CHAPTER - 3

MONEY FINANCE AND SAVINGS - INVESTMENT IN INDIA.

It is no denying the fact that the financial sector matters for the process of economic development. In fact, this is the sector where a large parts of an economy's savings are intermediated towards productive investment purposes. Since the rate of capital accumulation is a fundamental determinant of long-term growth, the efficiency of financial sector (where the allocation of savings to investment project occurs) is potentially important for the long-term performance of an economy.

The analysis of this chapter attempts to test the following hypotheses regarding the impact of monetary deepening, financial deepening and intermediation processes on saving and investment flows in the Indian economy. It involves the theoretical and empirical analysis of savings in response to financial growth, the complementarity between money and capital, effect of negative real rate of interest on economic growth or existence and impact of financial repression and allocational efficiency of investment.

3.1 HYPOTHESES :

1. Real money balances are akin to other productive factors such as labour and capital and therefore, should be included as a productive factor in the aggregate production function. Increase in the absorption and use of real balances results in an efficient organisation of the production and market system; as a resullt labour and capital are retired form the function of exchange and are available for use in the production process itself.

   In essence, real balances have a marginal productivity which is positive and which decreases as the intensity of their use increases. The extent of their substitution for other productive factors depends, as in case of other inputs, upon their marginal productivity and the opportunity cost of holding them. However, the holding, by the public, of balance defined as M/P (where M is the nominal money stock and P, the general price level) can not be increased by increasing M, which is by and large, a policy variable. The demand for real balance is completely endogenous; irrespective of

the level of M, the public can - and usually does - adjust its holdings of real balances by changing P.

2. The development of the financial structure leads to specialization in the functions of saving and investment and thereby, to channelization of investible resources from less productive investment opportunities (in which the surplus units would be compelled to invest in the absence of a financial system) to more productive investment opportunities. This would increase the marginal productivity of the aggregate capital stock.

3. Financial development would result in increase in the saving propensity in economically backward societies. This thesis is based on the premise that savers are not always the best investors; further, they are not always ready to make their savings directly available to the investors because of the difference in their risk aversion, desired maturity pattern, etc. Thus in a society without a financial system, the savers would have no incentive to save more than they can efficiently invest and the investors would not be able to save enough to self finance all their desired incestments. The surplus units would therefore tend to over-consume and investors would be forced to under invest. The development of an efficient financial system would encourage and help the savers to save to their desired level by offering to them a wide range of financial instruments to match their risk, return and liquidity preferences with those of the investors. Further, by the sheer size of their portfolio, the financial institutions can pool the risk and minimize the spread between the lending and deposit rates, thereby making saving more attactive.

4. The orthodoxy of the fifties and sixties was that interest should be kept low to stimulate investment. Rising world inflation in the late sixties and seventies focused intention on the detrimental effect of the negative interest rate on the allocation of the resources, the distribution of resources and mobilization of the savings, As a result, policy recommendation is that lending and deposit rates should be positive in real terms and Intermediation spread should provide an adequate return to the financial institution.

5. The rate of physical capital accumulation has always been accorded a major role as a source of economic growth. Regarding the determinants of physical capital formation,

two approaches can be identified, the first is the "financial structurralist" view which maintains that a widespread network of financial institutions and a diversified array of financial instruments will have a beneficial effect on saving investment processes and hence, on growth. The other is the `financial repressionist' view which considers low real interest retes, caused by arbitrarily set ceilings on nominal interest rates and high and variable inflation rates, as being the major impediments to financial deepening, capital formation and growth. According to Mckinnon, in a self-financed economy where indivisibilities in investment are important, real cash balance serve as a `conduit for capital formation. The basic idea is that in such an economy, accumulation of real cash balances must precede accumulation of physical capital. But since the demand for real cash balance is postulated to be positively and significantly related to the real rate of return on such balances, it immediately follows that capital formation is a positive function of this rate of return and this is the `complementarity hypothesis' of Mckinnon.

The Neo-Liberal school emphasize that increased degree of financial intermediation will make allocation of resources more efficient. This will require an examination of the allocative implications of financial intermediation. One approach would be to estimate rates of return ot capital in different sectors and then try to ascertain the extent to which these differencs can be ascribed to financial intermediation.

An alternative approach would be to use the marginal capital output ratio as a proxy for resource allocation efficiency and statistically, it should be regressed on variables reflecting financial intermediation and repression.

3.2 Money and Growth : Neo-Classical Approach

The identification of the role of money in economic growth has recently originated in the economic theory. Partly because of the difficulties in building a conceptual framework that can find money its proper place in economic processes and partly because of the assumptions that have become the basis for the conventional value theory, this problem was largely ignored by economists till the early 1960s.

As Clower[77] pointed out recently, most of the theoretical structure in economics today stands on the conventional value theory which "is essentially a device for the logical analysis of 'virtual trades' in a world where individual economic activities are costlessly coordinated by a Central Market Authority. It has nothing to say whatever about the timing or frequency of market transaction, about search, bargaining, information and other trading costs, or about countless other commonplace features of the real world trading processes". Consequently, even though the importance of money as a mechanism of payments was recognized right from Marshall and Fisher its role in the real economic processes was disguised under the veil of "neutrality of money" in the short and long run.

Only recently with the rise of new Monetarism the long run implications of money and its contributions to growth received a fresh consideration from economists. Though it was Bailey[78] who first recognized the importance of money in production, a systematic treatment to the impact of the introduction of money in a barter economy on the long run behaviour of per capita output, capital intensity, and wage rate was undertaken only after the pioneering attempts of Tobin[79].

The neo-classical approach to the role of money in growth is based on the treatment of real money as being the wealth of society and not as the debt of the monetary system, and the emphasis on the importance of money in reducing costs of transactions. Because money is universally accepted medium of exchange, both consumers and producers find it convenient to keep a certain amount of money on hand. This "convenience yield" of money makes it a producer as well as a consumer good.

Clower[80] argued that the difference that existed between a barter and a monetized economy was one of kind and not of degree. The Walrasian general equilibrium theory could not capture the fundamental distinction between a barter and a monetized economy because it treated money just as an $(n+1)^{th}$ commodity not materially different from any of the other n commodities. Hicks[81] emphasized this point by arguing that the Walrasian framework could

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[77] R. Clower, "Is there an Optimal Money Supply?", in Frontiers of Quantitative Economics, Vol. I, Intrilligator (ed.), Amsterdam, North Holland Publishing Co., 1974

[78] Martin Bailey, National Income and the Price Level : A Study in Macro Theory, New York, McGraw Hill, 1962, pp. 59-60

[79] James Tobin, "Money and Economic Growth", Econometrica, 33, 1965, p.671

[80] R. Clower, "A Reconsideration of the Micro Functions of Monetary Theory", Western Economic Journal, VI, (1967), pp. 1-9.

[81] J.R. Hicks, Critical Essays on Monetary Theory, London, Oxford University Press, 1972, pp. 6-9

generate a general equilibrium in a barter economy which according to the criteria of the conventional value theory is as efficient as an equilibrium attained by a monetized economy. But this point is quite inconsistent since barter is a very inefficient organization where goods have to change many hands "not in order that they should be transferred from the original supplier to the ultimate demanded, but because they were needed to serve as intermediary commodities(Hicks, 1972[82])". This, according to Hicks, is the big flaw in the conventional value theory. The Walrasian Theory implicitly assumes that no cost (efforts and sacrifice) is involved in transactions this, though a fair simplification for many purpose is hopelessly misleading when our subject is money. Even the simplest exchanges incur some cost. A well organized market is more efficient than a badly organized market only because the cost of making transactions in the former is lower.

Once transaction costs are allowed for, the incentive to evolve a system that minimizes these costs becomes obvious. Standardization of one commodity that can be transferred at the least cost as an intermediary commodity is the most rudimentary form of this system and resembles a primitive monetary system. As markets expand and more economic units start producing for exchange, systems like the clearing house and banks come into existence. Though the operations are not without cost, the overall savings in the total cost of effecting the necessary trade makes these institutions profitable to society.

The basis of the neo-classical approach to the role of money in growth is this basic function of money as a payment mechanism and a "temporary abode of purchasing power (Milton Friedman (1969[83])". It treats real money as the wealth to the society and an increase in it as its income. Though it does not have a direct role to play in production nor imparts any utility to a consumer in a "Robinson Crusoe" world, this is not true in a complex economic system where exchange is at least as important an activity as production or consumption. In such a world, money makes life easier for producers and consumers by breaking the barriers of space and time, making possible the emergence and better organization of markets for commodities and factors and most importantly by giving to its holders access to organized markets where they can transact at much lower costs.

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[82] Ibid

[83] Milton Freidman, "Optimum Quantity of Money", Friedman (ed.), Optimum Quantity of Money and Other Essays, Chapter 1, Chicago, Aldine Publishing Co., 1969.)

As an efficient payments' mechanism, money saves efforts of search and bargain, gathering information about the exchange possibilities, and bringing about a double coincidence of wants that its holder will be forced to make in its absence. This makes it possible to view money as producer good or a factor of production. It effects savings in labour and capital that will have to be spent in organizing production and exchange in the absence of money. So like labour and capital, money has a marginal productivity at the aggregate level which is positive and decreases as the intensity of the use of money increase.

These characteristics also make money a consumer good. It generates a stream of utility to its holders which can also be seen as the "convenience yield" of the holdings of real balances which usually consists of security and certainty associated with the use of money as an abode of purchasing power and ready and inexpensive access to organized markets made possible by the liquidity of money balances, etc. Thus additions to the holdings of real money generate marginal utility which is positive and decreases as the stock of real balances increases. Notable among those who made this point before are saving. (Thomas R. 1971)[84], Brunner and Meltzer (1971)[85], Hirschleifer (1970)[86], Neihans (1971)[87], Fiege and Parkin (1971)[88], etc.

3.3 Role of Money in "Lagging Economies" - Shaw-McKinnon Approach

A less rigorous and less elegant but more illuminating and realistic approach to the role of money in economic development has recently been developed by Edward Shaw (1973)[89] and Ronald McKinnon (1973)[90]. Their approach is primarily designed to analyse the role of money and finance in "lagging economies", which stand in clear contrast to the neo-classical regime. Whereas in the neo-classical world, output, capital, and labour are homogenous, there is a continuous equilibrium in all markets, an absence of risk and

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[84] Thomas R. Saving, "Transaction Costs and Demand for Money", American Economic Review, LXI, 61, 1971, p. 407.

[85] Karl Brunner and Allen Meltzer, "The Uses of Money : Money in a Theory of Exchange", American Economic Review, LXI, 5, 1971, p. 784.)

[86] J. Hirschleifer, Investment, Interest and Capital, New York, etc., Parentice-Hall Inc., 1970.

[87] Jurg Neihans, "Money and Barter in General Equilibrium with Transactions Costs", American Economic Review, LXI, 6, 1971, p. 773.

[88] E.L. Fiege and M. Parkin, "The Optimal Quantity of Money, Bonds, Commodity Inventory and Capital", American Economic Review, LXI, 3, 1971, p.335.

[89] Edward Shaw, Op.cit., p.48.

[90] Ronald McKinnon, Op.cit., p.48

uncertainty, and a perfect foresight into the future, a lagging economy is characterized by fragmented capital and labour markets, a spectrum of prices prevailing in all markets, presence of risk and uncertainty and imperfect foresight, a continuous, imperfect adjustment of expected prices and rates of return to unpredictable changes in prices and yields, high cost of information and the subsequent widespread ignorance about markets, and lack of mobility. Diffusion of technology is low and expensive. Investment opportunities are not homogenous and riskless in lagging economies.

In such an imperfect world, the role of money and finance is entirely different. Real money is not counted here as social wealth nor increase in real money as social income. There is a difference between savers and investors, and money and finance are not costless as factor inputs. The Shaw-McKinnon approach specifies a production function where money does not appear as a factor but as an industry which uses some labour and capital and a technology, and the output of this industry is an intermediate input into all other industries. "Balances of real money both extend the boundaries of markets and release labour and physical capital in the search and bargain process and from the "abodes of purchasing power".

Because this approach treats money as the debt of the monetary system and net as social wealth, the negative substitution effect between money and capital is ruled out. Instead there is a dual income effect of growth in real money. A negative income effect arises from the use of labour and capital by the money industry. On the other hand, there is a positive income effect that consists of the contribution of growth in real balances to the average and marginal products of factors producing income. "Growth in the stock of real money extends the production possibilities within any constellation of related markets, and it makes feasible, the extension of market boundaries (Edward Shaw, 1973)[91]".

The function of the monetary sector and the non- monetary financial institutions sector is to attract the savings of the surplus sector by issuing their own debt including money on the one hand and apply these savings to their accumulated physical capital and to the accumulation of deficit sectors in exchange for their primary securities. Thus the desired savings are in part demand for increases in real balances and other financial assets and desired investment is supply in part of increase in primary securities. The monetary system and other financial institutions satisfy both these desires by intermediation for which they

[91] Edward Shaw, Op.cit., p.48

earn a share in total gross income depending upon their loan rate 'r' and their holdings of primary securities of the deficit sector. On the other hand, they incur costs on labour and other inputs and pay interest to the money holders at real rate 'd'. The difference between 'r' and 'd' measures the unit cost of maintaining the payments mechanism and intermediation, reward for risk taking to the shareholders of the monetary system, and monopoly power. Reducing this gap is the objective of the monetary policy but reducing it to zero is not possible in a lagging economy as in this economy monatization and intermediation are not costless and risk-free.

The Shaw-McKinnon approach suggests that social welfare will unambiguously be higher in a monetized economy than in a barter economy because it does not recognize the substitution effect of increase in real balances. Increase in real balances yield a positive social utility at margin which decreases as the stock of real balances relative to wealth increase.

Again, there is a much mere rational base for the theory of demand for money in the lagging economy of Shaw-McKinnon than in a neo-classical world. In fact there is no reason why anybody would demand money in a neo-classical world where output is putty and wealth is riskless to hold and costless to move, and hence the marginal product of real balances is zero for all levels of real balances.

The situation is quite different in a lagging economy where only money is acceptable as a medium of exchange at a uniform price in the unit of account. The basis for demand for money in such an economy is its usefulness in clearing the "payments matrix", when presence of risk and uncertainty are granted, the chances of default by a spending unit decreases as the holdings of real balances increase because of the latter's liquidity. The risk of default can be reduced in other ways, but in most situations they are more expensive than keeping real balances in one's portfolio. These services of money in reducing the risk of default also diminish as the stock of real money increases relative to wealth. As a substitute for physical investment and other forms of investment, saving in the form of real balances is less risky, less costly, and more liquid (J. Tobin, 1958)[92].

The real yield on the holdings of real balances, (u+d-p) consist of an implicit yield 'u' which refers to the above mentioned services of money as a payments mechanism and abode

[92] J. Tobin, "Liquidity PReference as Behaviour Towards Risk", Review of Economic Studies, XXV, 3, 1958.

of purchasing power and an explicit yield that has two parts a real deposits rate 'd', if any, paid on real balances, and the '-p', the rate of deflation of price level. Any policy that reduces this composite rate of return reduces the demand for money, obstructs the working of the monetary system as payments mechanism and a conduct of saving and forces the economy to revert back to barter and fragmented markets. It necessitates greater diversion of real resources, like labour and capital to affect necessary trade and clear the payments matrix and so output is adversely affected.

Thus the Shaw-McKinnon approach suggests clearly that increases in real balances have a definite positive effect on social welfare and income as long as a lagging economy does not fully acquire the characteristics of a neo-classical economy.

3.4 Real Money Balances as a Factor of Production : Some Econometric Evidence for India

The theoretical aspects of the role of money in economic growth and development showed that both the neo-classical and the Shaw-McKinnon approaches grant the existence of a positive income effect of increase in real balances in output and welfare because of the increase in exchange efficiency and the resultant saving of labour and capital resources made possible by money. To this extent money can be considered as a factor of production and has its rightful place in the aggregate production function (M. Friedman, 1969[93] H.G. Johnson, 1966[94] D. Levhari & D. Patinkin, 1968[95]).

This proposition is all the more attractive because only this aspect of monetary growth theory is amenable to some empirical tests, Little empirical work whatsoever on any aspects of monetary growth theory exists.

This section has reported the results of a similar exercise we conducted using the time series data for India between 1951-52 to 1992-93 and also the sub-periods. We have also estimated a simple Cobb-Douglas production function which in log terms looks like :

$$Y = A \cdot L^a \cdot K^b \cdot M^a \cdot u$$

$$\log Y = \log A + a \log L + b \log K + d \log M + u$$

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[93] Milton Friedman, "Optimum Quantity of Theory," Friedman (ed.), Optimum Quantity of Money and Other Essays, Chicago, Aldine Publishing Co., 1969.

[94] H.G. Johnson, "The Neo-Classical One Sector Growth Model : A Geometrical Exposition and Extension to a Monetized Economy", Economica, XXXIII, 1966, p.116.

[95] D. Levhari and D. Patinkin, "Role of Money in a Simple Growth Model", American Economic Review, LVII, 4, 1968, p.713.

Where Y, L and K are Real Net Domestic Product, total labour input and total capital stock, M denotes stock of real balances. Two definitions of real balances are used. M_1 refers to currency and demand deposits + other deposits and M_3 refers to currency, demand deposits and time deposits.

Data on indices of Y, L, and K are obtained from Dholakia's and also National Accounts, Statistics study on "Sources of Economic Growth in India, "and that on M_1 and M_3 are obtained from RBI Bulletins, Nominal money stock has been deflated by the wholesale price index to obtain stock of real balances.

The estimates of the coefficients, t ratios, R^2 and R^2, Durbin Watson Statistic and the returns to scale parameters are reported in Tables. The table also shows the marginal product of money MPM for two definitions obtained at sample means of real absolute NDP and real balances. The table shows that all the regressions have excellent fits in general explaining more than 98 percent of variations in real NDP. The introduction of money in all the three definitions increases the explanatory power of the equations as shown by the values of R^2 and especially R^2 which is one factor that justifies the introduction of real balance in production. Real balances, however defined, enter production function extremely significantly as shown by their ratios. The coefficient of M_3 is the largest.

It becomes readily noticeable that in India, real balances affect the coefficients of both labour and capital significantly. Both M_1 and M_3, when introduced in the production function, have the labour saving and capital saving bias and thus release part of labour and capital which could be need for further production. There are increasing returns to scale with labour and capital and also with M_1 for the whole period but decreasing returns to scale with M_3; However for the sub-periods, In all regression, there are increasing returns to scale; The returns to scale parameter decreases after the introduction of M_1 and M_3 mainly because of the reduction in the size of capital and labour elasticity of returns to scale are explained by labour in the regression without real balances, 98 percent with labour and M_1 and 99 percent with labour and M_3. Real Balances mainly dispute the services of labour and capital both. For the sub-periods, however, Real Balances seem to replace services of labour; They have a labour saving bias. During high rates of inflation, money as a payments mechanism becomes expensive, so firms substitute either labour or capital for money. More frequent wage payments, for instance, may increase the accounting work so that more skilled labour has to

be employed. Whether labour or capital is replaced by the increasing use of money will depend upon the relative factor endorsements position and factor productivity and costs.

Another factor worthy of attention is the change in D.W.S. Durbin Watson statistics after the introduction of real balances. The very low value of D.W.S. shows that there is a first order positive serial correlation present in the regression without real balances. However, all the regression with real balances as an additional variable have no autocorrelation at all if the main cause of serial correlation is the omission of some relevant variable, then the absence of autocorrelation in the regression with real balances strengthens the case for including real balances in the production function. The marginal product of real balances with M_1 and M_3 for the whole period are 1.57 and 0.98 respectively; For the sub-period 1951-52 to 1970-71, marginal product for M_1 is 0.67 and that for M_3 is 0.65; For the more recent period 1970-71 to 1991-92, they have fallen to 0.36 and 0.37 respectively. This is consistent with the fact that as the intensity of use of real balances increases, the marginal product will go on declining.

For agricultural GDP, M_1 and M_3 are not found to be statistically significant; instead, credit to agriculture is found to be significant. On the other hand, for industry M_1 and M_3 are found to be statistically significant along with credit to industry variable.

Cobb - Douglas Production Function

Period 1951 - 52 to 1990 - 91

{1}

Log Y = f (logK , logL)
Y = -4.6 +0.27(K) + 1.53

Y = GDP at Constant Prices
K = Capital Stock
L = Labour Force

Log Y = -4.6 + 0.27 logK + 1.53logL
(-4.0)(6.1) (6.1)

$R^2 = .90$
$R^2 = .89$

{2}

Logy = f (logK , logL , logM_1/P)

Logy = -.38 + .59logL + .01logK + .72logM_1/P

(-.48) (3.5) (3.2) (9.3)

$R^2 = .97$
$R^2 = .96$

{3}

$LogY = f(logL, logK, logM_3/P)$

$LogY = 1.9 + .26logL + .01logK + .50logM_3/P$

(2.2) (1.46) (2.6) (10.3)

$R^2 = .97$
$R^2 = .97$

{4}

$LogY = f(logL, logK, logCredit)$

$LogY = 2.7 + .25logL + .01logK + .23logCredit$

(4.8) (2.28) (.60) (17.7)

$R^2 = .99$
$R^2 = .98$

{5}

$LogYagri = f(logL^{\wedge}, logK^{\wedge})$

$LogYagri = -11.4 + .4logL^{\wedge} + 2.8logK^{\wedge}$

(-5.4) (.55) (7.3)

$R^2 = .98$
$R^2 = .98$

{6}

$LogYagri = f(logL^{\wedge}, logM1/P, logK^{\wedge})$

$LogYagri = -11.3 + .43logL^{\wedge} + 0.4logM1/P + 2.8logK^{\wedge}$

(-5.3) (-.57) (.20) (5.3)

$R^2 = .98$
$R^2 = .98$

{7}

$\text{Log Yagri} = f(\log L^{A}, \log M3/P, \log K^{A})$

$= -11.8 + .14\log L^{A} - .16\log M3/p + 3.36\log K^{A}$

(5.5) (0.18) (-.8) (4.7)

$R^2 = .98$
$R^2 = .98$

{8}

$\text{LogYagri} = f(\log L^{A}, \log \text{Credit}^{A}, \log K^{A})$

$= -7.4 + .30\log L^{A} + .11\log \text{Credit}^{A} + 2.1\log K^{A}$

(-3.2) (.45) (3.0) (4.7)

$R^2 = .98$
$R^2 = .98$

{9}

$\text{LogY}^{I} = f(\log K^{I}, \log L^{I})$

$= -2.4 + 1.4\log K^{I} - .02\log L^{I}$

(-5.6) (26.5) (-.26)

$R^2 = .95$
$R^2 = .95$

{10}

$\text{LogY}^{I} = f(\log K^{I}, \log L^{I}, \log M1P)$

$= -3.1 + .76\log K^{I} - .01\log L^{I} + 1.55\log M1/P$

(-8.7) (5.7) (-.27) (5.1)

$R^2 = .97$
$R^2 = .97$

{11}

$LogY^I = f(logK^I , logL^I , logM3/P)$

$= -1.18 + .50logK^I - .01logL^I + 1.25logM3/P$

(-4.2) (4.5) (-1.8) (8.8)

$R^2 = .98$
$R^2 = .98$

{12}

$LogYI = f(logCredit^I , logL^I , logK^I)$

$= 2.6 + 1.25logCredit^I + .10logL^I - .81logK^I$

(3.4) (7.1) (2.1) (-2.5)

$R^2 = .98$
$R^2 = .97$

Period 1951-52 to 1970-71 (Sub-Period)

{1}

Log Y = f(logK , logL)

= -6.5 + .002logK + 2.14log L

(-8.1) (.06) (13.1)

$R^2 = .94$
$R^2 = .93$

{2}

$Logy = f(logK , logL, logM_1/P)$

= -5.1 + 1.75logL + 0.1logK + .30logM1/P

(-5.2) (7.4) (.30) (2.1)

$R^2 = .95$
$R^2 = .94$

{3}

$LogY = f(logL, logK, logM_3/P)$

$= -3.46 + 1.42logL + .005logK + .31logM_3/P$

(-2.7) (5.1) (.23) (2.8)

$R^2 = .96$
$R^2 = .95$

{4}

$LogY = f(logL, logK, logCredit)$

$= 1.3 + .5logL - .003logK + .24logCredit$

(.7) (1.3) (-.16) (4.4)

$R^2 = .97$
$R^2 = .96$

{5}

$LogYagri = f(logL^A, logK^A)$

$= -5.8 + -2.3logL^A + 4.7logK^A$

(-.7) (-.55) (1.67)

$R^2 = .91$
$R^2 = .90$

{6}

$LogYagri = f(logL^A, logM1/P, logK^A)$

$= -4.6 - 4.3logL^A - 1.5logM1/P + 7.5logK^A$

(-1.1) (-2.1) (-7.1) (5.2)

$R^2 = .98$
$R^2 = .97$

{7}

$\text{Log Yagri} = f(\log L^{A}, \log M3/P, \log K^{A})$

$= -21.3 + 1.9\log L^{A} - 1.3\log M3/P + 4.0\text{og}K^{A}$

(-5.1) (1.0) (-8.0) (3.1)

$R^2 = .98$
$R^2 = .98$

{8}

$\text{LogYagri} = f(\log L^{A}, \log \text{Credit}^{A}, \log K^{A})$

$= -23.6 + 9.0\log L^{A} + .22\log \text{Credit}^{A} - 4.2\log K^{A}$

(-3.4) (2.4) (4.5) (-1.5)

$R^2 = .96$
$R^2 = .95$

{9}

$\text{Log}Y^{I} = f(\log K^{I}, \log L^{I})$

$= .26 + .89\log K^{I} - .13\log L^{I}$

(.21) (13.3) (-.44)

$R^2 = .96$
$R^2 = .95$

{10}

$\text{Log}Y^{I} = f(\log K^{I}, \log L^{I}, \log M1P)$

$= 1.6 + 1.1\log K^{I} - 0.25\log L^{I} - 0.69\log M1/P$

(1.2) (10.1) (-0.88) (-1.96)

$R^2 = .96$
$R^2 = .96$

{11}

$LogY^I = f(logK^I, logL^I, logM3/P)$

$= 1.80 + 1.30logK^I - 0.37logL^I - 0.93logM3/P$

(1.5) (8.0) (-1.3) (-2.6)

$R^2 = .97$
$R^2 = .96$

{12}

$LogY^I = f(logCredit^I, logL^I, logK^I)$

$= 1.87 + 0.50logCredit^I - 0.80logL^I + .09logK^I$

(2.8) (6.9) (-0.5) (.75)

$R^2 = .99$
$R^2 = .98$

Sub-period 1971-1993

{1}

Log Y = f(logK , logL)

= -3.2 + .16logK + 1.3log L

(-2.5) (.89) (3.26)

$R^2 = .97$
$R^2 = .97$

{2}

Logy = f(logL, $logM_1/P$, logK)

= -1.8 + 1.0logL + .17logM1/P + 0.20logK

(-1.2) (2.2) (1.7) (1.1)

$R^2 = .98$
$R^2 = .97$

{3}

$LogY = f(logL, logM_3/P, logK)$

$= -1.7 + 1.2logL + .2logM_3/P + .23logK$

(-1.2) (2.7) (1.6) (0.12)

$R^2 = .98$
$R^2 = .97$

{4}

$LogY = f(logL, logK, logCredit)$

$= 5.6 + .97logL - 1.5logK + .62logCredit$

(1.8) (2.63) (-2.6) (3.0)

$R^2 = .98$
$R^2 = .98$

{5}

$LogYagri = f(logL^A, logK^A)$

$= -10.0 + -.01logL^A + 2.9logK^A$

(-1.3) (.04) (3.7)

$R^2 = .94$
$R^2 = .93$

{6}

$LogYagri = f(logL^A, logM1/P, logK^A)$

$= -11.4 + 1.1logL^A + .69logM1/P + 1.8logK^A$

(-1.7) (.6) (2.5) (2.1)

$R^2 = .96$
$R^2 = .95$

{7}

$\text{Log Yagri} = f(\log L^{A}, \log M3/P, \log K^{A})$

$= -5.5 - .05\log L^{A} + .47\log M3/P + 1.89\log K^{A}$

(-.74) (-.024) (1.7) (1.9)

$R^2 = .95$
$R^2 = .94$

{8}

$\text{LogYagri} = f(\log L^{A}, \log K^{A}, \log \text{Credit}^{A})$

$= 14.37 - 3.6\log L^{A} + 1.6\log K^{A} + .41\log \text{Credit}^{A}$

(1.22) (-1.5) (1.8) (2.4)

$R^2 = .96$
$R^2 = .95$

{9}

$\text{LogY}^{I} = f(\log K^{I}, \log L^{I})$

$= -3.8 + 1.7\log K^{I} - .04\log L^{I}$

(-6.3) (6.9) (-.3)

$R^2 = .96$
$R^2 = .95$

{10}

$\text{LogY}^{I} = f(\log K^{I}, \log L^{I}, \log M1P)$

$= -3.8 + 1.7\log K^{I} - 0.3\log L^{I} - 0.7\log M1/P$

(-6.2) (5.0) (-0.24) (-.14)

$R^2 = .96$
$R^2 = .95$

{11}

$LogY^I = f(logK^I , logL^I , logM3/P)$

$= -2.4 + 1.2logK^I - 0.08logL^I + 0.74logM3/P$

(-3.3) (3.0) (-.62) (-2.5)

$R^2 = .97$
$R^2 = .96$

{12}

$LogY^I = f(logCredit^I , logL^I , logK^I)$

$= 1.48 + 1.40logCredit^I - 0.20logL^I - .42logK^I$

(2.2) (8.5) (-2.8) (-1.5)

$R^2 = .99$
$R^2 = .99$

Table 3.1 : Estimates of parameters of Cobb-Douglass production function with real Balances as an additional factor : Indian Economy (Period 1950-51 to 1991-92)

$$\text{Log } Y_t = \text{Log } A + \alpha \text{ Log } L_t + ß \text{ Log } K_t + d \text{ Log } M_t + u_t$$

	(1)	(2) M_1	(3) M_3
Log A	-4.6	-0.38	1.9
	(-4.0)	(-0.48)	
α	1.53	0.59	0.26
t - value	(6.1)	(3.5)	(1.46)
ß	0.27	0.011	0.011
t - value	(6.1)	(3.2)	(2.6)
d		0.72	0.50
t - value		(9.3)	(10.3)
$\alpha + ß + d$	1.80	1.32	0.77
R^2	0.90	0.97	0.97
$\bar{R}^2$	0.89	0.96	0.97
D.W.S.	1.48	2.55	2.38
Y/M = Marginal Product of money		1.57	0.98
$M_1 = 2.28$			
$M_2 = 2.54$			
$Y = 4.98$			

Table 3.2 : Estimates of parameters of Cobb-Douglass production function with real Balances as an additional factor : Indian Economy (Period 1950-51 to 1970-71)

$$\text{Log } Y_t = \text{Log } A + \alpha \text{ Log } L_t + ß \text{ Log } K_t + d \text{ Log } M_t + u_t$$

	(1)	(2) M_1	(3) M_3
Log A	-6.5	-5.1	-3.46
	(-8.1)	(-5.2)	(-2.7)
α	2.14	1.75	1.42
t - value	(13.1)	(7.4)	(5.1)
ß	0.10	0.11	0.14
t - value	(1.8)	(2.0)	(2.03)
d		0.30	0.31
t - value		(2.1)	(2.8)
$\alpha + ß + d$	2.24	2.16	1.87
R^2	0.94	0.96	0.97
R^2	0.93	0.95	0.96
D.W.S.	1.62	2.01	2.11
Y/M = Marginal Product of money		0.67	0.65
$M_1 = 2.13$			
$M_2 = 2.28$			
$Y = 4.80$			

Table 3.3 : Estimates of parameters of Cobb-Douglass production function with real Balances as an additional factor : Indian Economy (Period 1971-72 to 1992-93)

$\text{Log } Y_t = \text{Log } A + \alpha \text{ Log } L_t + ß \text{ Log } K_t + d \text{ Log } M_t + u_t$

	(1)	(2) M_1	(3) M_3
Log A	-3.2	-1.8	-1.7
α	1.3	1.0	1.2
t - value	(3.26)	(2.2)	(2.7)
ß	0.16	0.20	0.23
t - value	(0.89)	(1.8)	(1.9)
d		0.17	0.20
t - value		(1.9)	(2.0)
$\alpha + ß + d$	1.46	1.37	1.63
R^2	0.96	0.98	0.98
$\bar{R}^2$	0.95	0.97	0.97
D.W.S.	1.71	1.92	1.88
Y/M = Marginal Product of money		0.36	0.37
$M_1 = 2.41$			
$M_2 = 2.76$			
$Y = 5.11$			

Table 3.4 : Estimates of parameters of Cobb-Douglass production function with real Balances as an additional factor : Indian Economy (Period 1950-51 to 1991-92)

Agriculture

$$\text{Log } Y_t = \text{Log } A + \alpha \text{ Log } L_t + ß \text{ Log } K_t + d \text{ Log } M_t + u_t$$

	(1)	(2) M_1	(3) M_3	(4) Credit
Log A	-11.4	-11.3	-11.8	-7.4
α	0.40	0.43	0.14	0.30
t - value	(0.55)	(0.57)	(0.18)	(0.45)
ß	2.8	2.8	3.36	2.1
t - value	(7.3)	(5.3)	(4.7)	(4.7)
d		0.40	-0.16	
t - value		(0.20)	(-0.8)	
e				0.11
t - value				(3.0)
$\alpha + ß + d$	3.20	3.63	3.34	2.51
R^2	0.98	0.98	0.98	0.98
R^2	0.98	0.98	0.98	0.98
D.W.S.	1.61	1.73	1.8	1.9

Table 3.5 : Estimates of parameters of Cobb-Douglass production function with real Balances as an additional factor : Indian Economy (Period 1950-51 to 1991-92)

Industry

$\text{Log } Y_t = \text{Log } A + \alpha \text{ Log } L_t + ß \text{ Log } K_t + d \text{ Log } M_t + u_t$

	(1)	(2) M_1	(3) M_3	(4) Credit
Log A	-2.4	-3.1	-1.18	2.6
α	0.08	-0.01	-0.01	0.10
t - value	(0.26)	(-0.27)	(-1.8)	(2.1)
ß	1.4	0.76	0.50	-0.81
t - value	(26.5)	(5.7)	(4.5)	(-2.5)
d		1.55	1.25	
t - value		(5.1)	(8.8)	
e				1.25
t - value				(7.1)
$\alpha + ß + d$	1.48			
R^2	0.95	0.97	0.98	0.98
R^2	0.95	0.97	0.98	0.97
D.W.S.	1.32	1.49	1.77	2.01

3.5 Theoretical Framework

The analysis of Gurley and Shaw emphasizes mainly the increase in the allocative efficiency of the saving investment process brought about by efficient financial intermediation. This analysis understates the importance of money and finance in the development of under-developed countries where money and capital markets are fragmented and highly imperfect, economic opportunities are not properly perceived, cost of information is high, the consequence of alternative economic actions are difficult to predict, and the risk of uncertainty attached to the gains and losses of these consequences high. In brief, the economic system lacks the fluidity and organization conducive to the strengthening of the growth forces (Charles Wolf, 1964)[96]. In these economies, transactions are mainly of barter type, a large

[96] Charles Wolf, Jr., "Institutions and Economic Development," in R. Richardson and B. Okum (Ed.), Studies in Economic Development, New York, (Holt, Rinehart, and Winston, 1964), p.358.

portion of the savings occurs in physical : forms, the economic policies are predominated by policies repressing money and finance (E.S. Shaw, 1973)[97].

Efficient monetary and financial intermediation will increase the saving propensity of the people. This can be demonstrated by exploring the transition of a primitive barter economy to a monetized economy and then to an economy with a full-fledged monetary and financial system.

3.6 Savings in a Barter Economy

A barter economy is characterized by imperfections in all markets. In fact, it is difficult to imagine a market in the real sense in a barter economy because a commonly accepted medium of exchange is a precondition for a market. Our model barter economy has some surplus units having an income exceeding the expenditure, some deficit units with expenditure exceeding the income, and some units with balanced budgets. Surplus units are obviously responsible for society's savings. Deficit units expenditure is mainly investments. Since there are no intermediaries who can collect the savings of surplus units and fund deficit units, the only possibility that can be allowed is direct lending and self-financed investments.

Because of imperfections in the economic system of such an economy, the cost of acquiring information about profitable investment opportunities is high. Lack of infrastructure increases the possibility of failures of industrial ventures. Geographical barriers and inefficient communication systems make it difficult to perceive economic opportunities. This makes direct investment by most of the surplus units virtually impossible.

For similar reasons, direct lending to the investors who have perceived a profitable investment opportunity will also be difficult.

Since in this society, the risk of failure of a venture arises primarily from environmental conditions, competent investors can do little to avoid this risk. Most surplus units will consume more in the present than they otherwise would because they will at margin compare the incremental value attached to extra consumption with their objective expectations of the rate of return which will be very low because of the low probability attached to a given rate of return. Thus, surplus units in a barter economy will tend to overconsume. Another

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[97] E.S.Shaw, Financial Deepening in Economic Development, Chicago, (Oxford University Press, 1973), pp. 88-112.

consequence is that earning a flow of income in future by foregoing present consumption will not be a predominant motive for savings. Thus people will hold savings at a level just enough to guard them against contingencies.

Physical assets will constitute the major savings in a barter economy. Physical assets do not earn a rate of return when they are to be used as conduit for wealth and not as a means to further production which is what will happen in the absence of a better conduit to store wealth.

Retaining purchasing power as physical assets causes inconvenience of two types. The first, physical inconvenience, emerges from the fact that, for lack of alternatives, land, buildings, inventories, and other inappropriate physical assets have to be used as conduit of saving. Physical assets in most cases are voluminous and have to be guarded against depreciation and damage, e.g., foodgrains and land. Precious metals and some other assets may not be suffering from any of these inconveniences but all of them, in term, are subject to economic incomenience in that the nominal value of these assets is not fixed nor predictable because it is determined by external economic conditions. Economic inconvenience of these assets occurs also because they are less liquid, not having a fixed or a predictable nominal value, less easily divisible, less movable, and less easily salable. Selling and buying these assets involve the cost of exchange, of creating a double coincidence of want for the asset. Most of these assets, like land, inventories, and buildings are immovable. Hence for these assets the market is geographically limited.

The economic and physical inconveniences of holding savings as physical assets and the cost involved in using physical assets as a conduit of saving become another major reason why people in this economy will keep their savings at the minimum necessary level.

3.7 Impact of Introduction of Money on Saving

When money is introduced in such a primitive barter economy, two fundamental changes occur. First, an organized commodity market emerges from the availability of a universally acceptable medium of exchange. The risk of failures of industrial ventures decreases since geographical barriers to the growth of markets are removed. Self-financed investment and direct lending will be effective competitors to present consumption at the margin so that the first reason for holding savings at the minimum level is done away with.

Second, money is an ideal or at least a far superior conduit of savings than physical assets. It is the simplest form of a financial assets. It serves both as a medium of exchange and a store of value. It is an indirect financial asset issued by the monetary authority to the public. Holding of money by an individual spending unit represents his abstinence from equivalent consumption -- an unused claim on the consumption or capital resources of the society -- as long as he holds that money. Money is the most liquid of all the assets-since its value is fixed in nominal terms. But, money is not a timebound claim, i.e., the holder of money balances has an option to liquidate his money assets and use his claim to acquire consumption goods or investment goods whenever he pleases. So when people hold money balances, the equivalent amount of resources at the disposal of the monetary authority and the banking system are, in theory, not supposed to be available for investment in physical capital accumulation which is why no interest is paid on money holdings. However, in real life, since not all money-holders are expected to liquidate their monetary claims at the same time, the monetary authority and the banking system can invest a part of the real resources of the public at their disposal in physical capital formation and earn a monopoly profit on it.

Though money does not earn a rate of interest, it is a distinctly superior conduit of saving than physical assets. Consequently its introduction in this economy enables the units using physical assets as a conduit of saving to hold their savings in money so that physical wealth will be released for further production which forms the famous Gurley-Shaw and Hugh-Patrick hypotheses.

But this is not all. When money is introduced into this economy, it will have the same impact on the individual utility functions of the surplus units as the introduction of a strikingly new product in the market. Consumers will acquire the new product partly by reducing their purchases of other commodities in their consumption basket and partly by reducing their savings. This happens primarily because the new choice set available to the consumer replaces his old schedule of preferences with a new one which results in a greater consumption and lower saving from the same budget. In exactly the same fashion, the introduction of money results in a totally new schedule of preferences that generates a higher level of total savings as money and physical assets at each income level. This happens because the availability of money removes constraints that led to the conventional attitude to hold savings at the minimum level since saving now is easy and without cost and riskless. Thus, the artificial

distortion in their preferred time pattern of consumption imposed by the non-existence of an appropriate conduit is removed.

In unstable economies with rising prices obviously this advantage of money is lost. In these economies, savings held as money balances erode at a rate of equal to the rate of inflation since the nominal value of money is fixed. On the other hand, physical assets appreciate in value and so earn to their owners, windfall gains. This sets a monetized economy in its way back to barter since money does not remain a safe conduit to store wealth. The policy of inflation is thus a typical case of repressed finance since it encourages demonetization and makes it profitable to hold savings as physical assets because savings in money bear a physical cost equal to the rate of depreciation in the value of money and an opportunity cost equal to the rate of appreciation in the value of capital assets less the cost of saving in physical forms. The reverse is the case if there is a deflation in general price level.

Our hypothesis can be more clearly stated for an individual consumer. We first assume a barter economy in which the consumer having a one-period utility function allocates his income Y on C_0 of present consumption and C_1 of consumption next year or saving. We distinguish between two cases :

1. First we assume the absence of the lending borrowing possibility.
2. Second we allow for the possibility of direct lending by surplus units to deficit units.

CASE - I : When in a barter economy, the possibility of direct lending is ruled out, the consumer has the only alternative of holding his savings as physical assets. As we observed, when physical assets are used as just conduits for wealth and not for production, they earn a zero rate of return. The individual consumer, however, has to bear a positive cost of maintaining the asset. We denote the average carrying cost of the asset of unit value per year as K_f so that the net rate of return on his savings is $-K_f$.

Holding of money gives the consumer a control over the generalized purchasing power so that it becomes attractive as a consumer and an investment good. So when money is introduced in such an economy, two effects can be isolated.

If we assume that the marginal utility of money at its zero consumption level is higher than the equilibrium values of the marginal utilities of present and future consumption in the barter economy, then the consumer will increase his holdings of money till the utility at

margin from money, present consumption, and future consumption is equal. This means that in the new equilibrium in the money economy, the consumer will allocatse a smaller part of his income among present and future consumption to hold money. The introduction of money will reduce present consumption and increase his savings which will now be held only as money. This is the consumption replacing effect of the introduction of money.

Since money bears a zero rate of return as compared to physical assets that bear a negative rate of return, the budget constraint of the consumer will expand and he will save a greater proportion of this income. This is the investment effect of the introduction of money. The following simple diagram explains these two effects.

In this diagram, present consumption C_p is measured on the vertical axis and the consumption in the next period C_1 on the horizontal axis. The line denoted by $r = -K_f$ is the budget line of the consumer with a slope equal to $1/1-K_f$. Indifference curve I^o_1, showing his preferred temporal consumption pattern along with the budget constraint gives C_1 of saving.

When money is introduced, first the budget constraint of the consumer expands to r=0 with a unitary slope. The possibility of avoiding the cost K_f of carrying the physical asset in which savings are held will induce consumer his saving from C^1_1 to C^2_1. This, however, accounts for only the investment effect. The availability of money will shift the consumer utility function so that for a given value of his income and rate of return on his savings, his consumption expenditure will decline. This is shown by the Indifference curve I^1_1 which a member of the family of new indifference curves. Because of this the savings will increase further to C^3_1. This is because of the consumption replacing effect.

CASE - II : Here we take account of the possibility of lending and borrowing even in a barter economy. If the net rate of return on direct lending $r_f = 0$, then direct lending becomes an attractive investment opportunity as compared to direct investment in a physical asset with the net rate of return equal to - K_f. In this case the investment effect of the introduction of money will be zero but the consumption replacing effect will still lead to higher saving.

The introduction of money in this case does not affect the budget line since the rate of return on direct lending or investment in money is zero. Because of the consumption replacing effect, savings will increase from C^1_1 to C^2_1. The consumer will hold all his savings in money because though the opportunity cost of holding money is zero it is a far better conduit than physical assets.

DIAGRAM - 1

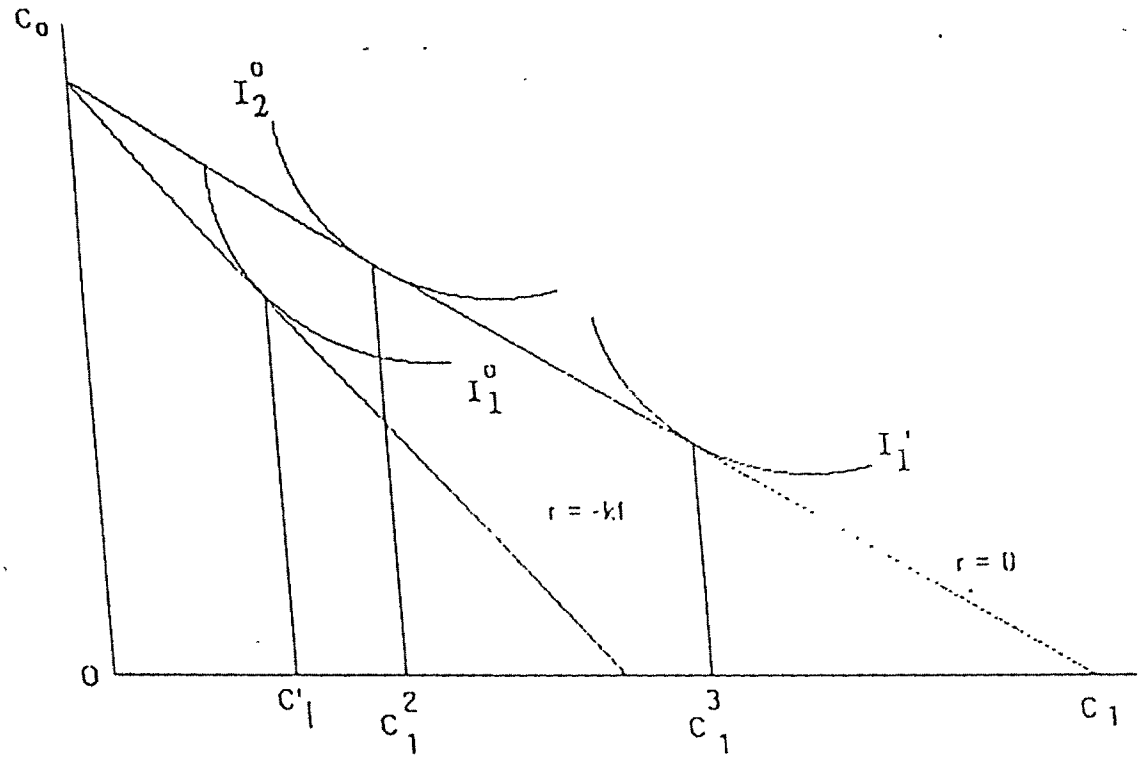
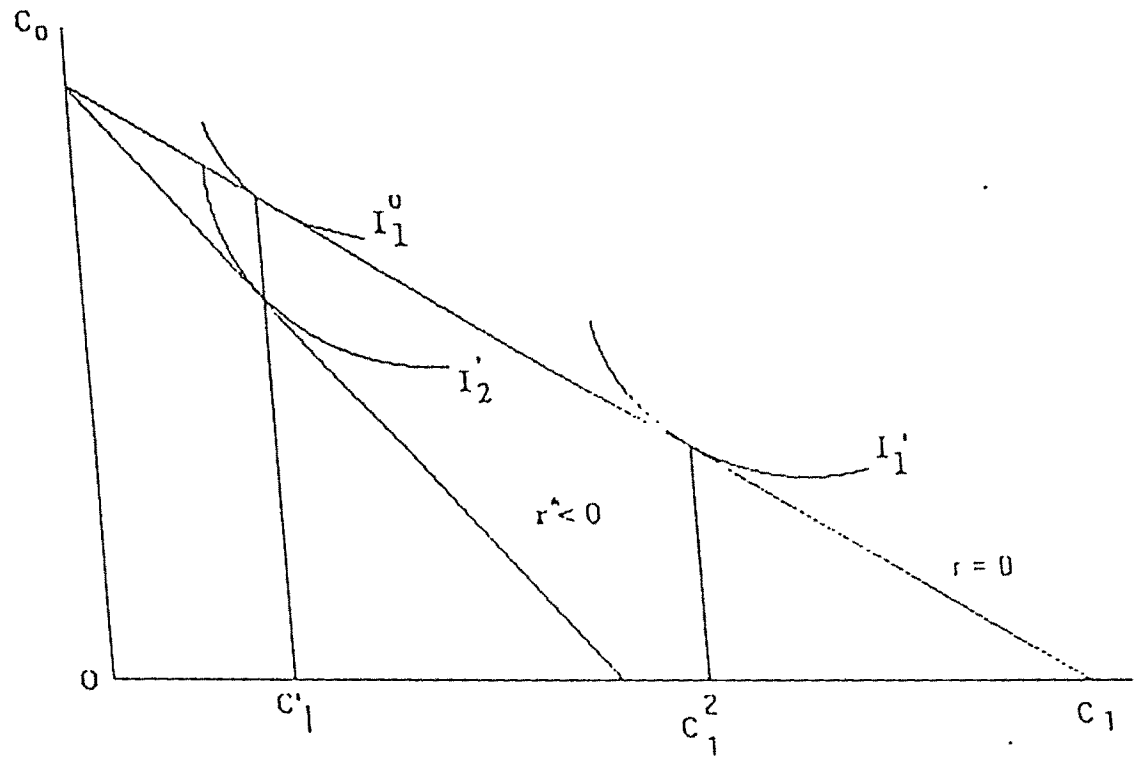


DIAGRAM - 2



There should be some rate of return $r^* < 0$, for which the consumer will reduce his savings in the monetized world C^2_1 to his savings level in the barter economy, i.e., C^1_1. This rate of return -r* denotes the cost that the consumer would be ready to bear for the use of money as a conduit. This means that the consumer would at the margin equate imputed yield to the services of money as a conduit to the marginal opportunity cost of holding money in terms of the rate of return on direct lending. So long as r_f is less than -*, the consumer will keep investing some of his savings in money. But if $r_f > r^*$, then the consumer will lend all his savings and will not hold money at all. In real life individuals retain some of their savings as money. One may guess that the imputed value to the services of money must be quite high at the margin.

3.8 Non-Monetary Financial Assets and Saving

As a conduit of saving, non-monetary financial assets are as efficient as money except that they are less liquid. But, on the other hand, their introduction in a monetized economy brings forth another fundamental change. So far, surplus units could invest their surplus only in self-financed investment or lend it to someone who had the ability and willingness to invest. But, this means that over a period of time, the surplus units will accumulate illiquid bonds and their liquidity position will become a constraint on their direct lending. When non-monetary financial intermediaries emerge, the situation changes in a fundamental way. These intermediaries are "processing plants whose function is to turn primary securities into indirect securities for the portfolios of ultimate lender[98]". They can charge lower rates of interest to borrowers and pay higher deposit rates to savers and still profit by the transformation process by exploiting "economies of scale in lending and borrowing." On the lending side, the intermediaries can invest and manage investments in primary securities at unit cost far below the experience of most individual lenders. "The sheer size of their portfolio makes possible a significant reduction in risks through diversification. They can schedule maturities so that chances of liquidity crisis are minimized ... On the borrowing side, the intermediary with a large number of depositors can normally rely on a predictable schedule of claims for repayment and so can get along with a portfolio that is relatively illiquid[99]".

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[98] Gurley and Shaw, (1973) : Op.cit.

[99] Ibid.

Hence financial intermediaries can pay higher interest rates to holders of their financial assets than the latter can usually earn from direct investment or direct lending. This has an additional positive effect on the savings ratio since it further expands the opportunity set of the surplus units. Thus, financial intermediation not only increases the allocative efficiency of the saving-investment process but can raise the saving propensity.

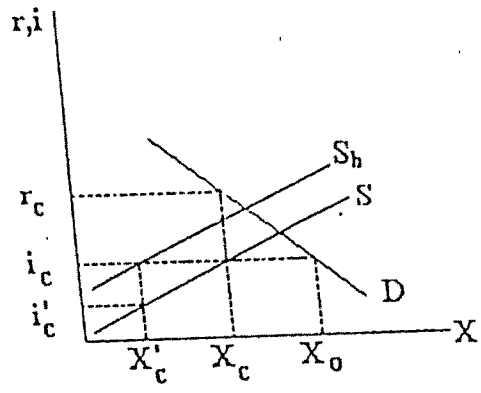
We have shown that an efficient monetary and financial structure may, for more than one reason, lead to higher savings ratio in a developing economy. But, this is just a once and for all kind of an effect, i.e., increase in the real money balances and variety of other financial assets to cater to the varied preferences of the people will have an effect only till such surplus units in the society achieve their optimal portfolio of money, other financial assets, and physical assets. Once this position is reached, a further growth in monetary and financial structure will not have any additional effect on the saving ratio.

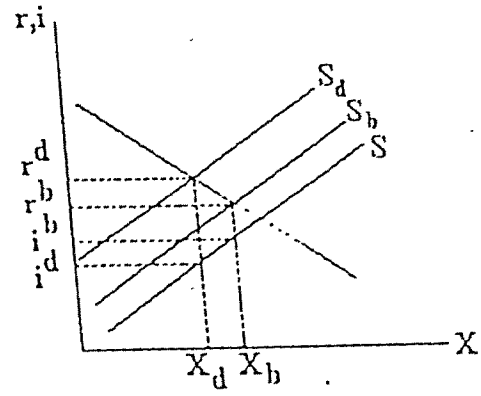
3.9 Financial Repression and financial intermediation

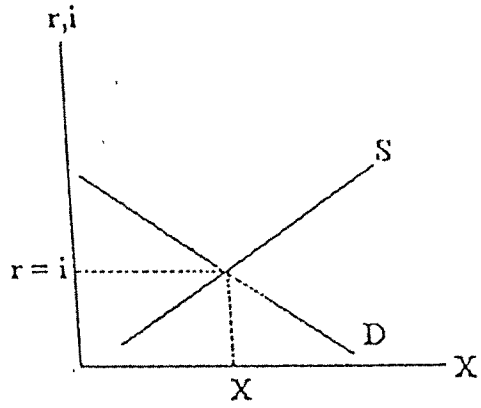
The impact of financial intermediation and interest rate ceilings on credit can be demonstrated geometrically. In the diagrams in diagram:3 the horizontal axis measures the quantity of borrowing or lending per unit of time (X), and the vertical axis measures the cost of borrowing (r) and the return for lending (i). The economy's demand for credit is depicted in the first diagram by the downward-sloping curve labeled d. Its negative slope reflects, in part, the increasing quantity (per unit of time) of profitable investment as the cost of borrowing declines. The upward-sloping curve labeled S depicts the economy's supply of credit, the amount of saving offered to others either directly or through intermediaries such as banks. Its positive slope reflects, in part, the increasing share of total saving provided for financial assets as their return rises relative to the return on real assets or investment abroad. If there were no transaction costs or interest rate regulations, the market-determined rate of interest would be r= i, and the amount of credit per period would be X.

It is costly, however, for lenders to locate credit worthy borrowers. In the center diagram, the amount lenders must charge borrowers to cover that cost is reflected in the curve Sd. The vertical distance between this curve and the supply of funds curve (S) is the amount of these transaction costs (including the cost of covering the expected defaults). If lenders had to find borrowers on their own, they would be willing to supply Xd in the expectation of earning (after deducting expected costs) id. For that amount of credit, borrowers would be paying rd.

DIAGRAM - 3 Financial intermediation and interest rate ceilings







Transaction costs introduce a wedge between the cost to borrowers and the return to lenders, which reduces the amount lent. Banks or other intermediaries exist, in part, because they are able to reduce the transaction costs of borrowing and lending. This is reflected in the curve Sb. The wedge between the cost to borrowers and the return to lenders is now the bank's spread. Assuming that bank spreads are less than the costs of direct lending, the amount lent increases from Xd to Xb, the return to lenders increases from id to ib, and the cost to borrowers falls from rd to rb. The better banks are at reducing transaction costs, the greater these effects. Reducing taxes on banking (such as unremunerated reserve requirements, which are a part of these costs) has the same effect.

The third diagram shows the effect of an interest rate ceiling (the horizontal line at ic). If the ceiling is applied to deposit rates, it will reduce the amount lent (to Xc) and raise the cost to borrowers (to rc). If the ceiling applies instead to lending rates, banks will set deposit rates at ic, deducting transaction costs. The amount deposited (and lent, when abstracting from reserve requirements) will be Xc. The excess demand for credit (Xo - Xc') cannot be satisfied, and lenders will ration the available supply.

More Recently, Dornbusch R. & Reynoso A. (May, 1989) have summarized the major issues and themes regarding the role of financial factors in economic development. Accordingly, Financial factors play a central role in economic development. But quite different factors have been isolated in Asia and in Latin America. In Asia, the analysis centers on the role of unrepressed financial markets in mobilizing saving and allocating investment. In Latin America, the central question is the role of inflationary finance, the scope for deficits to enhance growth, and, increasingly, the feedback from high and unstable inflation to poor economic performance. The two approaches can be contrasted and it can be concludes that the strong claims for the benefits of financial liberalization are not supported by evidence. But it can be noted that the scope for inflationary finance is small and the risks are larger than commonly accepted.

Growth in per capita income derives from two ingredients: accumulation of physical capital and more efficient use of resources. The efficiency of resource use is supported by the application of superior techniques, but also importantly by policies and institutions. Financial factors in economic development potentially exert and influence through both channels: they

affect the availability of savings but they also affect the intermediation of these savings to the highest return investment opportunities.

Financial factors are important only when financial instability becomes a dominant force in the economy. In this respect, financial factors operate much in the same way as the foreign trade regime: unless it is very distorted indeed, it does not make much difference to the level of per capita GDP. But while there is no significant gain in economic performance between a situation of stable real interest rates of -1 or +2 percent, the financial regime can become a dominant determinant of performance when it deteriorates significantly. Argentina, for example, is sliding back as the economy is becoming increasingly dominated by inflation and deficit finance, and the same is true in Peru.

When hyperinflation takes over and foreign exchange crises disrupt the price system, and shorten the economic horizon to a week or a month, normal economic development is suspended. Moreover, capital flight puts savings outside the home economy. Attention should focus on these extreme cases and explore deeper the thresholds at which financial factors become significant or even dominant, and the particular channels through which this occurs. This argument leads to a discussion of the limits of deficit finance, the risks of and overexposure to external debt service, and the differential flexibility of countries in adjusting rapidly and smoothly to a change in financial resources. Superior growth performance, in this perspective, may be more a reflection of adaptability than financial deepening.

3.9 The Financial Repression Paradigm

Financial repression as an impediment to economic development is a central paradigm. If growth takes investment, then three conditions must be met: firms (and/or the government) must be willing to invest; savings must be available: and these savings must be channeled to those who plan to invest and face the most attractive investment opportunities. The financial structure and institutions can support or disrupt this process. A repressed system, especially in conjunction with high and unstable inflation, is said to interfere in a number of ways with development: saving vehicles are underdeveloped and/or the return on saving is negative and unstable; financial intermediaries who collect saving do not allocate these savings efficiently among competing uses; and firms are discouraged from investing because poor financial policies reduce the returns or make them excessively unstable.

3.10 Theoretical Underpinnings

In response to higher yield on bank deposits, has not-been shown. Incresed positive Real Deposit Rates Raise the Saving Rate. The offsetting income and substitution effect of increased interest rates imply that the net impact on saving must be ambiguous. It is surprising, therefore, to find so strong a belief in the ability of higher interest rates to mobilize saving. Evidence from the United States and other industrialized countries supports skepticism in that virtually no study has demonstrated a discernible net effect. In the case of developing countries, the lack of data and their very poor quality make it much harder to establish the facts.

In some case studies, major stabilization programs do, however, appear to affect the saving rate. There are some ready explanations. First, during financial crisis, saving is channeled into foreign assets via misinvoicing of trade. Accordingly, in these cases national account data easily underestimate true saving. Second, stabilization is associated with fiscal reform that directly raises the national saving rate. Third, durable purchases are recorded as consumption. Following stabilization, a sharp reduction in durable purchases has the appearance of a dramatic increase in saving.

Financial Deepening and Growth are Positively Related. The correlation of growth and financial deepening is feasible.

Higher real deposit interest rates raise savings and hence the equilibrium rate of investment.

An additional channel suggested by Ronald McKinnon (1973) involves complementarity of money and capital: because investment projects are lumpy, investors must accumulate their investment balances in the form of deposits until the required principal is reached. The more attractive the return on deposits, the more willing investors are to engage in the accumulation process. It is difficult to see that this view is very different from one that looks straight-forward at the effect of real interest rates on saving.

Increased Real Deposit Rates Promote Growth. Once again, the immediate channel is that higher real interest rates raise domestic saving and hence increase the available supply of resources for investment. But there are two additional channels that can be considered. The

first deals with external resources. The removal of ceilings allows the domestic financial system to draw in resources that would not otherwise be available.

The second link to growth comes through the quality of investment. It is commonly argued that a repressed financial system allocates saying inefficiently. Rationing leads to financing of below average quality investments.

Investment, Inflation and Growth. The impact of increased real interest rates on the efficiency of investment has been tested by relating the incremental capital output ratio to real deposit rates. Even though these relations frequently have been established, it is not clear what they reflect.

It appears that the empirical support for the growth effects of a liberalized financial system is episodic. There seems to be much stronger support for a different proposition: deficit finance is a hazardous means for promoting growth.

High and unstable inflation rates discriminate against the holding of financial assets when these are not linked to inflation. When nominal interest rates are kept relatively low, the real interest rate fluctuates with the rate of inflation, and is difficult to anticipate if inflation varies a great deal. The effect of inflation upon demand deposits in particular-inasmuch as they do not bear interest-is similar to a tax levied by the state. Overall, therefore, financial repression reduces the demand for financial assets and leads to fewer savings being mobilized, so that the banking system has rates on financial assets provide grounds for either transferring savings abroad, or else raising present consumption to the detriment of savings. In addition, self-financed investment with a relatively low yield is encouraged, so that an efficient division of labour between deficit and surplus units is thereby prevented.

The effectively low real rates of interest on loans increases the aversion to bear risk and the liquidity preference on the part of institutional portfolio managers. This leads to loans on the organized market only being offered to a small group of privileged companies, i.e. absolutely solvent debtors, whose reputation is well-known, whose securities are considered to be relatively free of risk, and who have good connections with the political decision-makers. These privileged groups include public enterprises, private export/import firms and established companies in the processing industry. Other groups-like, for instance, pioneer industries and small firms-are forced to satisfy their credit requirements on the informal money and credit

markets, where the relatively high risk of non-repayment is reflected in the high rates of interest. Rationing of credit, as a consequence of interest rates that are artificially kept low, tends to lead to discrimination against sectors that are not yet established. These comprise above all small companies and farms, as well as pioneer firms, so that one cannot always assume that bank loans flow to the most productive companies, or, indeed, that it is the most efficient producer who asks for loans.

3.11 Financial Deepening and Savings propensity

The financial development of the country is expected to influence the economic growth of the country and in term, is likely to stimulate the countries financial developments in a number of different ways. Financial development involves a change in the financial structure of the country brought about through the growth and a change in the character of the existing financial institution and the emergence of new financial institutions, creation of new types of financial instruments and an increase in the total stock of financial assets relative to the stock of tangible assets and the gross domestic product of the economy. The process is expected, according to the elementary theory of finance, to raise equilibrium saving and investment relative to the economy's income as saving need not be restricted to holding of tangible assets which may involve higher transactions and storage costs and investment need not be restricted to firm's accumulated savings (Intermediation effects). The equilibrium rates of saving and investment as also the ratio of the economy's tangible assets and wealth to its income are expected to increase with financial development as new financial instruments develop with characteristics which better match the preferences of economic agents about maturity, liquidity, risk, etc. and as the control and administration of wealth can be separated from the ownership of it and surplus funds with surplus units in the economy can be made available for some period of time to those who expect to use them more efficiently in the administration of tangible or financial assets than the owners of the surplus funds (the asset transmutation effects).

By now it is clear that an efficient monetary and financial structure may, for more then one reason, lead to higher savings ratio in a developing economy. But, this is just a once and for all kind of an effect, i.e., Increase in the real money balances and variety of other financial assets to cater to the varied preferences of the people will have an effect only till such surplus units in the society achieve their optimal portfolio of money, other financial assets, and

physical assets. Once this position is reached, a further growth in monetary and financial structure will not have any additional effect on the saving ratio.

3.12 Econometric Evidence on savings performance in India

We have used relatively simple methodology to test our hypothesis that financial deepening leads to higher savings ratio. We have regressed the household savings as a proportion of GDP at constant prices on four indicators of financial development, viz, FIR, NIR, IR and FR for the whole period of 1951-52 to 1992-93 as well as for sub-periods of 1951-52 to 1971-72 and 1972-73 to 1992-93. The results are summarized in Table : 3.6. All the indicators are found to be statistically significant in explaining variations in savings ratio. Considering the criteria of overall goodness of it (R^2), finance Ratio (FR) is found to explain the variations to the extent of 70%. It is interesting to note that FR has been found to be statistically significant in all the three periods; other ratios where found to be significant in the whole period and in the first sub-period. During 1972-73-1992-93, FIR, NIR, IR are found to be statistically insignificant. This result also imply that household saving ratio has a statistically significant and stable relationship with finance ratio over the sample period. Further more, the value of (R^2) has not been found to be very high and therefore, it indicates the necessity of including some other relevant variables in the regression equation. Following this, we have experimented with real deposit rate, per capita real income as well as the ratio of issue of financial sector we have also examined the statistical significance of wealth to GDP ratio (Proxied by total stock of tangible and financial assets to GDP). The results are summarized in estimated equations.

It can be seen that all the four indicators together are regressed, they explain 80% variation in rate (r) has not been found to be statistically significant in effecting the saving ratio in the whole period as well as in the sub-periods. This empirical evidence indicates the real rate of interest has no impact on savings in this connection it can be argued that in a country like India where large portion of national income and consumption as slightly above subsistence level, leaving very little scope of adjustments in savings in response to changes in real rate of interest. This may be due to the fact that interest income constitutes only about 8% of total income and more then half of it goes to public sector banking and financial institutions. Besides, about 40% of household savings is made for tax exemptions purposes and thus inelastic to real interest rate variation. In addition to this, interest rate changes induce

the household to reshuffle the assets in their portfolio. For example, between 1980-81 and 1989-90 bank deposits and life insurance fund declined by 5 percentage points and 2 percentage points by more then 2 to 3 percentage points in their relative importance in total household saving.

Table 3.7 (Instrument-wise household financial savings). Besides, cash holding is treated as a luxury in India and thus it is not sensitive to interest rate changes. For the same reason, Bank deposits, the major component of household saving, shows low interest elasticity.

However, bank deposits indicate switch over from short term maturity to long-term maturity when deposits rates are raised. Black income in Indian economy has also increased over the period and the rate or return in black market is high. Thus, a part of saving is diverted in commodities, land, real estate and other real goods. When household savings regressed against real rate, FIR and per capita income, both Real rate and FIR found to statistically insignificant and FIR has a negative coefficient. However, per capita income is found to be highly significant in fact this regression explains 73% variation of household savings.

Alongwith examining the impact of financial intermediation on savings, we have also attempted to empirically assess the complementarity hypothesis. As mentioned earlier Mckinnon work emphasizes the fragmented economic condition that generally pertained to countries which are at the bottom of the development ladder. These include generally small size of firms, the general lack of finance, external to the firm and lumpiness of investment. Here, money plays an important role in improving the quality and increasing quantity of physical investment. Since a substantial personal equity is required whenever investment is undertaking. Therefore, average cash holding are positively related to the propensity to invest (save) under the formal constraint that all investments are self financed. We test for complementarity in the demand for money function for India over the period 1951-52 to 1992-93.

Table 3.7

Instrument–Wise Financial Saving of Household Sector								Percentage Share of Each Instrument in Household Financial Saving					
Period	Currency	Net Deposit	Shares and Debentures	Net Claims on Govt.	Life Insurance Funds	Provident and Pension Funds	Total Financial Saving	Currency Sector	Net Deposit	Shares and Debentures	Net Claims on Govt.	Life Insurance Funds	Provident and Pension Funds
1951–52	–116	–45	49	93	13	20	14	–828.57	–321.43	350.00	664.29	92.86	142.86
1952–53	–17	43	23	–22	18	27	72	–23.61	59.72	31.94	–30.56	25.00	37.50
1953–54	26	21	27	–2	25	45	142	18.31	14.79	19.01	–1.41	17.61	31.69
1954–55	67	38	11	91	22	47	276	24.28	13.77	3.99	32.97	7.97	17.03
1955–56	203	24	41	76	31	54	429	47.32	5.59	9.56	17.72	7.23	12.59
1956–57	48	–19	71	141	30	62	333	14.41	–5.71	21.32	42.34	9.01	18.62
1957–58	50	76	36	19	29	81	291	17.18	26.12	12.37	6.53	9.97	27.84
1958–59	111	42	34	71	32	72	362	30.66	11.60	9.39	19.61	8.84	19.89
1959–60	133	68	61	39	46	86	433	30.72	15.70	14.09	9.01	10.62	19.86
1960–61	145	11	67	57	50	126	456	31.80	2.41	14.69	12.50	10.96	27.63
1961–62	94	103	112	–12	65	127	489	19.22	21.06	22.90	–2.45	13.29	25.97
1962–63	175	70	45	–20	82	147	499	35.07	14.03	9.02	–4.01	16.43	29.46
1963–64	211	118	119	42	78	175	743	28.40	15.88	16.02	5.65	10.50	23.55
1964–65	135	253	64	–32	88	206	714	18.91	35.43	8.96	–4.48	12.32	28.85
1965–66	285	309	175	–9	96	216	1072	26.59	28.82	16.32	–0.84	8.96	20.15
1966–67	188	337	114	–48	104	239	934	20.13	36.08	12.21	–5.14	11.13	25.59
1967–68	145	268	78	–59	122	311	865	16.76	30.98	9.02	–6.82	14.10	35.95
1968–69	263	72	84	–84	139	321	795	33.08	9.06	10.57	–10.57	17.48	40.38
1969–70	334	85	65	–139	160	414	919	36.34	9.25	7.07	–15.13	17.41	45.05
1970–71	345	265	94	–12	189	490	1371	25.16	19.33	6.86	–0.88	13.79	35.74
1971–72	381	574	61	–243	216	566	1555	24.50	36.91	3.92	–15.63	13.89	36.40
1972–73	616	773	26	–196	262	647	2128	28.95	36.33	1.22	–9.21	12.31	30.40
1973–74	812	1260	44	434	326	736	3612	22.48	34.88	1.22	12.02	9.03	20.38
1974–75	17	1017	137	–95	322	976	2374	0.72	42.84	5.77	–4.00	13.56	41.11
1975–76	321	1131	115	742	385	1224	3918	8.19	28.87	2.94	18.94	9.83	31.24
1976–77	1130	1902	87	95	480	1158	4852	23.29	39.20	1.79	1.96	9.89	23.87
1977–78	705	2780	325	180	559	1304	5853	12.05	47.50	5.55	3.08	9 55	22.28
1978–79	1482	2742	175	31	648	1580	6658	22.26	41.18	2.63	0.47	9.73	23.73
1979–80	1338	1650	214	465	739	1675	6081	22.00	27.13	3.52	7.65	12.15	27.54
1980–81	1625	2985	443	576	859	2122	8610	18.87	34.67	5.15	6.69	9.98	24.65
1981–82	955	3001	513	1656	982	2486	9593	9.96	31.28	5.35	17.26	10.24	25.91
1982–83	2026	4622	768	1135	1149	2863	12563	16.13	36.79	6.11	9.03	9.15	22.79
1983–84	2775	3875	777	1777	1296	3054	13554	20.47	28.59	5.73	13.11	9.56	22.53
1984–85	2938	5404	1329	2919	1465	3687	17742	16 56	30.46	7.49	16.45	8.26	20.78
1985–86	2220	5295	1980	3223	1676	4144	18538	11.98	28.56	10.68	17.39	9.04	22.35
1986–87	3090	7805	2711	2670	1981	5055	23312	13.25	33.48	11.63	11.45	8.50	21.68
1987–88	4815	7684	2009	3350	2418	6509	26785	17.98	28.69	7.50	12.51	9.03	24.30
1988–89	4256	4835	2172	5032	3267	7552	27114	15.70	17.83	8.01	18.56	12.05	27.85
1989–90	7655	9572	4970	6017	4089	9506	41809	18.31	22.89	11.89	14.39	9.78	22.74
1990–91	6251	8248	7417	6716	5279	11157	45068	13.87	18.30	16.46	14.90	11.71	24.76
1991–92	7298	16566	12252	3498	6691	12258	58563	12.46	28.29	20 92	5 97	11.43	20.93

Source : National Accounts Statistics (CSO Govt. of India) Various Issues
Report on Currency and Finance (RBI) Various Issues

The demand for money function estimated is

$(M/P)_t = m((S/Y)_t, Y_t, P_t, (M/P)_{t-1})$

and the savings function is

$(S/Y)_t = S((M/P)_t, I_t, Y_t)$

From the estimated equations, for the whole period or for the sub-period, the results don't wholly support complementarity hypothesis. Though, the sign of coefficient of household savings is in conformity with theory, it is not statistically significant for the demand for money function. However, the per capita real balances are found to be statistically significant in the savings function. In the sub-period also similar results are observed. In the period 1972-73 to 1992-93 both the variables (HS/GDP and per capita real balances) are found to be statistically insignificant in their respective regression equation. Alternatively this hypothesis can also be tested by regressing investment on real deposit rate. This is because in the initial stage of development the investment is limited to the low level of savings due to the absence of financial intermediation. Therefore, since savings are positive function of real deposit rate, investment will also have to be positive function of real rate. However from equation, for the whole period as well as the sub period the coefficient on the real interest rate are not only formed to be statistically insignificant. But contrary to the expectation they have negative sign. Thus, the evidence furnished is not consistent with complementarity hypothesis. This result has the implication that financial liberalization in the form of higher real interest rate for stimulating real private investment may not work in the desire direction. The contrary evidence found against complementarity hypothesis may be due to the fact that the positive effect on the domestic credit market suggested by McKinnon and Shaw may be offset by negative effect of a portfolio shift from capital goods and public bonds into monetary assets. It is also possible that a policy of financial liberalization could increase the public sectors demand for domestic credit, thus limiting the funds available to the private sector. It seems the increase in real interest rates, which is a typical elements of financial reforms, does not necessarily involve a positive effect on private investment unless the authorities are careful to ensure that :

1) Bank deposits are closer assets (cash gold) and foreign assets rather then to capital goods;
2) The financial sector assures an efficient allocation of domestic credits;
3) The flow of domestic credit to the private sector is not absorbed by the need of the public sector.

3.13 Financial Repression

The root cause of main reason why Governments stay in the way of private financial evolution is that the financial sector is the potential source of 'easy' resources for the public budget. In fact, the Government has the option and the capability of not allowing the financial sector to operate at its full potential by resorting to all kinds of restrictions. The deliberate policies of financial repression imply various other forms of implicit subsidization of the public sector. From this we can hypothesize that repressive policies heart economic growth given that financial intermediation is an important component of the aggregate production function and if marginal product of capital of an economy more financially developed is larger than the marginal product of less financially developed economy. We have explored the empirically relation between economic growth and real interest rate for the Indian economy for the period 1951-52 to 1992-93 and also for the sub-period. It is found that the real deposit rate has a negative impact on economic growth during the whole period. For the period 1951 to 1971-72 real deposit rate has positive effect on GDP but this may be due to the fact that Indian economy in the first initial decades, has experienced low rates on inflation rendering real rate positive. However, in the second period the real rate has a negative effect on growth rates.

The saving equation 31 shows that the saving rate is influenced statistically significantly (at, say, 5 percent level) and negatively by the ratio of the total stock of tangible and financial assets to GDP and positively by the ratio of total issues to GDP. If total assets to GDP ratio is considered as a proxy for the ratio of (unconsolidated) Wealth to GDP and if the ratio of total issues to GDP is considered as a measure of the financial activity in the year, the equation suggests that the behaviour of the aggregate real gross saving rate in the Indian economy over the decades of seventies and the eighties may be explained by two opposite influences. The increasing level of financial activity over the years has tended to increase the gross saving rate, possibly on account of the intermediation and asset transmutation effects, mentioned earlier, created by it. On the other hand, the increasing level of total assets relative to GDP, resulting from financial and capital deepening over the years, had exercised a negative influence on the gross saving rate, indicating an adjustment in the saving rate motivated by an attempt to build up to some desired ratio of total assets or wealth to GDP (as

postulated by Harry Johnson, 1970[100]) or because consumption is related to income as well as wealth, as postulated by Ando and Modiglianni (1965), so that saving, at a given level of income, tends to decline as wealth increases, to maintain the normal consumption-wealth relation. Given this saving behaviour, continuous expansion in financial activity and continuous financial innovational activity will be needed to counter the tendency to aim for a given wealth-income ratio or of the negative effect of a given consumption wealth relationship on the saving rate. Also, a faster growth of GDP, as compared with that of total assets or wealth, would be necessary in order to raise the saving rate. A growing total assets GDP ratio is an indication of a low rate of return on total assets or wealth and this dampens the motivation for increasing the saving rate and wealth. The saving equation in shows that as far as the real deposit rate variable is concerned, it shows a negative but statistically insignificant coefficient, contrary to the expectation of the McKinnon-Shaw hypothesis.

Equation 32 examines the influence of financial and capital deepening and the real lending rate on the incremental productivity of capital. The equation shows that capital deepening has a strong positive influence over the incremental productivity of capital. Financial deepening, surprisingly, shows a strong negative impact on incremental productivity of capital which is statistically significant and the real lending rate shows negative but statistically insignificant influence on it. Thus, the equation does not provide support for the McKinnon-Shaw hypothesis. Financial deepening and an increase in the real deposit and lending rates do not seem to have resulted in increasing the aggregate incremental productivity of capital in India over the decades of the seventies and the eighties. It is possible that the statistical result of equation 32 may have been affected by multicollinearity since the correlation between our measures on financial deepening (FS/GDP) and capital deepening (K/GDP) is as high as 0.9 which may make it impossible to isolate the effect of financial deepening from that of capital deepening. However, multicollinearity mainly has the effect on overestimating the standard errors of the estimated coefficients, and the negative coefficient obtained for financial deepening happens to be statistically significant (at the 5 percent level). Therefore, we may not be justified in blaming the negative sign of this coefficient on multicollinearity. One may perhaps interpret the negative influence of financial deepening on the incremental productivity of capital as itself reflecting the kind of financial development

[100] Johnson H.G. (1970), "Money in a Growth Model", in A.K. Sen (ed.) Growth Economics selected readings, Baltimore, M. Penguin, pp.259-271.

which we had with diversion of financial resources, through statutory liquidity ratio for banks and other financial institutions and the earmarking of the flow of credit to the priority sectors, to sectors which had low incremental output capital ratios.

Table 3.6 : Household Savings and Financial Development

Period : 1951-52 to 1992-93

(I) Hs = f (FIR); (ii) Hs = f (NIR); Hs = f (IR); Hs = f (FR); Hs = A+b FIR

	1	2	3	4
	FIR	**NIR**	**IR**	**FR**
A	7.78	7.26	9.1	8.7
b	4.1	7.3	8.5	0.24
(t-value)	(5.72)	(5.72)	(4.32)	(9.75)
R^2	0.45	0.45	0.31	0.70
R^{-2}	0.43	0.43	0.30	0.69

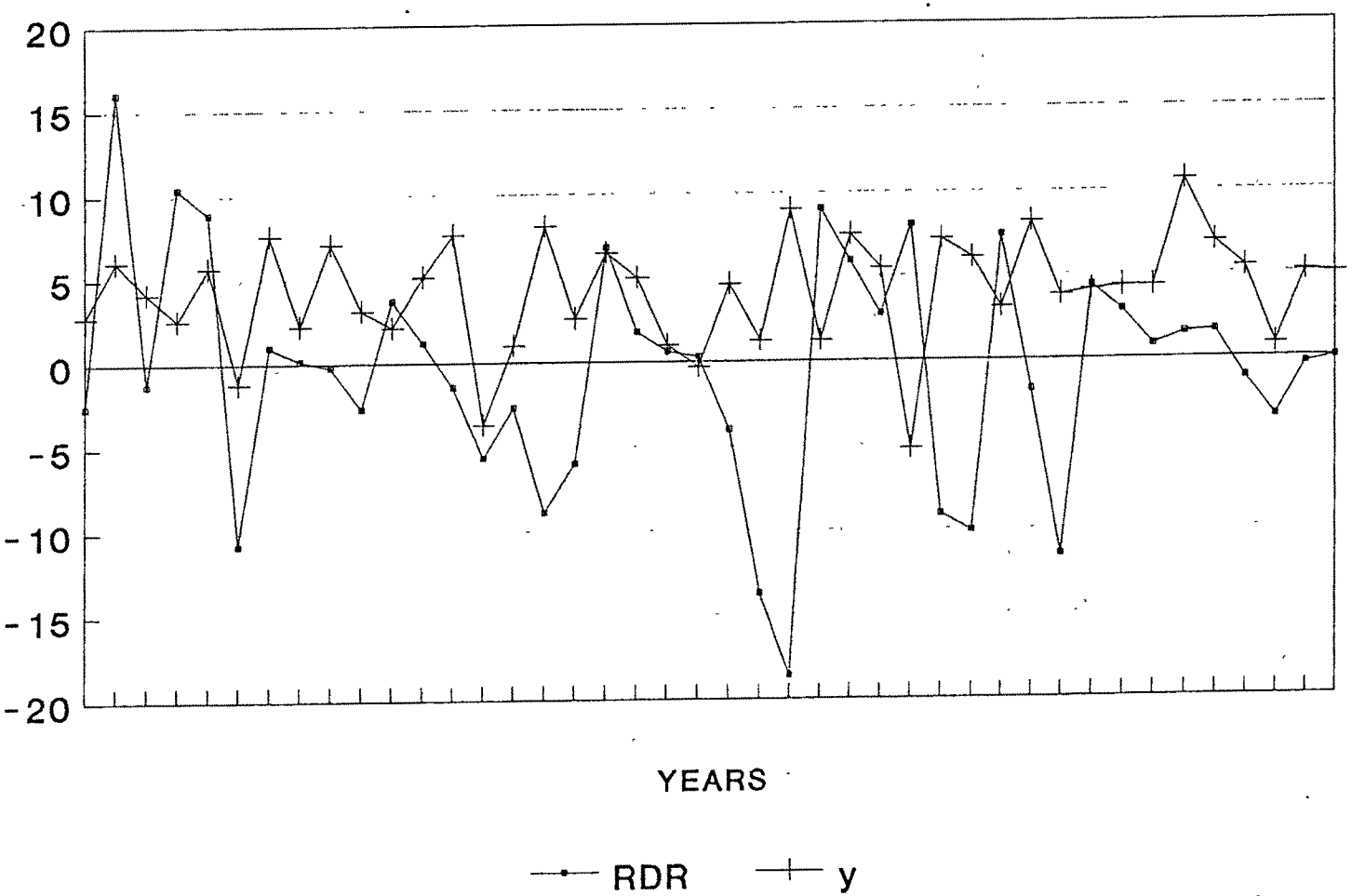
Period : 1951-52 to 1971-72

	FIR	**NIR**	**IR**	**FR**
A	8.3	7.6	9.3	7.01
b	2.4	4.8	3.7	0.37
(t-value)	(2.05)	(2.13)	(2.42)	(4.68)
R^2	0.18	0.20	0.24	0.54
R^{-2}	0.14	0.15	0.20	0.52

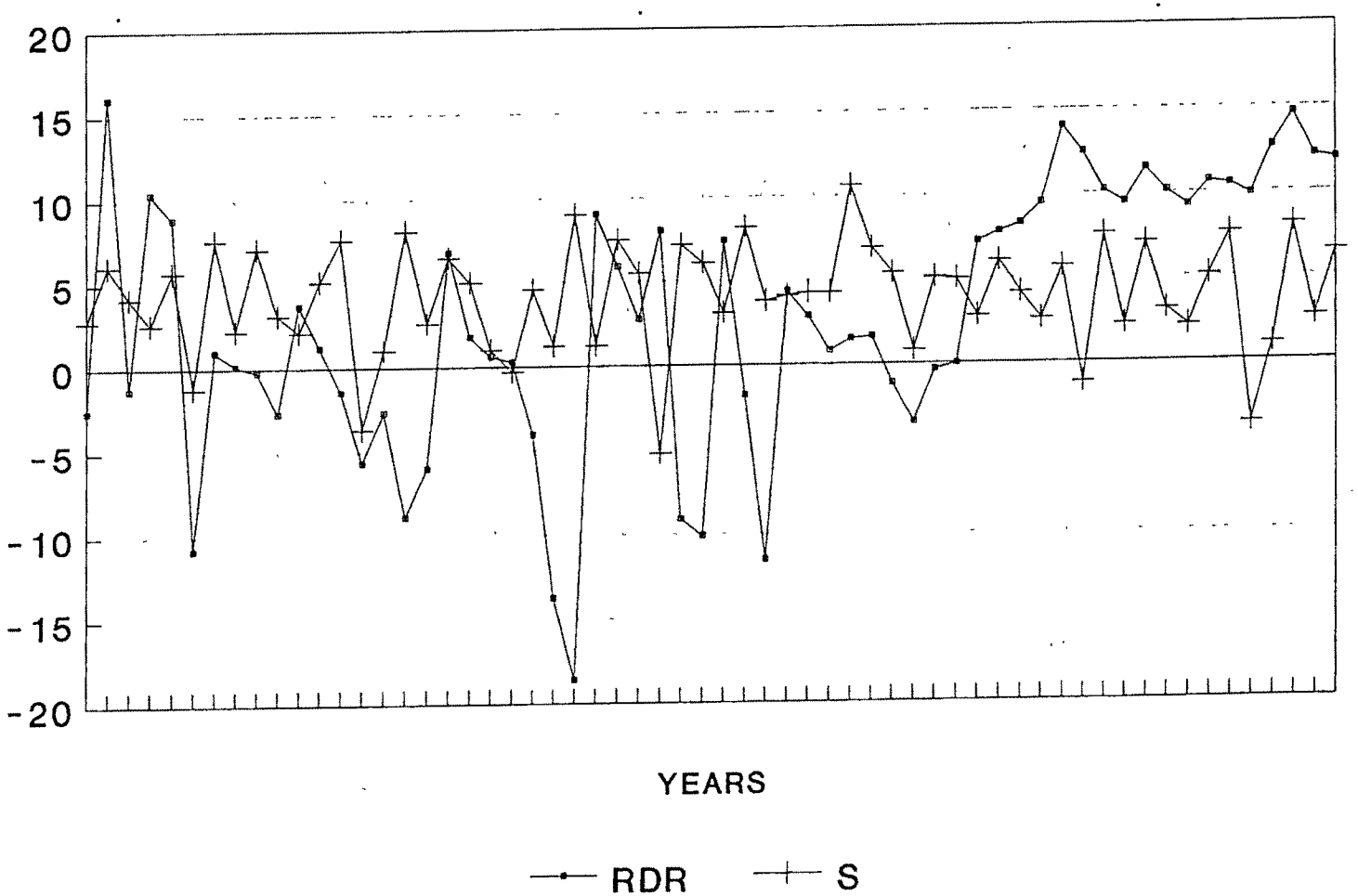
Period : 1972-73 to 1992-93

	FIR	**NIR**	**IR**	**FR**
A	15.16	14.2	18.0	7.32
b	0.94	2.44	-1.16	0.15
(t-value)	(0.78)	(1.32)	(-0.23)	(3.0)
R^2	0.03	0.08	0.002	0.31
R^{-2}	0.01	0.03	-0.04	0.27

REAL GROWTH RATE AND REAL DEPOSIT RATE
1951-52 TO 1992-93



REAL DEPOSIT RATE AND HOUSEHOLD SAVINGS
1951-52 TO 1992-93



Period : 1951-52 to 1992-93

(1) Hs/GDP = f (FR, IR, NIR, FIR)

Hs = 9.28 + 0.38 FR + 5.07 IR + 1.21 NIR - 4.85 FIR

(8.56) (7.25) (3.39) (0.35) (-2.47)

R^2 = 0.81

R^2 = 0.79

(2) Hs/GDP = f (Real Deposit Rate, Per Capita Real Income)

Hs = -3.394 + 0.009 Real Rate + 0.11 Per Capita Real Income

(-1.97) (0.20) (-10.42)

R^2 = 0.73

R^2 = 0.72

(3) Hs/GDP = f (Real Deposit Rate, FIR, Per Capita Income)

Hs = -3.50 + 0.010 Real Rate - 0.10 FIR + 0.11 Per Capita Income

(-1.790) (0.21) (-0.12) (6.40)

R^2 = 0.73

R^2 = 0.71

(4) Hs/GDP = f (Issue of Financial Sector/GDP, Real Deposit Rate)

Hs = 11.80 + 24.81 Financial Issue/GDP - 0.01 Real Deposit Rate

(23.0) (7.47) (-0.16)

R^2 = 0.58

R^2 = 0.56

(5) M/P/Pop = M_1 = f (m_{t-1}, Rate of Inflation. Hs/GDP, Per Capita Income)

M/P/Pop = M_1

= 0.13 + 0.24 (Mp_{t-1}) - 0.01 (P*) + 0.02 (Hs/GDP) + 0.001 (Per Capita GDP)

(0.56) (2.66) (-0.90) (0.79) (4.48)

R^2 = 0.86

R^2 = 0.85

(6) Hs/GDP = f Rate of Growth of + [Per Capita NNP]+ [Per Capita Real Balances]
Per Capita NNP

= -3.70 -0.16 Rate of Growth of + 0.19 [Per Capita NNP]+ 0.01 [Per Capita Real Balances]
Per Capita NNP

(-2.21) (-1.62) (0.16) (3.85)

R^2 = 0.75

R^2 = 0.73

Period : 1951-52 to 1971-72

(7) Hs/GDP = f (FR, IR, FIR, NIR)

Hs = 9.07 + 0.68 FR + 1.71 IR - 1.96 FIR - 5.76 NIR

(8.10) (4.82) (1.14) (-0.78) (-1.19)

R^2 = 0.72

R^2 = 0.65

(8) Hs/GDP = f (Real Deposit Rate, Per Capita Real Income)

Hs = -4.18 + 0.29 Real Rate + 0.01 Per Capita Real Income

(-0.76) (-0.43) (2.80)

R^2 = 0.36

R^2 = 0.29

(9) Hs/GDP = f (Real Deposit Rate, FIR, Per Capita Income)

Hs = -2.61 - 0.037 Real Rate + 0.75 FIR + 0.01 Per Capita Income

(-0.411) (-0.523) (0.51) (1.77)

R^2 = 0.37

R^2 = 0.25

(10) Hs/GDP = f (Issue of Financial Sector/GDP, Real Deposit Rate)

Hs = 8.30 + 272.7 Financial Issue/GDP - 0.02 Real Deposit Rate

(13.52) (5.12) (-0.38)

R^2 = 0.63

R^2 = 0.59

(11) M/P/Pop = M_1 = f (m_{t-1}, Per Capita Income, Hs/GDP, Rate of Inflation)

M/P/Pop = M_1

= 3.33 + 0.16 (Mp_{t-1}) - 0.00093 (Per Capita NNP) + 0.027 (Hs/GDP) + 0.020 (P*)

(5.32) (2.441) (-1.755) (1.119) (1.437)

R^2 = 0.53

R^2 = 0.40

(12) Hs/GDP = f Rate of Growth of Per Capita NNP + [Per Capita NNP]+ [Per Capita Real Balances]

= 14.37 -0.15 Rate of Growth of Per Capita NNP +3.33 [Per Capita NNP]+0.011[Per Capita Real Balances]

(-2.33)(-1.30) (1.96) (3.33)

R^2 = 0.54

R^2 = 0.45

Period : 1972-73 to 1992-93

(13) Hs/GDP = f (FR, IR, FIR, NIR)

Hs = 10.60 + 0.31 FR + 5.92 IR - 6.67 FIR - 4.74 NIR

(2.49) (3.76) (1.24) (-2.24) (0.86)

R^2 = 0.57

R^2 = 0.47

(14) Hs/GDP = f (Real Deposit Rate, Per Capita Real Income)

Hs = 4.40 + 0.086 Real Rate + 0.01 Per Capita Real Income

(1.41) (1.40) (4.14)

R^2 = 0.54

R^2 = 0.49

(15) Hs/GDP = f (Real Deposit Rate, FIR, Per Capita Income)

Hs = -3.2 - 0.033 Real Deposit Rate + 0.56 FIR + 0.02 Per Capita NNP

(-2.14) (-0.325) (0.62) (1.23)

R^2 = 0.53

R^2 = 0.49

(16) Hs/GDP = f (Issue of Financial Sector/GDP, Real Deposit Rate)

Hs = 14.94 + 13.10 Financial Issue/GDP + 0.10 Real Deposit Rate

(18.44) (3.48) (1.63)

R^2 = 0.47

R^2 = 0.41

(17) M/P/Pop = M_1 = f (m_{t-1}, Per Capita Income, Hs/GDP, Rate of Inflation)

M/P/Pop = M_1

= -0.51 + 0.42 (Mp_{t-1}) + 0.005 (P*) + 0.02 (Hs/GDP) + 0.0013 (Per Capita NNP)

(-1.0) (1.98) (0.26) (0.627) (2.21)

R^2 = 0.87

R^2 = 0.83

(18) Hs/GDP = f Rate of Growth of Per Capita NNP + [Per Capita NNP]+ [Per Capita Real Balances]

= 2.37 -0.11 Rate of Growth of Per Capita NNP + 0.01 [Per Capita NNP]+ 0.011[Per Capita Real Balances]

(0.77) (-0.68) (0.004) (1.428)

R^2 = 0.51

R^2 = 0.43

1951-52 to 1991-92

(19) Saving/GDP = f (Real Deposit Rate)

= 14.15 - 0.013 Real Deposit Rate

(22.79) (-0.15)

R^2 = 0.0053

R^2 = 0.02445

(20) Investment/GDP = f (Real Lending Rate)

= 19.46 - 0.038 Real Lending Rate

(24.64) (-0.39)

R^2 = 0.00389

R^2 = -0.02102

(21) Growth Rate/GDP = f (Real Deposit Rate)

= 4.13 - 0.019 Real Deposit Rate

(8.028) (-0.264)

R^2 = 0.011

R^2 = 0.011

1951-52 to 1971-72

(22) Saving/GDP = f (Real Deposit Rate)

= 11.020 - 0.09 Real Deposit Rate

(22.83) (-1.193)

R^2 = 0.073

R^2 = 0.021

(23) Investment/GDP = f (Real Lending Rate)

= 17.35 - 0.21 Real Lending Rate

(24.39) (-2.35)

R^2 = 0.23

R^2 = -0.19

(24) Growth Rate/GDP = f (Real Deposit Rate)

= 3.70 + 0.16 Real Deposit Rate

(5.49) (1.52)

R^2 = 0.11

R^2 = 0.06

1972-73 to 1992-93

(28) Saving/GDP = f (Real Deposit Rate)

= 17.24 - 0.14 Real Deposit Rate

(29.43) (1.74)

R^2 = 0.13

R^2 = 0.088

(29) Investment/GDP = f (Real Lending Rate)

= 21.46 - 0.10 Real Lending Rate

(24.33) (0.94)

R^2 = 0.04

R^2 = -0.005

(30) Growth Rate/GDP = f (Real Deposit Rate)

= 4.28 - 0.13 Real Deposit Rate

(5.80) (-1.36)

R^2 = 0.084

R^2 = 0.038

1951-52 to 1991-92

(31) Saving/GDP = f (Real Deposit Rate , Total Issue/GDP_t , Wealth/GDP_{t-1})

= 0.37 - 0.00039 Real Deposit Rate + 0.85 (TI/GDP_t) - 0.078 (W/GDP_{t-1})

(11.28) (-0.97) (4.89) (-5.66)

R^2 = 0.81 R^2 = 0.75 D.W.S = 1.93

(32) $(dY/dK)_t$ = f (FS/GDP_{t-2}, K/GDP_{t-2} , Real Deposit Rate)

= 0.41 - 0.33(FS/GDP_{t-2}) + 0.47 (K/GDP_{t-2}) - 0.0029 Real Deposit Rate

(-2.5) (-3.32) (4.80) (-1.79)

R^2 = 0.73 R^2 = 0.66 D.W.S. = 2.08

APPENDIX III DATA ON VARIABLES INCLUDED IN THE REPORTED REGRESSIONS

	Financial Inter relation Ratio(FIR)	New Issue Ratio(NIR)	Inter– mediation Ratio(IR)	Finance Ratio (FR)	Household Savings/ GDP at constant Prices (1980–81)	Per Capital NNP at 1980–81 Prices Rs. In Crores	Per Capita MP	Expected Rate of Inflation	Leg Per Capita MP	Rate of growth per capita NNP	Wealth Rs. In Crores	GROWTH RATE OF SAVING TO GDP (S/Y)x100	GROWTH RATE OF REAL GDP 1980–81	REAL RATE OF INTEREST	REAL LENDING RATE	S33 GDCF/GDP (I/Y)x100
1951–52	0 10	0.17	−0.38	0.01	0.014	1135.00	2.50	11.30			35319	9.07	2.3			11.04
1952–53	0.25	0.31	−0.21	0.01	0.013	1146.00	2.70	−4.80	2.50	1.00	38915	7.23	2.8	−2.57	2.43	11.22
1953–54	0.83	0.56	0.47	0.04	0.014	1195.00	2.60	−1.90	2.70	4.30	43270	7.78	6.1	16.01	21.01	11.46
1954–55	1.12	0.64	0.76	0.07	0.015	1221.00	3.02	0.36	2.60	2.20	48232	8.25	4.2	−1.29	3.71	10.39
1955–56	1 21	0.74	0.65	0.12	0.022	1229.00	3.50	4.00	3.02	0.70	55973	9.46	2.6	10.41	15.41	12.25
1956–57	0.67	0.39	0.69	0.08	0.022	1271.00	3.20	7.20	3.50	3.40	66280	13.94	5.7	8.89	13.89	15.86
1957–58	0.99	0.61	0.65	0.11	0.018	1224.00	3.17	4.80	3.20	−3.70	75856	12.45	−1.2	−10.79	−5.79	16.59
1958–59	1.32	0.80	0 62	0.11	0.018	1289.00	3.12	5.20	3.17	5.30	83264	10.14	7.6	0.97	5.57	17.02
1959–60	1.47	0.95	0.54	0.13	0.022	1286.00	2.94	4.00	3.12	−0.20	91522	9.43	2.2	0.14	4.74	15.39
1960–61	0.92	0.74	0.23	0.10	0.021	1350.00	2.92	3.30	2.94	5.00	102003	11.42	7.1	−0.25	4.35	15.84
1961–62	1.26	0.83	0.51	0.12	0.019	1355.00	3 00	3.50	2.92	0.40	111230	10.10	3.1	−2.72	1.88	15.99
1962–63	1 66	0.81	0.43	0.13	0 023	1347 00	3.00	7.00	3.00	−0.60	122403	9.22	2.1	3.71	8.31	17.31
1963–64	1 29	0.88	0.47	0.14	0.024	1384.00	3.00	8.30	3.00	2.70	134315	10.65	5.1	1.18	4.68	18.05
1964–65	1 23	0.74	0.53	0.12	0.025	1455.00	3 01	10.70	3 00	5.10	147460	10.48	7.6	−1.46	2 04	19.07
1965–66	1.27	0.87	0.47	0.16	0.035	1355.00	2.97	11.03	3.01	−6.90	162535	9.85	−3.7	−5.66	−2.16	18.61
1966–67	0.94	0.72	0.45	0.15	0.047	1355.00	2.84	8.10	2.97	−1.50	178797	12.68	1.0	−2.69	0.81	20.26
1967–68	1.20	0.84	0.16	0.13	0.043	1413.00	2.72	13.50	2.84	5.80	193195	14.62	8.1	−8.90	−5.40	19.61
1968–69	1.34	0.84	0.60	0.12	0.042	1415.00	2.90	2.60	2.72	0.10	206528	12.11	2.6	−6.01	−3.11	17.95
1969–70	1.10	0.64	0.60	0.12	0.051	1478.00	2.89	4.90	2.90	4.50	223181	11.88	6.5	6.80	9.70	18.72
1970–71	1.31	0.82	0.59	0.15	0.053	1520.00	3.10	7.03	2.89	2.80	241584	14.09	5.0	1.77	4.67	18.57
1971–72	1.24	0.72	0.72	0.15	0.059	1492.00	3 64	11.90	3.10	−1.80	261385	13.87	1.0	0.63	3.13	17.94
1972–73	1.47	0.83	0.78	0.16	0.062	1446.00	3.77	17.90	3.65	−3.10	279835	14.60	−0.3	0.29	3.69	18.88
1973–74	1.11	0.52	1.11	0.15	0.089	1483.00	3.54	14.20	3.70	2.60	306546	13.88	4.6	−4.03	−0.18	19.76
1974–75	1.32	0.89	0.47	0.17	0.089	1469.00	2.96	8.20	3.50	−0.90	331836	16.55	1.2	−13.74	−9.10	17.53
1975–76	1.85	1.06	0.74	0.24	0.1	1572.00	3.20	2.30	2.90	7.00	359551	13.15	9.0	−18.61	−10.93	16.80
1976–77	1.74	0.98	0.79	0.25	0.12	1552.00	3.66	2.40	3.20	−1.30	392013	14.91	1.2	9.03	14.92	18.87
1977–78	2.21	1.20	0.83	0.32	0.13	1635.00	3.13	7.16	3.60	5.30	428321	17.39	7.5	5.92	11.70	20.96
1978–79	1 24	0.72	0.70	0.23	0.14	1689.00	3.70	11.45	3.13	3.30	473391	17.79	5.5	2.77	6.96	20.85
1979–80	2.03	1.22	0.65	0.33	0.15	1550.00	3.50	11.50	3.70	−8.20	514998	20.37	−5.2	8.00	12.75	12.49
1980–81	1.85	1.05	0.76	0.32	0.18	1630.00	3.40	9.20	3.50	5.20	562564	17.97	7.2	−9.11	−3.46	22.03
1981–82	1.86	1.17	0.59	0.31	0.17	1688.00	3.60	9.76	3.40	3.60	617450	10.49	6.1	−10.12	−3.22	21.46
1982–83	3.00	1.73	0.74	0.42	0 17	1688.00	3.70	11.10	3.60	0.00	671589	16.80	3.1	7.40	14.70	24.19
1983–84	2.18	1.27	0.71	0.29	0.2	1787.00	3.48	10.10	3.70	5.90	728874	15.73	8.2	−1.79	5.48	24.42
1984–85	2.94	1.70	0.72	0.37	0.21	1811.00	3.92	6.13	3.48	1.30	789555	15.42	3.8	−11.57	−5.48	21.02
1985–86	2.45	1.41	0.72	0.35	0.24	1842.00	4.28	7.30	3.92	1.70	865059	15.41	4.1	4.36	10.38	22.14
1986–87	2.15	1.10	0.91	0.32	0.25	1871.00	4.23	7.68	4.28	1.60	943628	16.79	4.3	2.86	8.40	23.87
1987–88	2.00	1.11	0.79	0.35	0.33	1901.00	4.32	8.30	4.23	1.60	1029044	16.21	4.3	0 80	6.22	24.19
1988–89	2.23	1.28	0.74	0.43	0.36	2085.00	4.53	10.30	4.32	9.70	1140521	19.68	10.6	1.51	6.80	25.10
1989–90	2.12	1.25	0.70	0.46	0.41	2134.00	4.96	11.33	4.53	2.30	1274014	19.97	6.9	1.63	6.73	25.07
1990–91	1.94	1.56	0.67	0.41	0 5	2223.00	4.86	10.00	4.96	3.05	1429464	20.49	5.4	−1.17	4.48	25.54
1991–92	2.28	1.35	0.70	0.45	0.47	2178.00	5.30	8.30	4.86	−2.02	1594855	22.09	0.8	−3.49	2.51	25.77
1992–93	2.69	1.73	0.55	0.50	0.49	2226.00	5.45	6.30	5.30	2.20	1795922	20.41	5.1	−0.37	6.13	25.50

Period	GDP at Constant Prices 1980–81	Labour Force	Net Capital Stock at Constant Prices 1980–81	Total Credit	M1/P	M3/P	NDP of Agri.	Capital Stock of Agri. (1980–81)	Credit to Agri. Sector	Labour Force Agri. Sector	Labour Force Indus. Sector	NDP of Indus.	Capital Stock to Indus. Sector	Credit to Indus. Sector
1951–52	43872.00	163177.00	34314.00	585.00	92.50	109.10	4734.00	29473.00	21.10	125530.00	37647.00	1099.00	4720.00	178.80
1952–53	45117.00	165210.00	371104.00	518.00	102.90	123.80	4644.00	30420.00	21.00	126970.00	38240.00	1025.00	5343.00	204 10
1953–54	47863.00	167470 00	40537.00	533.00	101.80	123.50	5154.00	31013.00	20.50	128590.00	38880.00	1154.00	6001.00	231.50
1954–55	49895.00	169955.00	44445.00	612.00	116.90	142.30	4278.00	31738 00	22.60	130393.00	39562.00	1193.00	6617.00	289.70
1955–56	51173.00	172666.00	50756 00	761.00	139.90	168.70	4123.00	32549.00	23.70	132310.00	40356.00	1219.00	7480.00	303.80
1956–57	54086.00	175523.00	59464.00	900.00	129.60	158.70	5309.00	33314.00	24.20	134380.00	41143.00	1454.00	8874.00	389.70
1957–58	53432.00	178573.00	67670.00	962.00	129.70	170.00	5178.00	34038.00	21.60	136580.00	41993.00	1539.00	10594.00	398.10
1958–59	57487.00	181801.00	73669.00	1013.00	130.80	180.10	6035.00	34685.00	25.70	141340.00	40461.00	1614.00	11616.00	418.50
1959–60	58745.00	185158.00	80162.00	1127.00	125.66	193.20	6018.00	35160.00	16.60	141340.00	43818.00	1807.00	12789.00	562.80
1960–61	62904.00	188649.00	88580.00	1320.00	126.90	184.90	6314.00	35886.00	18 40	143840.00	44809.00	2102.00	14319.00	660.00
1961–62	64856.00	191985.00	95714.00	1408.00	133.60	197.60	6484.00	36646.00	15.70	146210.00	45775.00	2311.00	15148.00	793.80
1962–63	66228.00	195427.00	104411.00	1588.00	136.60	204.20	6606.00	37499.00	14.90	148600.00	46827.00	2565.00	16432.00	921.20
1963–64	69581.00	198918.00	113497.00	1816 00	139.40	216.80	7842.00	38474.00	18.69	151040.00	47878.00	2911.00	17725.00	1104.40
1964–65	74858.00	202645.00	123507.00	2034.00	142.80	209.40	9679.00	39526.00	37.50	153510.00	49135.00	3194.00	19202.00	1339.40
1965–66	72122.00	206427.00	134791.00	2288.00	144.20	216.90	9551.00	40611.00	45.90	156030.00	50397.00	3376.00	21133.00	1757.70
1966–67	72586 00	210321.00	146539.00	2694.00	140.60	211.60	11145.00	41668.00	75.30	158590.00	51731.00	3619.00	23133.00	1979.80
1967–68	78785.00	214379.00	156440.00	3033.00	137.60	206.10	14109.00	42963.00	99.90	161190.00	53189.00	3824.00	24845.00	2068.30
1968–69	80841.00	218575 00	165076 00	3396.00	150.60	233.80	14390.00	44170.00	188.41	163830.00	54745.00	4140.00	26087.00	2534.50
1969–70	86109.00	203350.00	175685.00	3971.00	156.90	253.10	15772.00	45556.00	341.70	166520 00	36830.00	4794.00	27438.00	2969.00
1970–71	90426.00	180710.00	187359.00	4684.00	168.20	281.90	16190.00	46796.00	378 50	169250.00	11460.00	5219 00	28693.00	3012.00
1971–72	91339.00	182968.00	199652.00	5263.00	202.40	308.90	16405.00	48090.00	501.50	172030.00	10938.00	5811.00	29619.00	3569.00
1972–73	91048.00	185346.00	210269.00	6115.00	214.30	332.60	17988.00	49455.00	572.00	174850.00	10496.00	6441.00	30912.00	3853.00
1973–74	95192.00	187940.00	225548.00	7399 00	205 50	323.20	23936.00	50705.00	598.80	178010.00	9930.00	7847.00	32043.00	4555.00
1974–75	96297.00	190759.00	238112.00	8762.00	175.10	286.20	25965.00	51693.00	785.00	181210.00	9549.00	10029.00	33560.00	5092.00
1975–76	104968.00	193811.00	250899.00	10877.00	195.20	331.10	25404.00	52841.00	1092.00	184480.00	9331.00	10208.00	36463.00	5239.00
1976–77	106280.00	197105.00	265331.00	13173.00	227.20	397.00	25742.00	54597.00	1381.00	187800.00	9305.00	11396.00	38153.00	5372.00
1977–78	114219.00	200652.00	281409.00	14939.00	199.00	455.10	30750.00	56356.00	2525.00	191180.00	9472.00	12895.00	40125.00	6209.00
1978–79	120504.00	204865.00	302341.00	17795.00	238.70	551.80	31116.00	58493.00	2710.00	193610.00	11255.00	14835.00	43058.00	7173.00
1979–80	114236.00	209249.00	319300.00	21538.00	235.60	552.80	31541.00	60651.00	2967.00	196050.00	13199.00	16840.00	44913.00	8269.00
1980–81	122427.00	223333.00	338093.00	25371.00	231.20	553.50	40056.00	66563.00	3584.00	198520.00	24813.00	18698.00	51248.00	9960 00
1981–82	129889.00	228249.00	359522.00	29681.00	247.10	623.60	44971.00	70909.00	4615.00	201030.00	27219.00	21743.00	56225.00	11155.00
1982–83	133915.00	233381.00	379220.00	35493.00	260.80	666.00	47376.00	71866.00	5269.00	203560.00	29821.00	24100.00	62149.00	13234.00
1983–84	144865.00	238632.00	396067.00	41294.00	251.70	653.60	57806.00	73265.00	6551.00	206130.00	32502.00	28553.00	64057.00	14767.00
1984–85	150469.00	244001.00	413644.00	48953.00	289.90	745.30	61257.00	73969.00	7995.00	206320.00	37681.00	32159.00	66322.00	16448.00
1985–86	156600.00	249564.00	435562.00	56308.00	300.30	815.00	65387.00	74989.00	-9391.00	206500.00	43064.00	35804.00	69372.00	18397.00
1986–87	162711.00	255254.00	456705.00	63308.00	325.80	895.20	69446.00	76281.00	10852.00	206670.00	48584.00	39447.00	72445.00	21643.00
1987–88	170041.00	261380.00	476576.00	70536.00	342.30	963.20	78065.00	77774.00	12029.00	206820.00	54560.00	45508.00	102696.00	25704.00
1988–89	187725.00	267914.00	501314.00	89718.00	367.30	1059.30	97969.00	79108.00	14146.00	206970.00	60944.00	54184.00	111736.00	33625.00
1989–90	201453.00	274569.00	525427.00	105453.00	408.40	1152.90	108387.00	80346.00	16939.00	213540.00	61029.00	66844.00	118927.00	38752.00
1990–91	212253.00	277413.00	563411.00	119302.00	409.70	1172.50	127259.00	81724 00	17195.00	239630.00	37783.00	77093.00	126952.00	45525.00
1991–92	213983.00	281208.00	595713 00	125593.00	456.70	1259.30	152907.00	82966.00	19571.00	259780.00	21428.00	82243.00	131227.00	51524.00
1992–93	224887.00	287642.00	648459.00	151053 00	475.30	1321.40	173913.00	86424.00	21425.00	275760 00	11882.00	92974.00	157312.00	57835.00