(69)

RESEARCH REPORT SERIES

No. 47

A Study of Scheduled Banks Response to Cost of Alternative Sources of Funds.

By

Fateh M. Chaudhri

PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS
OLD SIND ASSEMBLY BUILDING
BUNDER ROAD, KARACHI
PAKISTAN

No. 47

A Study of Scheduled Banks Response to Cost of Alternative Sources of Funds.

By

Fateh M. Chaudhri

The Research Reports of the Pakistan Institute of Development Economics are circulated to inform interested persons with regard to research progress at the Institute. These reports may be freely circulated but they are not to be quoted without the permission of the author. Work on this manuscript is still in progress; comments are invited to improve the final version.

February 1966

PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS
OLD SIND ASSEMBLY BUILDING
BUNDER ROAD, KARACHI-1
(PAKISTAN)

A STUDY OF SCHEDULED BANKS RESPONSE TO COST OF ALTERNATIVE SOURCES OF FUNDS

by

Fateh M. Chaudhri*

I. INTRODUCTION

Our aim in this paper is a limited one. We wish to study, (a) what weight the Pakistani bankers assign to cost factors in acquiring short funds from alternative sources of supply and (b) how good substitute are these alternative sources of supply of funds for scheduled banks in Pakistan. We have chosen for our study the two short money markets existing in Pakistan; namely, the call money market and the discount window of the State Bank of Pakistan.

Dr. Porter has also tested the hypothesis[1/] how net free reserves (defined as excess reserves minus scheduled banks borrowings from the State bank of Pakistan) are influenced by the relation of the call rate with the discount rate. He thinks that scheduled banks in the aggregate respond in some fashion to the spread between the discount rate andthe call rate. he considers the spread between these two as the critical variable in explaining scheduled banks' borrowings from the State Bank of Pakistan. This assumes that the funds available in the inter-bank call money market and from the State Bank of Pakistan are very good substitutues. We wish to state more explicitly how good substitutes are these alternative sources of short funds and how much 'critical' is the spread between the call rate and the discount rate in explaining scheduled bank behaviour pattern.

---

*The author is a research economist at the Pakistan Institute of Development Economics. He wishes to express his indebtedness to Mr. Abdur Rahman, a friend and colleague at the Institute, for his helpful suggestions on the design of this study. He also wishes to thank Mr. Qazi Kholiquzzoman Ahmad, Staff Economist, for providing computational help. The author, however, remains fully responsible for any remaining errors and for the points of view put-forth here.

1/Porter, Richard. C,: Liquidity and Lending: Volume of Bank Credit in Pakistan, Karachi, Pakistan Institute of Development Economics, 1963, Section: XII.

In our opinion it would be more illuminating if we compared the relative cost of alternative sources of funds, i.e. the call rate and the discount rate, in such a way that variations in cost not only explained the variations in the level of scheduled banks borrowings from the State Bank of Pakistan and the inter-bank call money market but also showed the strength of relationship between the changes in the relative position of these rates and the changes in the level of funds transacted in the two short money markets. This, we intend to do with a methodology to be outlined is section IV below.

II. THE HYPOTHESIS

Since both the inter-bank call money market and the discount window of the State Bank of Pakistan are generally assumed to offer funds to scheduled banks for short run purposes and banks in need of funds may have access to both the markets, our hypothesis is that scheduled banks behaviour pattern in obtaining funds, as rational operators aiming at minimising costs, is highly sensitive to the cost of alternative sources of funds even in an under-developed short money markets like that of Pakistan. In other words we expect a positive relationship between an increase in the rate of interest in one market and the increase of funds transacted in the other. Also we expect a strong and significant relationship between the two series of funds transacted and the interest rates charged.

To test this hypothesis and to have a better perspective of scheduled banks operational behaviour, we shall simply compute and study the elasticity of substitution, e, between funds borrowed from the State Bank of Pakistan and the call money market. This will also permit us to see how much variations in the relative level of borrowings from the State Bank of Pakistan and the call money market can be

explained by variations in the relative position of the two rates -- i.e. the call rate and the discount rate.

III. POLICY IMPLICATION OF THE STUDY

The policy implication of this study is that if the elasticity of substitution, e, is found to be high and the coefficient of determination between the relative position of the two rates and the level of funds transacted in the two markets is also high, then by maneouvering one rate in one market, the amount of funds transacted in the other would be affected in a predictable fashion and the same may, therefore, be influenced in the desirable direction.

IV. METHODOLOGY OF THE STUDY

Let us designate :

Qc quantity of funds transacted in the call money market ;

Qd quantity of funds borrowed from the State Bank of Pakistan;

Pc the average rate of interest in the call money market during a certain period;

Pd the discount rate during that period ;.

The elasticity of substitution, e, between the funds borrowed from the State Bank of Pakistan and the call money market may then be defined by the following relationship:

$$(Qc/Qd) = A\ (Pd/Pc)^{e} \qquad \text{or}$$

$$\log (Qc/Qd) = \log A + e \log(Pd/Pc)$$

When log (Pd/Pc) is regressed on log(Qc/Qd), the elasticity of substitution, e, and some residual is found. The double-log form of the regression is appropriate to find elasticity over the whole range and is likely to give satisfactory fit to the data in our case.

V. EMPIRICAL ESTIMATES

Regression between log (Pd/Pc) and log (Qc/Qd) yielded the following coefficients of the equation :

$$\log(Qc/Qd) = -.\ 104680 + \underset{(.192)}{1.568188} \log (Pd/Pc)$$

$$R^2 = .946$$

The coefficient of log (Pd/Pc), = 1.56188, is the elasticity of substitution, e, between funds transacted in the inter-bank call money market and funds borrowed from the State Bank of Pakistan. The figures in the parenthesis, .192 , indicates its standard error. The coefficient means that an increase in the ratio of discount rate to call rate by 1 per centage point would give rise, ceteris paribus, to the ratio of call money funds to discount window funds by 1.57 percentage points. Sign of the elasticity coefficient is also consistent with our hypothesis of a positive relationship between changes in the rate of interest in one market and the changes in the amount of funds transacted in the other market -- i.e. if the ratio of Pd to Pc goes up by 1 per cent, the ratio of Qc to Qd goes up by 1.57 per cent.

The coefficient of correlation between the ratio of interest rates and the ratio of funds transacted in the call money market and the discount window of the State Bank of Pakistan was found to be very high, (R = .973) and significant at 1 % level of the significance test.

The coefficient of determination, (R^2 = .946), was therefore, also very high. It means that variations in the quantity of funds transacted 'explained' with the variations in the relative cost of funds are very high-- i.e. about 95 per cent. In other words, factors other than the cost of funds are not important determinants for the amount of funds transacted in the two markets.

To be able to test the presence of autocorrelated disturbances, the Durbin - Watson statistic, d, was calculated and found to be, d = 1.47. For 36 observations and one explanatory variable, the Durbin-Watson upper bound d_u is equal to 1.32 at 1 % level of significance. Since the figure for our d is greater than d_u the hypothesis of a random disturbances in favour of a positive autocorrelation cannot be rejected -- i.e. there is no evidence of autocorrelation among the residual terms.

V. CONCLUSIONS

The findings are quite significant in view of the fact that the call money market is not very well developed and is alleged to suffer from rigidities and imperfections. Our finding of a high elasticity of substitution between the call money and the discount money, depending mainly on the cost of two sources of funds, does not support the assertion, often made, that the existing interest rate structure and scheduled banks behaviour pattern are insensitive. The high elasticity of substitution, e , further repudiates the assertion that ' in the absence of a well developed short money market and extensive chain of commercial banks, the efficiency of the bank rate is rather limited'[2/].

Let it be remembered here that the extent of activity in the call money market has increased from an average quarterly transaction of about 15.0 million rupees in 1954 to about 47.5 million rupees in 1964. With such an enormous increase in the activity, the price of transactions in the call money market has become a sensitive indicator of scheduled banks behaviour and the money market position in general. In any analysis of the money market and scheduled banks operational behaviour, this fact must be given due recognition. Decisions based on the assumption of insensitivity of scheduled banks behaviour to cost factors would, therefore, be misleading because such an assumption does not stand the empirical test devised above.

2/ Meenai, S.A., An Appraisal of the Credit and Monetary Situation in Pakistan, Karachi, The State Bank of Pakistan, p. 129.

Appendix : A

SOURCES OF DATA

Quarterly data on the reallocation of funds through the call money market were obtained from the liabilities side of the Weekly Statements of scheduled banks in Pakistan as given in the State Bank of Pakistan, Bulletin, table captioned :" Scheduled Banks in Pakistan : Weekly Consolidated Position". We took the sum of interbank deposits and interbank borrowings.

Data on scheduled banks borrowings from the State Bank of Pakistan are also given in the above table of the Bulletin.

Call money rate are quoted in the State Bank of Pakistan, Report on Currency and Finance, in the table titled: "Inter-bank Call Money Rates (Karachi)" and the Bulletin, table related to "Selected Economic Indicators".

The discount rate (i.e. the rate applicable to borrowings from the State Bank of Pakistan) remained constant at 3 % till January, 1959 when it was raised to 4 % and remained there during the period covered by our study. Later, in June, 1965, it was raised to 5 % but our study does not extend to that point of time.

Appendix: B, Data on the reallocatio of funds in the call money market, Qc, and borrowings from the SBP, Qd, call rate, Pc, and the discount rate, Pd.

Quarters		Qc	Qd	Pc	Pd	log Qc-log Qd	log Pd-log Pc
		1	2	3	4		
1956	I	163.1	171.9	.029	.03	-0.022822	+ .014723
	II	136.4	39.6	.011		.537119	+ .385726
	III	139.2	43.5	.015		.505150	+ .401030
	IV	196.7	124.5	.028		.198635	+ .029963
1957	I	191.5	187.6	.028		.008936	+ .029963
	II	189.5	95.4	.020		.297832	+ .176091
	III	196.7	55,5.	.010		.549511	+ .477121
	IV	222.5	107.4	.022		.316326	+ .134698
1958	I	223.7	160.3	.038		.128774	- 0.102603
	II	191.4	53.9	.009		.550353	+ 0.522880
	III	190.1	27.3	.007		.842819	+ .632023
	IV	193.8	152.6	.025		.103799	+ .079181
1959	I	224.2	122.9	.024	.04	.261084	+ .221849
	II	187.9	13.0	.009		1.159993	+ .647817
	III	190.1	49.9	.013		.580881	+ .488117
	IV	193.8	43.6	.018		.647868	+ .346787
1960	I	222.2	127.1	.038		.242598	+ .022276
	II	237.4	73.8	.032		.507425	+ .096910
	III	266.8	39.4	.028		.830690	+ .154902
	IV	357.6	249.1	.044		.157606	- .041393
1961	I	260.2	405.1	.032		- .192255	+ .016910
	II	265.4	327.0	.035		- .090647	+ .058992
	III	292.9	374.9	.037		- .107196	+ .033858
	IV	336.7	445.9	.038		- .129803	+ .022276

	Quarter	r_c	q_d	r_c	r_d	$\log r_c - \log q_d$	$\log r_d - \log r_c$
		1	2	3	4	5	6
1962	I	356.4	693.3	.039		- .268983	+ .016995
	II	408.1	505.7	.033		- .093126	+ .083540
	III	400.9	337.2	.025		.075148	+ .201120
	IV	403.6	399.6	.033		.004326	+ .083540
1963	I	401.1	512.9	.034		- 0.101400	+ 0.070561
	II	434.4	373.4	.026		0.056716	+ 0.187087
	III	419.9	340.9	.023		0.090519	+ 0.241032
	IV	431.9	398.8	.033		0.034628	+ 0.083540
1964	I	429.7	877.4	.041		- 0.310033	- 0.010724
	II	452.7	834.0	.037		- 0.207434	+ 0.033858
	III	489.5	787.5	.027		- 0.206498	+ 0.170696
	IV	493.2	1190.3	.038		- 0.382309	+ 0.022276

* All values in Col : 1 and 2 are in lakhs of rupee (lakh = 1,00,000)

** Sources of data are given in Appendix 'A'.