank credit etc. The impact of non agricultural income on time deposit indicates a positive and significant relationship a 10 percent rise in income contributes 6.4 percent rise in time deposits. It indicates that an increase in income from non agriculture influences the holding of asset demand for money and hence time deposit.

The elasticity of time deposit with respect to yield on time deposit is 0.30 explains that



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if the time deposits are to be raised by 10 percent the yield on time deposit is to be raised by 3 percent, keeping other things constant. The investment in real estate coefficient indicates the elasticity of substitution between the holding of time deposit by people and investments in real estate transaction. It indicates that 10 percent increase in real estate investment will result in a decline in time deposit holding by 2 percent. As a policy matter it seems that real estate is a significant substitute for liquid assets in Pakistan.

The Bank credit coefficient indicates the efficiency of bank as about 62 percent of the bank credit is captured as time deposit by the commercial banks in Pakistan during the study period.

Comparing the post and pre nationalisation regimes, as indicated by the significant coefficient of intercept dummy and economic activity dummy i.e. slope dummy, that, though the time deposits has increased during post nationalisation period but the growth rate of time deposit growth is smaller during this period.

## 5. Summary and Conclusion

The results of this study are supportive of the hypotheses that an increase in income level increases the demand for demand deposits. The investment in industrial securities is a significant substitute for the demand deposits. In other words, the public holds the demand deposits for transaction purposes and as and whenever there is an opportunity for investment they utilize the same resulting a decline in demand deposit. The demand for time deposits are influenced by non agricultural income, bank credit, interest on time deposits and investment in real estate. As a policy instrument it is clearly shown that an increase in the yield on time deposits will increase more time deposits with commercial banks.

The nationalisation of commercial banks during 1974 have indicated a significant impact on demand for both demand and time deposits. The results have shown that after nationalisation period the growth in demand deposit is higher than post nationalisation. For time deposit it indicated that though the time deposits have gone up during post nationalisation period but the growth of time deposit have declined. It clearly motivates the policy maker to make the return on time deposit more attractive and competitive than other attraction available to public.

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## Abstract

*This paper attempts to identify the determinants of growth of commercial banks deposits in Pakistan during the period 1959-60 to 1985-86. Separate demand functions are estimated for demand deposits and time deposits by using stepwise multiple regression. The two models clearly capture the impact of nationalisation of commercial banks during 1974.*

## LES DETERMINANTS DE LA CROISSANCE DES DEPOTS BANCAIRES AU PAKISTAN

### RÉSUMÉ

*Cet article tente d'identifier les déterminants de la croissance des dépôts bancaires au Pakistan durant la période 1959-60 à 1985-86. Des fonctions de demande distinctes sont établies pour les dépôts à vue et les dépôts à terme en utilisant des techniques de régression multiple par étapes. Les deux modèles mettent clairement en évidence l'impact de la nationalisation des banques commerciales en 1974.*