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ABSTRACT

The paper explores long-term relations among saving, investment and interest rates during the periods of financial repression and financial liberlalisation in India. We find that savings are found to be non-responsive to interest rate changes, suggesting that the inter-temporal elasticity of substitution of consumption and hence saving is very low. The exploration of causal relation between saving and lending shows that there is no support to the view that saving flows determine or cause lending flows; rather, in the financially deregulated post-reform India, it is found that the causality, in fact, runs from lending to saving flows. Finally, the existence of interest rate rigidity or financial inefficiency even in a deregulated regime suggests that financial market is yet to become sufficiently mature and that the ability of higher interest rates to raise the rate of savings is rather limited. One can interpret our empirical results, in the light of an alternative theoretical framework, the post-Keynesian approach that embeds liquidity preference of intermediaries as well as non-financial firms' behaviour and their interrelationship, financial institutional structure and central bank policy as important determinants of the provision of credit and hence investment.

Key Words: **Interest Rate, Savings and Credit**

banking system and developing the capital market. These measures were aimed at improving the functioning, competitiveness and efficiency of the financial market, impinging on the behaviour of three crucial macro-monetary variables viz. savings, investment and the rate of interest. It would be of interest to examine the inter-relationship among these three variables during the post-liberalisation period and compare the same with a longer-term analysis.

2. ANALYTICAL FOUNDATIONS

The first fundamental issue is: Do savings respond positively to interest rate changes? Why total savings do not usually respond positively to interest rate changes has been provided a theoretical justification in the literature. Given complete information, in the absence of market imperfections, economic theory predicts that optimising agents smoothen their inter-temporal consumption movements in interest rates affect future consumption behaviour (Hall 1978). However, a model in the optimising framework is not well supported by the empirical evidence (Taylor 2000). Rather, empirically it is found that the, periods in which consumption is high relative to income are typically followed by growth in income, suggesting that the "excess sensitivity" of aggregate consumption expenditure to movements in income (Favin 1981) shows that the forward-looking consumers' knowledge of future income is reflected in current consumption (Campbell and Mankiw 1989). Expected changes in income are correlated with expected changes in consumption whereas expected real interest rates are not. This, in turn, implies that in periods of high interest rate regime, since consumption does not show much variation, savings may not respond. In responding to interest rate movements, forward-looking agents (consumers) consume their permanent income but are reluctant to substitute consumption inter-temporally in response to interest rate movements. So, their inter-temporal elasticity of substitution between consumption at different dates must be close to zero and, therefore, savings declining function of the rate of interest. Hence, the interest rate is the variable that restores equilibrium between saving and investment. The policy conclusion, then, is that since investment adjusts to savings, measures that encourage domestic saving will yield the appropriate level of investment. However, both Keynes and Kalecki, rejecting the classical view, tried to establish the independence of investment from saving (Pollin 1994).

More recently, the new Keynesians, recognising the importance of imperfect information and the post-Keynesians, applying Keynes' postulate of fundamental uncertainty in the markets underscore both the quality and quantity of credit as important determinants of the pace of investment (Dymski, 1994). The heterodox monetary approach - the "credit theory of money", emphasising the underlying institutional linkages between financial and non-financial economic activity in capitalist economies, is concerned with broad credit conditions – the amount of borrowing and lending. The modern financial system is flexible enough to accommodate the demand for credit. Investment demand generates a commensurate level of saving. The equilibrating mechanism between investment demand and the willingness to save is the level of aggregate income which is similar to the Keynesian view. In an open economy, the investment-saving gap or the current account deficit could be financed with matching international capital flows. It could be finance, not saving, that acts as a constraint on investment (Asimakopolus, 1986).

Exploring the links between corporate saving and investment, Fazari et.al (1998) found that under liquidity constraints, firms take recourse to saving only for financing investments. Hence, investment decisions should explain a substantial component of saving (Agosin, 2001). Firms are intrinsically guided not by prior saving but by their profit expectations and credit availability for financing investment decisions. Financial savings translate into productive investments in a stable and conducive macroeconomic environment.

[1] I am grateful to the anonymous referee for pointing out this important line of enquiry.

independent of household saving decisions and even of central banks' strategic intervention. Of course, all else being equal, an initial increase in investment will exert upward pressure on the interest rate. However, what is contested here is the existence of a quantum of prior saving flows that can counteract this upward interest rate pressure. We conjecture that, given a financial structure, there are numerous ways in which financial variables such as, central bank policy, bank and public's (non-financial businesses' and households') liquidity preference schedules and the innovative capacity of financial intermediaries will have a greater influence than saving in determining investment activity as well as the interest rate response to the rise in investment . In a nutshell, consumption (saving), lending and investment are linked to income not so much with interest rate movements.

3. EMPIRICAL ISSUES FOR EXPLORATION

The above account throws up some important empirical issues for exploration. Does prior saving act as a constraint on investment? If so, how much influence does saving have on the availability of credit and on interest rates? To what extent are lending flows independent of saving flows? If lending flows rise more rapidly than saving, for any increase in the demand for credit, to what extent is the level of interest rates affected? By virtue of established theory, interest rate levels will rise when lending grows more rapidly than saving. However, a more comprehensive thesis would be the investigation of interest rate levels as a function of lending or saving flows or as a function of changes in the macroeconomic environment. Do business cycle phases influence interest rate levels? Do inflationary expectations affect interest rate movements? It would be interesting to observe these interrelationships among saving, lending and interest rates in the Indian economy not only for understanding the behaviour of these financial variables but also for drawing policy implications for meaningful monetary policy formulation in a deregulated regime.

aggregate measure, and in the disaggregated form, gross household saving (*ghs*) and gross corporate saving (*gcs*), for ensuring the robustness of the empirical relationship. The *gcs* includes economic depreciation allowances in it and hence *gps*. As Pollin and Justice (1994) point out, this inclusion is important since depreciation allowances are a substantial source of funds, mainly taking the form of short-term deposits with intermediaries, thus contributing to their lending capacity. Moreover, depreciation allowances service wear and tear costs as also finance the capital stock. However, we also consider that net private saving measures net household saving (*nhs*) and net corporate saving (*ncs*). We also look at household financial saving (*hfs*) since in India, unlike in the developed economies where corporate saving is the major constituent, household saving is the major component of total savings and within it household financial savings is an important portion. Moreover, our choice of the above variable is driven by important theoretical considerations. For, if saving influences lending flows, it is not total private saving but the financial form of saving that is the focal variable. After all, lending flows are financial flows. If domestic credit is the primary asset backing the monetary liabilities of the banking system, it is financial saving which indicates the extent to which the supply of credit given by the financial system can be increased (Fry, 1988). And it is the financial saving which would be sensitive to interest rate movements. We take recourse to various issues of the National Accounts Statistics (NAS) and Central Statistical Organisation (CSO) for collecting data on the above variables.

The measurement difficulty extends, more importantly, to choosing an appropriate variable for capturing lending or credit flows. We do not have a good measure of credit availability in the system. Can commercial bank credit to the commercial sector be a good proxy for the above? Almost all the empirical studies conducted in India consider bank credit as a proxy for credit availability. This may not be a good measure for our empirical exercise since our objective is to capture how the structure and the behaviour of financial institutions influence the provision of credit and specifically the extent to which, through financial market practices, the institutions (*ofi*). The variable can be derived by netting out the loans and advances by the rest of the world and the government sector from the total loans and advances in the domestic economy. It is constructed by summing the data on loans and advances from the *uses* column of the banking, *ofi*, *pcb* and *hhs* given in the *financial flows - instrument-wise* classification of the flow of funds account. The definition may not be able to capture the total financial flows in the form of lending which is channelled through the capital market. Deficit units have recourse to the mobilisation of resources by floating equities and surplus units purchase these equities as a form of investment. From the point of view of the system, such investment by surplus units can be viewed as one form of lending to deficit units. In order to capture these significant leakages from surplus units which the former definition of lending or credit flows may fail to do, we follow Pollin and Justice (1994). This definition of aggregate lending (*agl*) by private domestic units includes the direct lending of private savers, their purchase of financial assets from nonfinancial units and the lending by domestic financial intermediaries to the ultimate borrowers. To avoid double counting, this definition of lending would then have to exclude the lending by private units to intermediaries. We measure the aggregate lending by private domestic units, in this wider sense, by adding up the data on (i) total financial flows from the banking and *ofi* to all other sectors (ii) financial flows from *pcb* to government and *hhs*, and (iii) financial flows from *hhs* to *pcb* and government. In order to avoid double counting, we subtract from the above (i) financial flows from *pcb* to banks and *ofi*, and (ii) financial flows from *hhs* to banks and *ofi*. The data is sourced from the *uses* column of the respective sectors as given in the *financial flows - sector-wise* classification of the flow of funds account.

Conventional wisdom is that, other things being equal, interest rates should rise when lending flows increase in relation to saving flows. This is because financial intermediates reduce their liquidity position as well as undertake risk while purchasing investor's bonds in anticipating that they can profitably sell the bonds at a future date. The empirical issue at hand is to observe whether interest rates rise for any increase in the lending-saving ratio (*ls*), and if they do, then to representative (short-term) interest rate (*ir*). Generally, the representative interest rate should reflect returns on government securities to approximate the return on riskless assets. However, money market rates also are used as the representative (short-term) real interest rates (Chadha and Dimsdale, 2000) as they approximate marginal borrowing costs of the private sector though they include risk premia in comparison with government securities (Ford and Laxton, 2000). Recent studies on financial integration suggest that the Treasury bill rate and call money rate are highly correlated (Taylor, 2000) and that changes in monetary policy have immediate effects on these segments of the financial market (Bhattacharya and Sensarma, 2005). The changes in the call money rate will adequately reflect underlying changes in the marginal cost of borrowing from the banking sector, the leading source of short-term finance to private corporate business. Banks and other financial institutions are major players both in the markets for money and credit. Also, an important consideration specifically for India is that the call money rate is the only interest rate variable determined by market forces throughout[2] the pre 1990s for which historical data are available. We make use of the RBI Report on Currency and Finance (various issues) and Handbook of Statistics on the Indian Economy (2001) for the data on interest rates.

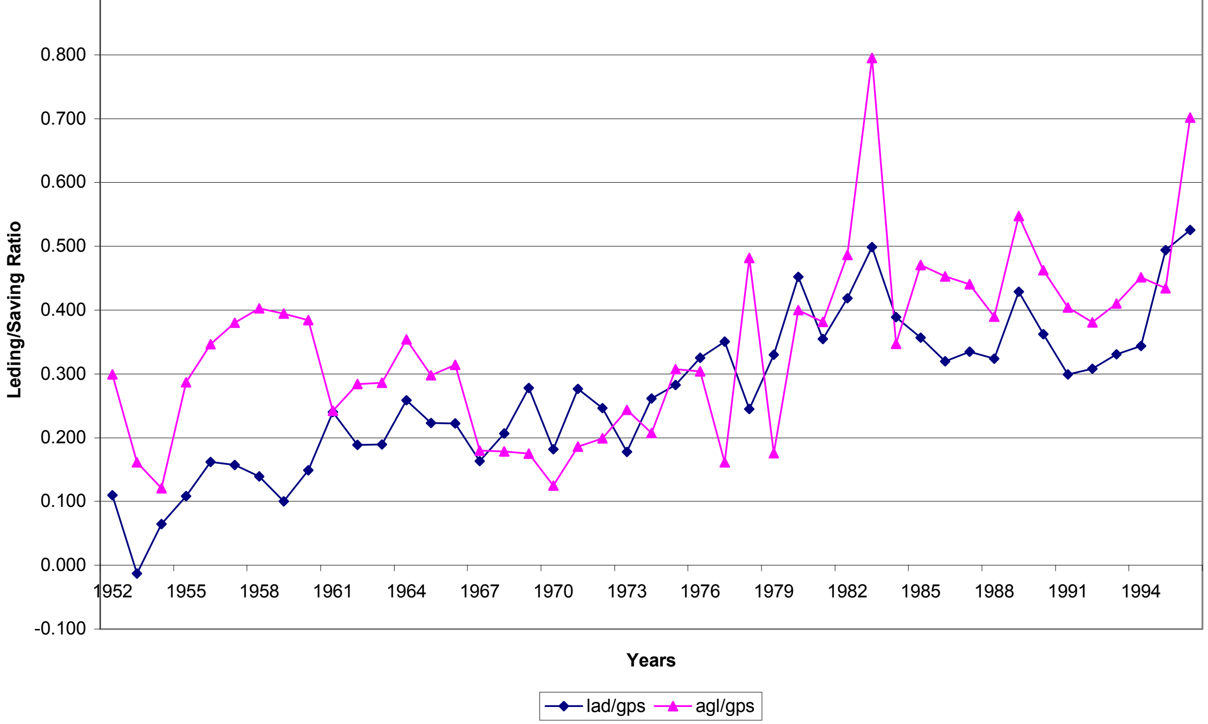
In order to test for the effects of variations in lending relative to the saving flows flows on interest rate levels, different *ls* ratios are constructed using six alternative measures of saving and two alternative measures of lending (see Section 5.1 and 6). Besides the control variables, macroeconomic aggregates, which are expected to exert an independent influence, are used. First, the rate of change in real gross domestic product (Δgdp) is used as a proxy for capturing effect of the business cycle phase. Generally, interest rates are viewed as pro-cyclical. With the expansion in economic activity, for any rise in income during the upward phase of the business cycle, firms expect a rise in aggregate demand, and therefore, the demand for credit goes up. At the cyclical peaks, in response to the expectations-driven investment boom, the monetary authority may take recourse to tight monetary policy, which is transmitted through the

[2] Though it must be noted that for sometime there was a ceiling of 10 per cent on the call money rate.

dummy variables to see whether structural changes have had any effect on the interrelationships among financial variables. The inflation rate (*inf*), measured here by the change in the implicit *gdp* deflator, is used as another control variable rather than directly deflating nominal interest rates. Here, the inflation rate is the realised ex post inflation rate but not a calculated measure of expected inflation. Since we use the call money rate, a representative short-term interest rate, the systematic errors are negligible in forecasting inflation over shorter time horizons, making actual inflation a good proxy for expected inflation. We utilise various issues of the National Accounts Statistics for the data both on *gdp* and *inf*. We have also included the foreign lending flows to private domestic units as one of the control variables. This is included as a ratio of foreign funds available to private domestic units to the total lending flows (*fl*). Foreign funds may offset domestic credit constraints and thus counteract the interest rate pressure for any rise in the *ls* ratio. We measure *fl* by arriving at total financial flows from rest of the word to (i) banks and *ofis*, and (ii) *pcb* and *hhs*. The data is sourced from the *sources* column of the respective sectors as given in the *financial flows - sector-wise* classification of the flow of funds account. However, we do not expect *fl* to have any significant influence on the interest rate in India because the Indian economy was inward looking for long, subjected to various restrictions both on the inflow and the outflow of funds. All the same, we do not want to prejudge the effect. We have used annual time series data from 1951-52 to 1995-1996 first to overcome the unavailability of high frequency monthly data. Secondly, our interest is in the long-term equilibrium relationship among these macroeconomic aggregates, saving, lending and the interest rate, irrespective of the structural change in the macroeconomy.

5. ECONOMETRIC METHODOLOGY AND RESULTS

A simple plot of the broadest measures of the *ls* ratio (*lad/gps* and *agl/gps*) shows that though both have been growing over time, their relationship is not stable with their rates of growth varying cyclically and over the long period. Looking at both the ratios, lending as a



With these simple observations, we proceed to investigate the causal linkages between lending and saving flows, employing time series techniques.

5.1 UNIT ROOT TESTS

In order to explore the relationship between saving and lending behaviour, we begin with the test of the time-series properties of the data. The Dickey-Fuller (DF) and the Augmented Dickey-Fuller (ADF) unit root tests are employed to establish that the concerned series is I(0) and the order of the series is the same. However, the distribution theory supporting the Dickey-Fuller test assumes that the errors are statistically independent and have a constant variance. Since long time series data is subjected to distributional changes, the alternative Phillips and Perron (1988) (PP) unit root test would be more suitable. PP developed a generalisation of the

Table 1: PP Unit Root Tests

Variable	Equation Specification and Phillips-Perron t-statistics		Statistical Inference
	Constant but no trend	Constant and trend	
gps			
• Log Levels	-0.171	-3.126	Non-Stationary
• First Difference	-6.646	-6.552	=> I(1)
ghs			
• Log Levels	-0.466	-3.767	Trend Stationary => I(0)
gcs			
• Log Levels	-1.746	-2.209	Non-Stationary
• First Difference	-7.697	-7.655	=> I(1)
hfs			
• Log Levels	-3.626	-8.106	Trend Stationary => I(0)
nhs			
• Log Levels	-0.753	-4.906	Trend Stationary => I(0)
ncs			
• Log Levels	-1.957	-3.948	Trend Stationary => I(0)
lad			
• Log Levels	-1.557	-5.987	Trend Stationary => I(0)
agl			
• Log Levels	-0.017	-3.853	Trend Stationary => I(0)

Notes: 1. All the variables are measured in real terms using the implicit GDP deflator at 1993-94 prices.
2. All the variables are expressed in natural logarithms.
3. The 95 per cent critical value for the PP t-statistics is -2.9286 and -2.303 for the regression with constant but no trend and -3.5136 and -3.5162 for the regression with constant and trend for all the variables in their log levels and first differences respectively, except for *lad*. Since the *lad* contained a negative value in the year 1952-53, the stationarity test was conducted for 1953-54 to 1995-96. The 95 per cent critical value for the PP t-statistics is -2.9320 for the regression with constant but no trend and -3.5189 for the regression with constant and trend for the variable *lad*.

Source: National Account Statistics, CSO, Various Issues
Flow of Funds Account, RBI, August 2000

The PP unit root tests for stationarity show that different measures of saving and lending are of different order of integration. The *gps* and *gcs* are non-stationary with I(1) time series properties while all other saving and lending flow measures are stationary or I(0) variables. Since both the measures of lending as well as most of the saving measures are stationary, it is not possible to statistic under the null is asymptotically distributed as the chi-square (CHSQ) variate. This test provides a statistical measure of the extent to which lagged values of a set of variables are important in predicting another set of variables once lagged values of the latter are included in the model. It may be noted that the Granger non-causality test may give misleading results if the variables in the VAR contain unit roots. Therefore, we include the first differences of all those saving measures which are I(1). Before conducting the VAR exercise, the selection of the order of the VAR is important, since there is a size-power trade-off depending on the order of augmentation used to deal with the problem of residual serial correlation. For detecting the true order of augmentation, which is not known a priori, we have used appropriate model selection criteria of maximising the Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC). It may so happen that different model selection criteria lead to different models and there is a conflict between the two criteria. The SBC dominates the AIC since the SBC leads to a parsimonious model. Once we have obtained the optimal order of the VAR as one (1) on the basis of the SBC in all the cases, we proceed to test the null hypothesis of Granger non-causality of a particular variable for another variable, using this order of lags. The computed CHSQ test statistic for the null hypothesis of no causation running from saving and lending variables and vice versa is given in Table 2.

Table 2: Test of Granger's Block Causality in a VAR Framework under the Null Hypothesis of 'No Block Causality'

Hypothesis X causes Y ($X \rightarrow Y$)	CHSQ Test Statistic χ^2 (p)	Reject/Do not Reject Null Hypothesis	Statistical Inference
$\Delta gps \rightarrow lad$	1.9228 (0.166)	Do Not Reject	No Causality
$lad \rightarrow \Delta gps$	0.22108 (0.638)	Do Not Reject	
$\Delta gps \rightarrow agl$	0.12385 (0.725)	Do Not Reject	No Causality
$agl \rightarrow \Delta gps$	0.13640 (0.907)	Do Not Reject	
$ghs \rightarrow lad$	0.68347 (0.408)	Do Not Reject	No Causality
$lad \rightarrow ghs$	0.69924 (0.403)	Do Not Reject	
$ghs \rightarrow agl$	0.95506 (0.328)	Do Not Reject	No Causality

$ncs \rightarrow lad$	0.073962 (0.786)	Do Not Reject	No Causality
$lad \rightarrow ncs$	1.8254 (0.177)	Do Not Reject	
$ncs \rightarrow agl$	5.6161 (0.018)	Reject	*ncs* Granger causes *agl*
$agl \rightarrow ncs$	0.11357 (0.736)	Do Not Reject	

Notes: 1. All the variables are in real terms, deflated by the implicit GDP deflator at 1993-94 prices.
2. All the variables are in natural logarithms.
3. The figures in the parenthesis are probability values.
4. The estimation is based on 43 observations from 1953-94 to 1995-96 except for Δgps and Δgcs for which the estimation is based on 42 observations from 1954-55 to 1995-96.
5. In the construction of VAR, the deterministic component contained an intercept and trend for all the variables taken in log levels except for the first difference variables in which case the deterministic component contained an intercept only.

Source: Same as Table 1

These results robustly fail to reject the null hypothesis of no causation running from different saving and lending flows and vice versa. Only in the case of *hfs* and *ncs* is there unidirectional Granger causality running from *hfs* to *lad* (weakly) and *agl*, and *ncs* to *agl*. It is quite expected that financial savings influence lending flows, especially corporate sector recourse to borrowings when they find decline in retained savings. But since total private savings are not showing any causality, therefore, we may infer that lending flows are not directly dependent on saving flows, but central bank policy and the financial institutional structure may have influenced the lending flows, the former, in turn, being influenced by the macroeconomic environment.

6. LENDING, SAVINGS AND INTEREST RATES

Following the general to specific modelling approach, we formulate a fairly unrestricted dynamic model in an autoregressive distributed lag (ADL) form, which is subsequently tested, transformed through testing of various linear and nonlinear restrictions and reduced in size by imposing a number of test restrictions that the data allows and that also would be consistent with an economic-theoretic interpretation (Charemza and Deadman, 1992; Hendry, 1995). The ADL model has a number of advantages over the traditional models. It minimises the possibility of estimating spurious relations while retaining long run information (Hendry, 1995). Moreover, it provides for estimating lag effects without arbitrarily constraining the lag structure a priori. In further obtained by progressively removing explanatory variables with insignificant coefficients. As expected, the *fl* variable was found to be totally insignificant in all the estimated equations and hence it is dropped in the final estimation. We have also tried to measure the broad effects of structural change in financial markets on the saving, lending and interest rates relationship by introducing dummies, one for the seventies and the other for the late eighties, but both the dummies turned out to be insignificant. The final parsimonious estimated equations, together with a set of commonly used diagnostic statistics are reported in Tables 3 to 14. The long-run elasticities relating to the key explanatory variables computed from the estimated equations are also given. As reported, these equations pass all diagnostic tests[3] confirming that all the regression estimations follow the classical normality assumptions and hence the results are free from bias.

Table 3: Influence of *ls* Ratio on *ir* Levels

Autoregressive Distributed Lag Estimates Dependent Variable is Δir 42 Observations used for estimation from 1954-55 to 1995-96		
Explanatory Variables	Coefficient	t-Ratio (Probability)
$\Delta ir(-1)$	0.185	1.319 (0.20)
$\Delta ir(-2)$	-0.637	-4.883 (0.00)
$\Delta ir(-3)$	-0.335	-1.943 (0.06)
ls (lad/gps)	-0.061	-1.913 (0.06)
Δgdp	0.072	0.787 (0.44)
$\Delta gdp(-1)$	0.347	3.490 (0.00)
inf	0.200	3.161 (0.00)
R^2=0.65, $\overline{R}^2$=0.57, S.E.=1.64, F(7, 34)=8.89, DW-Stastic=2 .11 LM(Residual Serial Correlation)–F(1, 33)=0.486(0.49), RESET-F(1, 33)=0.127(0.72), JBN-χ^2(2)=0.009(0.99), LM(Heteroscedasticity)–F(1,40)=0.791(0.38)		
Estimated Long Run Coefficients Dependent Variable is Δir		
Explanatory Variables	Coefficient	t-Ratio (Probability)

[3] Also, the estimation process qualified for the cumulative sum of squares test on the recursive residuals (CUSUM) and the CUSUMSQ test, confirming parameter stability over the estimation period.

Table: 4 Influence of *ls* Ratio on *ir* Levels

Autoregressive Distributed Lag Estimates Dependent Variable is Δir 42 Observations used for estimation from 1954-55 to 1995-96		
Explanatory Variables	Coefficient	t-Ratio (Probability)
$\Delta ir(-1)$	0.182	1.274 (0.21)
$\Delta ir(-2)$	-0.575	-4.383 (0.00)
$\Delta ir(-3)$	-0.319	-1.814 (0.07)
ls (lad/gcs)	-0.004	-1.518 (0.13)
Δgdp	0.046	0.515 (0.61)
$\Delta gdp(-1)$	0.305	3.229 (0.00)
inf	0.169	2.878 (0.00)
R^2=0.63, $\overline{R}^2$=0.55, S.E.= 1.69, F(7, 34)=8.40, DW-Statistic=2.02 LM(Residual Serial Correlation)-F(1, 33)=0.038(0.85), RESET-F(1, 33)=0.008 (0.93), JBN-χ^2(2)=0.910(0.63), LM (Heteroscedasticity)-F(1,40)=0.275(0.60)		
Estimated Long Run Coefficients Dependent Variable is Δir		
Explanatory Variables	Coefficient	t-Ratio (Probability)
ls (lad/gcs)	-0.003	-1.416 (0.150)
Δgdp	0.205	1.996 (0.054)
Δinf	0.099	2.541 (0.016)

Notes: The same as Table 3

Source: The same as Table 1

Table 5: Influence of *ls* Ratio on *ir* Levels

Autoregressive Distributed Lag Estimates Dependent Variable is Δir 42 Observations used for estimation from 1954-55 to 1995-96		
Explanatory Variables	Coefficient	t-Ratio (Probability)
$\Delta ir(-1)$	0.187	1.334 (0.19)
$\Delta ir(-2)$	-0.652	-4.929 (0.00)
$\Delta ir(-3)$	-0.341	-1.975 (0.06)
ls	-0.053	-1.892 (0.07)
Δgdp	0.072	0.788 (0.44)
$\Delta gdp(-1)$	0.348	3.479 (0.00)
inf	0.200	3.150 (0.00)
R^2=0.65, $\overline{R}^2$=0.57, S.E.= 1.64, F(7, 34)=8.86, DW-Statistic=2.11 LM(Residual Serial Correlation)-F(1, 33)=0.491(0.49), RESET-F(1, 33)=0.204 (0.65), JBN-χ^2(2)=0.009(0.99), LM (Heteroscedasticity)-F(1,40)=1.011(0.32)		

42 Observations used for estimation from 1954-55 to 1995-96

Explanatory Variables	Coefficient	t-Ratio (Probability)
Δir(-1)	0.385	2.979 (0.00)
Δir(-2)	-0.806	-5.770 (0.00)
ls) *(lad/ncs)*	-0.0003	-0.288 (0.78)
ls(-1) *(lad/ncs)*	0.0002	1.919 (0.06)
ls(-2) *(lad/ncs)*	-0.0002	-2.451 (0.02)
Δgdp	0.051	0.584 (0.56)
Δgdp(-1)	0.207	2.298 (0.03)
inf	0.110	2.004 (0.05)
Intercept	-1.404	-1.619 (0.11)
R^2=0.65, $\overline{R}^2$=0.57, S.E.= 1.65, F(8, 33)=7.74, DW-Statistic=2.27 LM(Residual Serial Correlation)-F(1, 32)=1.510(0.23), RESET-F(1, 32)=0.651 (0.43), JBN-χ^2(2)=2.199(0.33), LM (Heteroscedasticity)-F(1,40)=0.088(0.77)		
Estimated Long Run Coefficients Dependent Variable is Δir		
Explanatory Variables	Coefficient	t-Ratio (Probability)
ls (lad/ncs)	-0.00003	-0.432 (0.67)
Δgdp	0.182	1.673 (0.10)
inf	0.077	1.889 (0.07)
Intercept	-0.988	-1.513 (0.12)

Notes: The same as Table 3

Source: The same as Table 1

Table 7: Influence of *ls* Ratio on *ir* Levels

Autoregressive Distributed Lag Estimates Dependent Variable is Δir 42 Observations used for estimation from 1954-55 to 1995-96		
Explanatory Variables	Coefficient	t-Ratio (Probability)
Δir(-1)	0.189	1.339 (0.19)
Δir(-2)	-0.642	-4.857 (0.00)
Δir(-3)	-0.391	-2.200 (0.03)
ls (lad/hfs)	-0.022	-1.784 (0.08)
Δgdp	0.031	0.367 (0.72)
Δgdp(-1)	0.316	3.364 (0.00)
inf	0.177	3.021 (0.00)
R^2=0.64, $\overline{R}^2$ =0.57, S.E.= 1.65, F(7, 34)=8.72, DW-Statistic=2.01 LM(Residual Serial Correlation)-F(1, 33)=0.009(0.92), RESET-F(1, 33)=0.102 (0.75), JBN-χ^2(2)=0.255(0.88), LM (Heteroscedasticity)-F(1,40)=0.716(0.40)		

Explanatory Variables	Coefficient	t-Ratio (Probability)
$\Delta ir(-1)$	0.199	1.448 (0.16)
$\Delta ir(-2)$	-0.662	-5.324 (0.00)
$\Delta ir(-3)$	-0.334	-3.251 (0.00)
ls (lad/nhs)	-0.049	-3.216 (0.00)
Δgdp	0.063	0.736 (0.47)
$\Delta gdp(-1)$	0.369	3.765 (0.00)
inf	0.182	3.424 (0.00)
R^2=0.66, $\overline{R}^2$=0.59, S.E.= 1.60, F(7, 34)=9.54, DW-Statistic=2.01 LM(Residual Serial Correlation)-F(1, 33)=0.221(0.64), RESET-F(1, 33)=0.080 (0.78), JBN-χ^2(2)=0.323(0.85), LM (Heteroscedasticity)-F(1,40)=0.755(0.39)		
Estimated Long Run Coefficients Dependent Variable is Δir		
Explanatory Variables	Coefficient	t-Ratio (Probability)
ls (lad/nhs)	-0.027	-2.296 (0.03)
Δgdp	0.240	2.461 (0.02)
inf	0.110	3.020 (0.01)

Notes: The same as Table 3
Source: The same as Table 1

Table 9: Influence of *ls* Ratio on *ir* Levels

Autoregressive Distributed Lag Estimates Dependent Variable is Δir 42 Observations used for estimation from 1954-55 to 1995-96		
Explanatory Variables	Coefficient	t-Ratio (Probability)
$\Delta ir(-1)$	0.388	3.116 (0.00)
$\Delta ir(-2)$	-0.758	-5.798 (0.00)
ls (agl/gps)	-0.048	-2.174 (0.04)
Δgdp	0.067	0.755 (0.46)
$\Delta gdp(-1)$	0.329	3.569 (0.00)
inf	0.162	2.902 (0.00)
R^2=0.62, $\overline{R}^2$ =0.56, S.E.= 1.67, F(6, 35)=9.65, DW-Statistic=2.08 LM(Residual Serial Correlation)-F(1, 34)=0.205(0.65), RESET-F(1, 34)=0.122 (0.73), JBN-χ^2(2)=2.389(0.30), LM (Heteroscedasticity)-F(1,40)=0.803(0.37)		
Estimated Long Run Coefficients Dependent Variable is Δir		
Explanatory Variables	Coefficient	t-Ratio (Probability)

ls (agl/gcs)	-0.003	-2.124 (0.04)
Δ*gdp*	0.058	0.661 (0.51)
Δ*gdp*(-1)	0.303	3.386 (0.00)
inf	0.151	2.757 (0.01)
R^2=0.62, $\overline{R}^2$ =0.56, S.E.= 1.67, F(6, 35)=9.56, DW-Statistic=2.03 LM(Residual Serial Correlation)-F(1, 34)=0.054(0.82), RESET-F(1, 34)=0.015 (0.90), JBN-χ^2 (2)=2.936(0.23), LM (Heteroscedasticity)-F(1,40)=0.040(0.84)		
Estimated Long Run Coefficients Dependent Variable is Δ*ir*		
Explanatory Variables	Coefficient	t-Ratio (Probability)
ls (agl/ncs)	-0.003	-2.041 (0.05)
Δ*gdp*	0.271	2.211 (0.03)
inf	0.114	2.466 (0.02)

Notes: The same as Table 3
Source: The same as Table 1

Table 11: Influence of *ls* Ratio on *ir* Levels

Autoregressive Distributed Lag Estimates Dependent Variable is Δ*ir* 42 Observations used for estimation from 1954-55 to 1995-96		
Explanatory Variables	Coefficient	t-Ratio (Probability)
Δ*ir*(-1)	0.391	3.111 (0.00)
Δ*ir*(-2)	-0.768	-5.755 (0.00)
ls (agl/ghs)	-0.040	-2.090 (0.04)
Δ*gdp*	0.066	0.741 (0.46)
Δ*gdp*(-1)	0.330	3.517 (0.00)
inf	0.162	2.876 (0.00)
R^2=0.62, $\overline{R}^2$ =0.55, S.E.= 1.68, F(6, 35)=9.51, DW-Statistic=2.09 LM(Residual Serial Correlation)-F(1, 34)=0.271(0.61), RESET-F(1, 34)=0.190 (0.67), JBN-χ^2 (2)=2.280(0.32), LM (Heteroscedasticity)-F(1,40)=1.218(0.28)		
Estimated Long Run Coefficients Dependent Variable is Δ*ir*		
Explanatory Variables	Coefficient	t-Ratio (Probability)

Δ *ir*(-3)	-0.377	-2.113 (0.00)
ls (agl/ncs)	-0.00001	-0.202 (0.84)
ls (agl/ncs)(-1)	0.0002	1.834 (0.07)
Δ *gdp*	-0.060	-0.071 (0.94)
Δ *gdp*(-1)	0.202	2.190 (0.04)
inf	0.122	2.212 (0.03)
Intercept	-1.446	-1.645 (0.11)

R^2=0.64, $\overline{R}^2$ =0.56, S.E.= 1.67, F(8, 33)=7.50, DW-Statistic=1.86
LM(Residual Serial Correlation)-F(1, 32)=0.351(0.59), RESET-F(1, 32)=0.897 (0.35), JBN-χ^2 (2)=0.900(0.64), LM (Heteroscedasticity)-F(1,40)=0.019(0.89)

Estimated Long Run Coefficients
Dependent Variable is Δ *ir*

Explanatory Variables	Coefficient	T-Ratio (Probability)
ls (agl/ncs)	0.0001	1.241 (0.22)
Δ *gdp*	0.107	1.241 (0.22)
Inf	0.067	2.064 (0.05)
Intercept	-0.789	-1.514 (0.14)

Notes: The same as Table 3
Source: The same as Table 1

Table 13: Influence of *ls* Ratio on *ir* Levels

Autoregressive Distributed Lag Estimates
Dependent Variable is Δ *ir*
42 Observations used for estimation from 1954-55 to 1995-96

Explanatory Variables	Coefficient	t-Ratio (Probability)
Δ *ir*(-1)	0.259	1.796 (0.08)
Δ *ir*(-2)	-0.720	-4.951 (0.00)
Δ *ir*(-3)	-0.381	-2.132 (0.04)
ls (agl/hfs)	-0.001	-2.125 (0.04)
ls(-1) *(agl/hfs)*	-0.001	-0.145 (0.89)
ls(-2) *(agl/hfs)*	0.226	2.552 (0.02)
Δ *gdp*	0.025	0.297 (0.77)
Δ *gdp*(-1)	0.223	2.576 (0.01)
inf	0.150	2.941 (0.01)

R^2=0.70, $\overline{R}^2$ =0.62, S.E.= 1.56, F(9, 32)=7.50, DW-Statistic=1.75
LM(Residual Serial Correlation)-F(1, 31)=1.212(0.28), RESET-F(1, 31)=0.246 (0.88), JBN-χ^2 (2)=0.850(0.65), LM (Heteroscedasticity)-F(1,40)=0.282(0.60)

Explanatory Variables	Coefficient	t-Ratio (Probability)
$\Delta ir(-1)$	0.388	3.116 (0.00)
$\Delta ir(-2)$	-0.758	-5.798 (0.00)
ls (agl/nhs)	-0.048	-2.174 (0.03)
Δgdp	0.067	0.755 (0.46)
$\Delta gdp(-1)$	0.273	3.460 (0.00)
inf	0.115	2.551 (0.02)
R^2=0.61, $\overline{R}^2$ =0.54, S.E.= 1.70, F(6, 35)=9.07, DW-Statistic=2.04 LM(Residual Serial Correlation)-F(1, 34)=0.079(0.78), RESET-F(1, 34)=0.256 (0.62), JBN-χ^2(2)=2.465(0.29), LM (Heteroscedasticity)-F(1,40)=0.642(0.43)		
Estimated Long Run Coefficients Dependent Variable is Δir		
Explanatory Variables	Coefficient	t-Ratio (Probability)
ls (agl/nhs)	-0.030	-1.792 (0.08)
Δgdp	0.248	2.010 (0.04)
inf	0.102	2.288 (0.03)

Notes: The same as Table 3
Source: The same as Table 1

The above results do not confirm the consumption smoothing in response to interest rate movements. Almost all the estimated equations using different saving and lending measures (refer Section 4 for the construction of and motivation for these measures), except for *agl/ncs* and *agl/nfs,* robustly show that the *ls* ratio exerts downward pressure on the interest rate. That is to say, the increase in lending flows relative to saving flows do not influence the interest rate positively. In some of the estimated equations, though the *ls* ratios have statistically significant and positive influence, their magnitude is small implying that they have only a small influence on interest rate movements even when they have a positive influence on it. The *ghs* and *nhs* and *hfs* have similar explanatory power as *gps* as they are the major components of it whereas the *gcs* and *ncs* do not explain much of the interest rate movement. Rather, the changes in the macroeconomic environment, accounting for the phase in the business cycle and inflationary expectations, significantly and substantially explain the interest rate movements. The income variable, lagged Δgdp, turned out to be the major variable in all the estimated equations. As firms expect an increase in demand in the near future, they will demand higher credit to carry out financial market was shallow and underdeveloped both in terms of the volume of transactions and the number of financial market participants, and the lack of financial institutions and instruments that would have ensured both the quantity and flow of credit. Moreover, though the estimation process qualified parameter stability tests, it must be recognised that the empirical exercise spans a long time period over which Indian economy has been subjected to many structural changes as well as policy shocks such as plan holidays, oil shock, foreign exchange crises and commencement of economic reforms in the recent years. This may possibly account for the very low power in conducting the t-tests. The question that will be asked is: Since the above empirical exercise mainly covered primarily the pre-reform administered regime, how can the statistical exercise be justified as a reflection of the equilibrium functional relationship between saving, lending and the interest rate? In such an environment, it is a complex task to establish that the regulated regime is not inconsistent with market signals. Therefore, to make the results robust, it would be useful to extend the empirical exercise explicitly to the reform period, notwithstanding the limitation of a short period of time, data lags and unavailability and the gradual introduction of market-oriented policy measures.

6.1 SUB-PERIOD ANALYSIS

The Indian financial sector has been subjected to considerable liberalisation since the late eighties with the introduction of new financial instruments and institutions. The money market developed structurally since 1989, subsequent to the broadening of the participation of entities and with the introduction of more liquid instruments such as CDs (in 1989) and CPs (in 1990). The government securities market developed to activate the Treasury bills market with the introduction of new instruments of 364-day Treasury bills and 91-day Treasury bills in April 1992 and January 1993 respectively. Since 1992-93 the market borrowing programme for the central government in dated securities has been put through an auction process. Repos for short-term liquidity management were introduced in December 1992. India moved to a market-based assets, where monetary assets include short- term banking instruments such as Treasury bills and other government bonds and commercial paper and deposits, long-term banking instruments and government bonds. It also includes currency with the public and demand and time deposits For empirical purposes, we derive a financial saving *(fs)* measure using a new aggregate liquidity measure L_2 instead of the traditional M_3 money stock, which is more comprehensive in capturing financial flows. However, following Warman and Thirlwall (1994), we net out currency with the public and demand deposits since it is not expected either that these add to the ability to create credit or that the demand for non-interest bearing assets is sensitive to the rate of interest. The second financial saving measure is the monthly accretion (variation) to the banks' aggregated deposits (*bd)*. In the absence of any good measure for lending flows, we choose monthly variation in bank credit (*bc)* as our measure of lending flows. As pointed out earlier, bank credit is often considered a useful indicator of real sector activity in agriculture and industry. The data on the concerned variables is sourced from the Handbook of Statistics on the Indian Economy, Reserve Bank of India, 2001.

6.2 UNIT ROOT TESTS

First we conduct the PP unit roots test for checking the order of integration of the data series, as shown in Table 15. Since we are working with monthly data we check for unit roots with seasonal adjustment as well.

Table 15: PP-Unit Root Tests (Monthly Series for 1993:04 to 2001:03)

Variable Annual Flows	Equation Specification and Phillips-Perron t-statistics		Statistical Inference
	constant but no trend	constant and trend	
Fs			
• Levels	-8.717	-10.533	Stationary => I(0)
• Seasonally Adjusted	-10.940	-12.693	

Granger causality.

6.3 CAUSALITY TESTS

We again employ the Granger's Block Causality test in a bivariate (VAR) framework under the null hypothesis of 'no block causality' between saving and lending flows. The optimal order of the VAR obtained was one for *bc* and *bd* and six for *bc* and *fs*. We proceed to test the null hypothesis of 'no Granger block causality' between saving and lending measures.

Table 16: Test of Granger's Block Causality in a VAR Framework under the Null Hypothesis of 'No Block Causality'

Hypothesis X causes Y ($X \rightarrow Y$)	CHSQ Test Statistic χ^2 (p)	Reject/Do not Reject Null Hypothesis	Statistical Inference
$bd \rightarrow bc$	0.377 (0.539)	Do Not Reject	*bc* Granger causes *bd*
$bc \rightarrow bd$	3.051 (0.081)	Reject	
$fs \rightarrow bc$	7.588 (0.270)	Do Not Reject	*bc* Granger causes *fs*
$bc \rightarrow fs$	12.247 (0.057)	Reject	

Notes: 1. The figures in the parenthesis are probability values
2. The optimal lag length chosen as per the SBC criterion for BD and BC is 1 and for FS and BC is 6.
3. In the construction of VAR the deterministic component included an intercept and seasonal dummies for netting out seasonal influences.

Source: Same as Table 15

The causality test shows that rather than saving determining lending flows, lending flows as proxied by bank credit Granger-cause both bank deposits and financial savings. This finding is consistent with the "credit endogenity"; reflecting Schumpeterian view of supply of credit highly elastic to credit demand at given interest rate. Loans create deposits when banks accommodate a higher demand for credit.

change in the consumer price index for industrial workers (*cpi-iw*), is used as another control variable to isolate the effect of inflation. We do not have reported data on foreign lending with monthly frequency. Therefore, we use the change in net international reserves (net foreign exchange assets) of the banking sector as a proxy for foreign lending and this has been included in the estimation process as a ratio of foreign lending to total bank credit (*fl)*. We also include the rate of change in the exchange rate (Δer), that is, in the nominal effective exchange rate (neer) of the Indian rupee, which is the index of the average with trade-based weights, of the 36-country bilateral exchange rates of the Indian rupee as an explanatory variable. It is expected that the market-determined exchange rate would influence the interest rate in the opposite direction. We also created 11 seasonal dummies to net out the monthly seasonal effects. Besides, we have introduced appropriate intercept dummies, 1994 M12 and 1995 M10 for *ls (bc/bd)* ratio and 1999 M1 for *ls (bc/fs)* ratio since these ratios displayed unusually high movements at these time points. We have accessed the data from the Handbook of Statistics on the Indian Economy, Reserve Bank of India, 2001. The ADL form could be represented as follows:

$$\Delta ir = \alpha_1 + \sum_{i=o}^{n} \psi \Delta ir_{t-i} + \sum_{i=0}^{n} \theta ls_{t-i} + \sum_{i=o}^{n} \phi \Delta iip_{t-i} + \sum_{i=o}^{n} \varphi \Delta cpi_{t-i} + \sum_{i=o}^{n} \eta fl_{t-i} + \sum_{i=o}^{n} \xi \Delta er_{t-i}$$

In addition, we have also added seasonal dummies and the intercept dummies that were found to be significant in the estimation. The results are given in Tables 17 and 18.

Table 17: Influence of *ls* Ratio on *ir* levels

Autoregressive Distributed Lag Estimates Dependent variable is Δir 90 observations used for estimation from 1993 M10 to 2001 M3		
Explanatory Variables	Coefficient	t-Ratio (Probability)
Δir(-1)	- 0.565	-7.030 (0.00)
Δir(-2)	-0.376	-4.348 (0.00)

Seasonal Dummy 9	3.536	3.258 (0.00)
Dummy 1994 M12	-330.517	-2.534 (0.01)
Dummy 1995 M10	21.131	3.496 (0.00)
R^2=0.66, $\overline{R}^2$ =0.57, S.E.= 3.31, F(18, 71)=7.65, DW-Statistic=1.90 LM(Residual Serial Correlation)-F(12, 59)=0.390(0.96), RESET-F(1, 70)=1.165 (0.28), JBN-χ^2 (2)=2.925(0.23), LM (Heteroscedasticity)-F(1,88)=1.756(0.24)		
Estimated Long Run Coefficients Dependent Variable is $\Delta\, ir$		
Explanatory Variables	Coefficient	t-Ratio (Probability)
ls (bc/bd)	0.002	2.436 (0.02)
$\Delta\, iip$	0.065	1.684 (0.10)
$\Delta\, cpi$	0.164	0.819 (0.41)
fl	-0.004	-2.397 (0.02)
$\Delta\, er$	-0.122	-0.682 (0.50)
Seasonal Dummy 7	-1.680	-3.099 (0.00)
Seasonal Dummy 9	1.594	3.102 (0.00)
Dummy 1994 M12	-149.050	-2.430 (0.02)
Dummy 1995 M10	9.529	3.258 (0.00)

Notes: The same as Table 3
Source: The same as Table 15

Table 18: Influence of *ls* Ratio on *ir* Levels

Autoregressive Distributed Lag Estimates Dependent variable is $\Delta\, ir$ 90 observations used for estimation from 1993 M10 to 2001 M3		
Explanatory Variables	Coefficient	t-Ratio (Probability)
$\Delta\, ir(-1)$	-0.579	-7.140 (0.00)
$\Delta\, ir(-2)$	-0.376	-4.349 (0.00)
$\Delta\, ir(-3)$	-0.310	-3.586 (0.00)
ls (bc/fs)	0.003	2.092 (0.04)
$\Delta\, iip$	0.110	1.306 (0.20)
$\Delta\, cpi$	0.465	1.073 (0.29)
fl	-0.002	-1.579 (0.12)
fl(-1)	0.002	0.131 (0.90)
fl(-2)	-0.001	-0.860 (0.39)
fl(-3)	-0.002	-1.576 (0.12)
fl(-4)	-0.003	-0.237 (0.81)
fl(-5)	-0.006	-5.105 (0.00)

Δiip	0.049	1.291 (0.20)
Δcpi	0.205	1.051 (0.30)
fl	-0.005	-2.929 (0.00)
Δer	-0.112	-0.638 (0.53)
Intercept	-0.310	-1.372 (0.17)
Seasonal Dummy 7	-1.812	-3.408 (0.00)
Seasonal Dummy 9	1.439	2.891 (0.01)
Dummy 1999 M1	4.110	2.342 (0.02)

Notes: The same as Table 3
Source: The same as Table 15

The empirical results suggests, as one expects, that in the deregulated regime the variations in lending relative to the saving flows are seen to exert an upward pressure on interest rate levels both in the short-run as well as in the long-run. However, the magnitude of the upward pressure is small. What is glaring is that even in the deregulated regime, the interest rate movement is negatively and substantially influenced by its own lags, suggesting interest rate rigidity in the system or financial inefficiency. Even more interesting is that the change in the domestic macroeconomic environment in the form of the business cycle and inflation do not have statistically significant positive influence on interest rate movements. The Δiip, though having a positive coefficient, weakly explains the change in interest rate both in the short- and long-run. Whereas it is statistically insignificant both in the short- and long-run in explaining the interest rate movement, when included with *bc/fs* The Δcpi was found to be, rather surprisingly, statistically insignificant though it contains a substantial positive coefficient in explaining interest rate movements both in the short- and the long-run in both the equations. In both the estimated equations, *fl* as well as Δer turn out to be the major behavioural variables explaining interest rate movements. For *fl* mostly the first and fifth lags are statistically significant with a negative coefficient in the short-run and, in turn, also significant in the long- run. The Δer substantially and statistically significantly explains the interest rate movements, but with an overall negative effect in the long-run. It has an instantaneous positive effect on the interest rate, with substantial quasi-fiscal costs, for instance, in sterilisation operations. Indeed, for the most part of the post-reform phase the central bank's monetary policy (interest rate policy) has been largely influenced by the magnitude of capital flows and consequent exchange rate movement (Pattnaik and Mitra, 2001). Nominal interest rates have been kept high against [?] in view of higher inflation rates in order to attract capital flows (Rao, 2001). Recourse had to be had to sterilisation through open market operations (OMO), which resulted in gradual accretion of capital inflows into reserves without being absorbed in the domestic economy. Rao (2001) and Mishra (2000) describe the compelling but complex dynamics of central bank monetary management in the event of foreign exchange turbulence vis-à-vis domestic macroeconomic management. Using OMO for sterilisation has restrained domestic credit expansion. Further, an excessive focus on short-term monetary management to target the interest rate, coupled with prudential regulatory norms contributed to a fall in the growth of credit.

Further, competition, opening up and an economic slowdown have driven down inflation (prices) boosting real returns on capital. But interest rates have remained high due to (i) the higher levels of market borrowing for financing the higher levels of the fiscal deficit (Mohan, 2000; Jha, 2002) due to the change in the fiscal stance from money financing to bond/debt financing, (ii) the consequence of increased government borrowing because of which the central bank imposes prudential regulatory norms with an emphasis on capital adequacy (Rao, 2001), without adequate structural reforms, especially legal ones, such as reforms of the laws relating to contract enforcement, bankruptcy and foreclosure. Especially in the absence of speedy loan recovery mechanism, banks being loaded with NPAs resort to risk-free government securities that offer market-determined interest rates (Bhattacharya and Sivasubramanian, 2001), and (iii) the prevalence of high returns on contractual forms of savings, compulsory deposits, provident funds and small savings, which act as a floor making the interest rate rigid downward (Lal, Bhide and Vasudevan, 2001).

other market determined interest rate for the longer period, call rate has been chosen as the representative interest rate. However, since the call rate represents the short-end of the market, it is too sensitive to changes in the exchange rates, and hence tend to be volatile in nature. As has been seen in our empirical results, exchange rate movements have an overweighing negative effect. Thus, unlike riskless government securities, call rates carrying underlying riskiness of financial assets, are more influenced by external movements than domestic developments. Secondly, in the post-reform phase, economic growth has been led by rapid service sector growth, which now constitutes more than 54 per cent of the GDP. The industrial sector has not only declined as a component of GDP from around 24 to 21 per cent from 1990-91 to 2000-01, but also has stagnated since the mid nineties, after attaining a double-digit growth during 1994-95 and 1995-96. In the absence of monthly data on either the service sector or agricultural sector growth, industrial growth becomes a poor proxy for capturing business cycle phases. It may have been possible to obtain a significant positive influence of income growth on interest movement in the post-reform phase had there been comprehensive monthly data on services or agricultural sector growth. These developments might be regarded as an explanation for the counter-intuitive findings that bring out the lesser relevance of domestic macroeconomic aggregates like industrial growth and the rate of inflation in explaining movements in interest rate levels. Notwithstanding these limitations, the proposition, implied by our causality tests, is that neither domestic saving nor capital flows necessarily translate into higher lending flows

The case for keeping nominal interest rates high has made borrowing abroad easier. At the same time, large foreign capital inflows appreciate the real exchange rate and may squeeze industry and agriculture profits leading to defaults and a rise in bad debts. Further freeing up interest rates and the relaxation of controls does not necessarily encourage intermediation except for increased activity in the market for short-term maturities. The impossibility trilemma is involved. A country can maintain no more than two out of the three interconnected conditions: the exchange rate level (the exchange rate regime with a managed float), the interest rate level

8 CONCLUSION

The empirical findings of saving, investment and interest rates in India have been explored. First, irrespective of the chosen measure of saving and lending, our causality tests show that there is no support to the view that saving flows determine or cause lending flows. Whereas, the analysis of financially deregulated post-reform India clearly shows that the causality, in fact, runs from lending to saving flows. Second, the deviations of lending flows from savings flows are not exerting significant upward pressure on interest rate rather interest movement is explained by domestic macroeconomic changes (as in the pre-reform period) or by external developments (as in the post-reform period. Third, the existence of interest rate rigidity or financial inefficiency even in a deregulated regime suggests that financial market is yet to become sufficiently mature.

The interpretation of our empirical analysis needs two qualifications. First, our analysis is based on long-term equilibrium relationship among these macroeconomic aggregates, saving, lending and the interest rate, irrespective of the structural change in the macro economy. Therefore, it must be recognised that since, the pre-reform analysis covers over more than four decades, subjected to many structural changes as well as policy shocks, might have possibly influenced the long-term relationship among the macroeconomic variables. Second, our use of call rate as a representative interest rate, which reflects the short-end of the market with excessive sensitivity and volatility, is based on the well grounded supposition that they do reflect the movements in marginal borrowing costs of the private sector.

These findings support the Post Keynesian case of indirect and weak links between saving and lending flows, and modern financial markets able to, within wide limits, accommodate credit demand. In other words, as Earley (1994) argued, the conclusion is not that there is no relationship between saving and lending. Rather, past savings determine the extent of lending flows but the channels of influence are indirect – the central bank's policy, the liquidity preference of intermediaries and the non-bank public determine the relationship between saving since translation of financial savings into lending flows depends on financial market behaviour, which is significantly influenced by monetary policy. The existence of interest rate rigidity suggests that financial sector reforms need to be broad based, inclusive of structural reforms. Till then, the ability of high interest rates to mobilise higher rates of savings may be found to be wanting.

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