

Section II

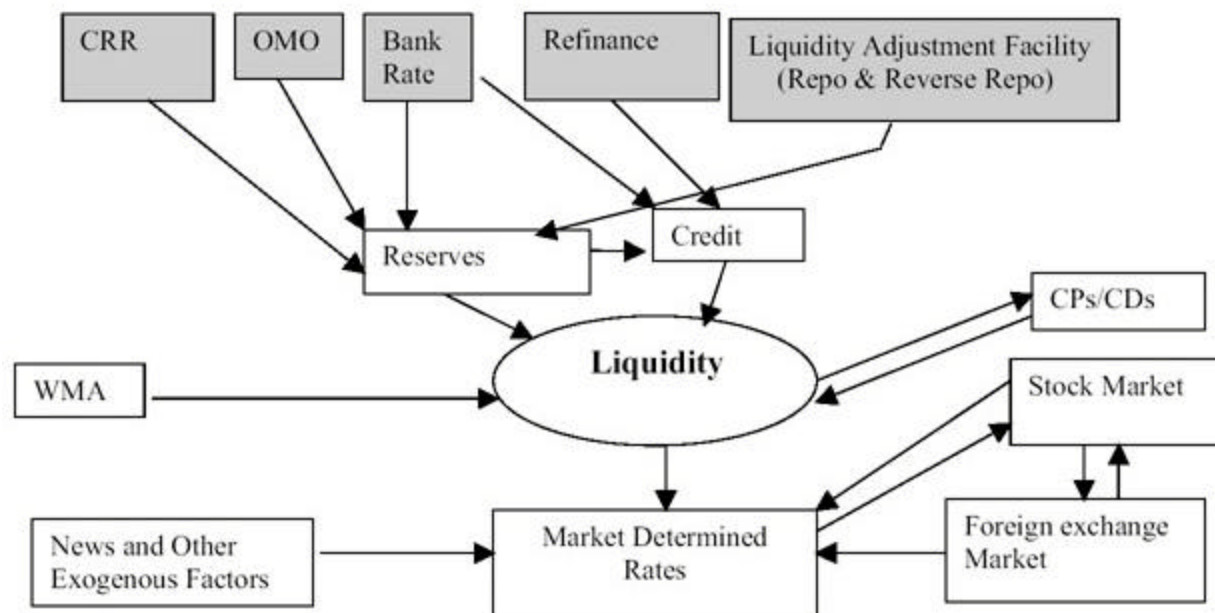
Interest Rates and Monetary Policy in India: Some Stylized Facts

The role of interest rates in the monetary policy framework has assumed increasing significance with the initiation of financial sector reforms in the Indian economy in the early 1990s and the progressive liberalisation and integration of financial markets. While the objectives of monetary policy in India have, over the years, primarily been that of maintaining price stability and ensuring adequate availability of credit for productive activities in the economy, the monetary policy environment, instruments and operating procedures have undergone significant changes. It is in this context that the Reserve Bank's Working Group on Money Supply (1998) observed that the emergence of rate variables in a liberalised environment has adversely impacted upon the predictive stability of the money demand function (although the function continues to exhibit parametric stability) and thus, monetary policy based solely on monetary targets could lack precision. The Group also underscored the significance of the interest rate channel of monetary transmission in a deregulated environment. This was, in fact, the underlying principle of the multiple indicator approach that was adopted by the Reserve Bank during 1998-99, whereby a set of economic variables (including interest rates) were to be monitored along with the growth in broad money, for monetary policy purposes. Monetary Policy Statements of the Reserve Bank in recent years have also emphasized the preference for a soft and flexible interest rate environment within the framework of macroeconomic stability.

Interest rates across various financial markets have been progressively rationalized and deregulated during the reform period (See Annexure I for Chronology of Reform Measures in respect of Monetary Policy). The reforms have generally aimed towards the easing of quantitative restrictions, removal of barriers to entry, wider participation, increase in the number of instruments and improvements in trading, clearing and settlement practices as well as informational flows. Besides, the elimination of automatic monetisation of government budget deficit, the progressive reduction in statutory reserve requirements and the shift from direct to indirect instruments of monetary control, have impacted upon the structure of financial markets and the enhanced role of interest rates in the system.

The Reserve Bank influences liquidity and in turn, short-term interest rates, via changes in Cash Reserve Ratio (CRR), open market operations, changes in the Bank Rate, modulating the refinance limits and the Liquidity Adjustment Facility (LAF) [Chart I]. The LAF was introduced in June 2000 to modulate short-term liquidity in the system on a daily basis through repo and reverse repo auctions, and in effect, providing an informal corridor for the call money rate. The LAF sets a corridor for the short-term interest rates consistent with policy objectives. The Reserve Bank also uses the private placement route in combination with open market operations to modulate the market-borrowing programme of the Government. In the post – 1997 period, the Bank Rate has emerged as a reference rate as also a signaling mechanism for monetary policy actions while the LAF rate has been effective both as a tool for liquidity management as well as a signal for interest rates in the overnight market.

Chart I: Determinants of Short-Term Interest Rates in India

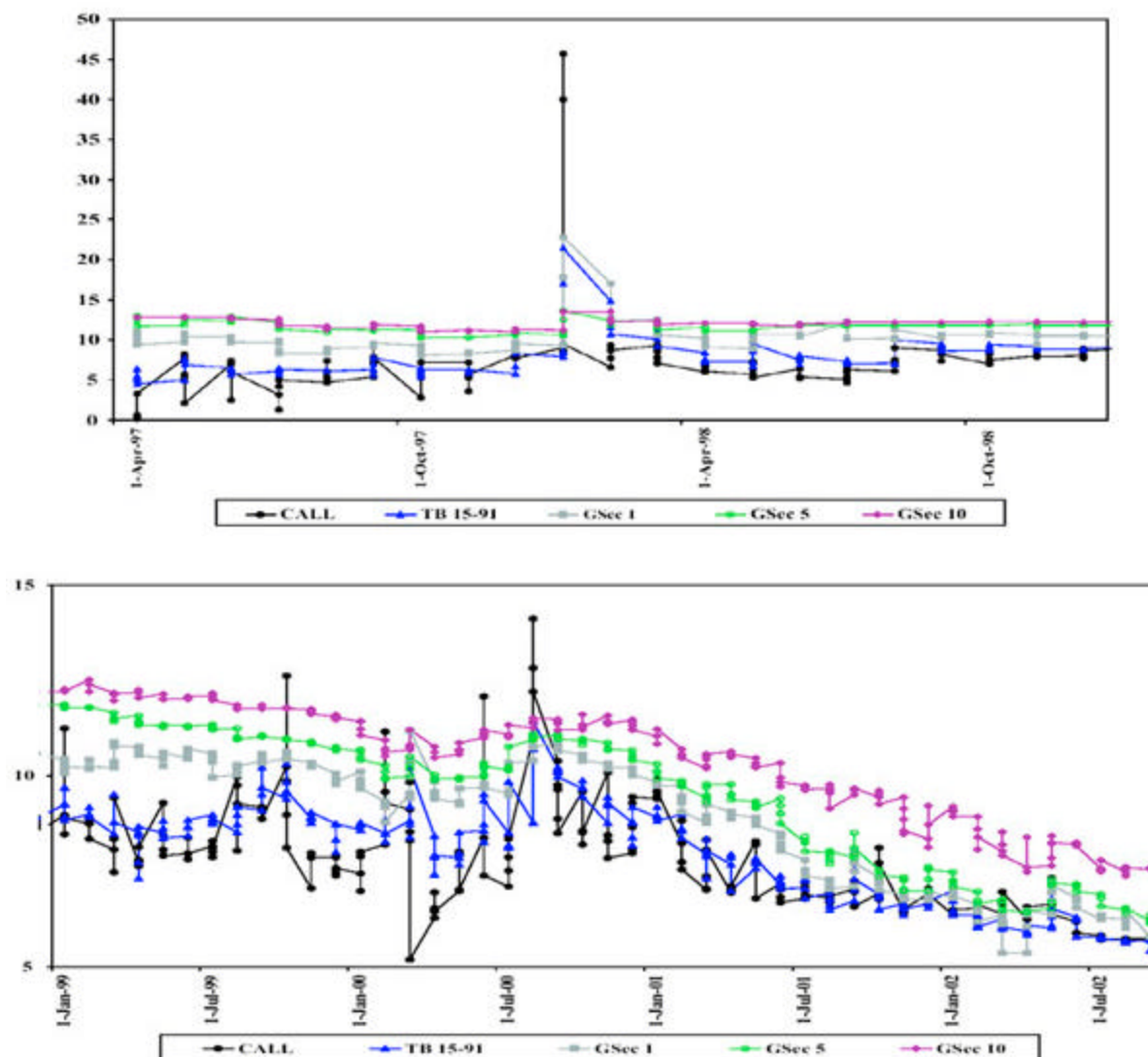


CRR: Cash Reserve Ratio; OMO: Open Market Operations; WMA: Ways and Means Advances; CD: Certificates of Deposits; CP: Commercial Paper.

The liquidity in the system is also influenced by ‘autonomous’ factors like the Ways and Means Advances (WMA) to the Government, developments in the foreign exchange market and stock market and ‘news’.

The changes in the financial sector environment have impacted upon the structure and movement of interest rates during the period under consideration (1997-2002). First, the trends in different interest rates (call money, treasury bill and government securities of residual maturities of one, five and ten years or more) are indicative of a general downward movement particularly from 2000 onwards (Charts II A and B), reflecting the liquidity impact of capital inflows and debt liquidity and debt management in the face of large government borrowings. There were, however, two distinct aberrations in the general trend during this period which essentially reflected the impact of monetary policy and other regulatory actions taken to quell exchange market pressures: the first, which occurred in January 1998 in the wake of the financial crisis in South-East Asia was, in fact, very sharp, while the second occurred around May-August 2000.

Chart IIA: Trends in Interest Rates (1997-1998)



Second, higher residual maturities have been associated with higher average levels of interest rates (reflecting an upward sloping yield curve) but lower volatility in interest rates (Table 1).

Table 1: Interest Rates – Summary Statistics
(4th Apr 1997-27th Sep 2002)

Interest Rates	Mean	Maximum	Minimum	Standard Deviation
Call	7.67	45.67 (23 rd Jan 1998)	0.18 (4 th Apr 1997)	3.46
TB15-91	7.97	21.44 (30 th Jan 1998)	4.49 (25 th Apr 1997)	1.76
Gsec1	9.34	22.86 (30 th Jan 1998)	5.37 (22 nd Mar 2002)	1.90
Gsec5	10.14	13.61 (30 th Jan 1998)	1.90 (20 th Sep 2002)	1.82
Gsec10	10.95	13.50	7.38	1.50

Third, there is evidence of progressive financial market integration as reflected in the co-movement of interest rates, particularly from 2000 onwards. The co-movement in short-term interest rates is exhibited in Charts III (A and B) and Charts IV (A and B). It may be observed that the co-movement in the call market and the three-month forward premium is particularly pronounced during episodes of excessive volatility in foreign exchange markets. Empirical exercises, as discussed subsequently, also indicate that while the impact of monetary policy changes has been readily transmitted across the shorter end of different markets, their impact on the longer end of the markets has been more limited.

Chart III A: Trends in Call Rates, Treasury Bill Rates, Repo Rates and Bank Rate (1997-1998)

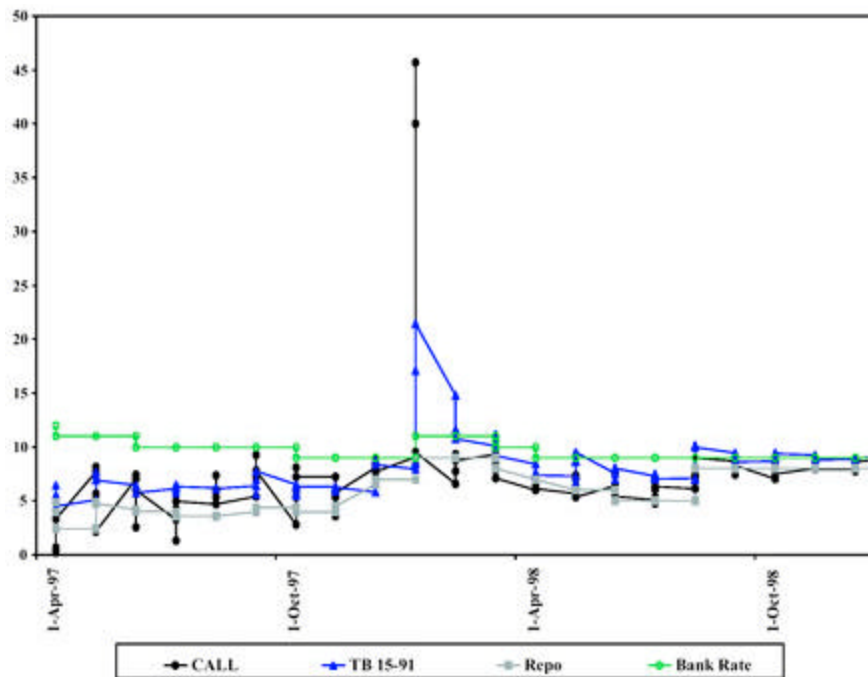


Chart III B: Trends in Call Rates, Treasury Bill Rates, Repo Rates and Bank Rate (1999-2002)

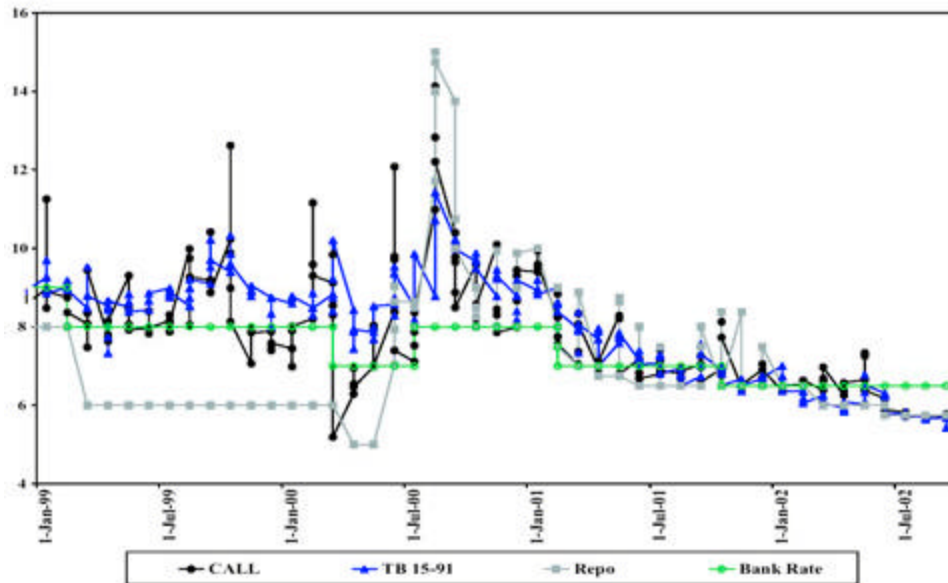


Chart IV A: Trends in Call Rates, Treasury Bill Rates, Government Security (1 year) and Forward Premium (1997-1998)

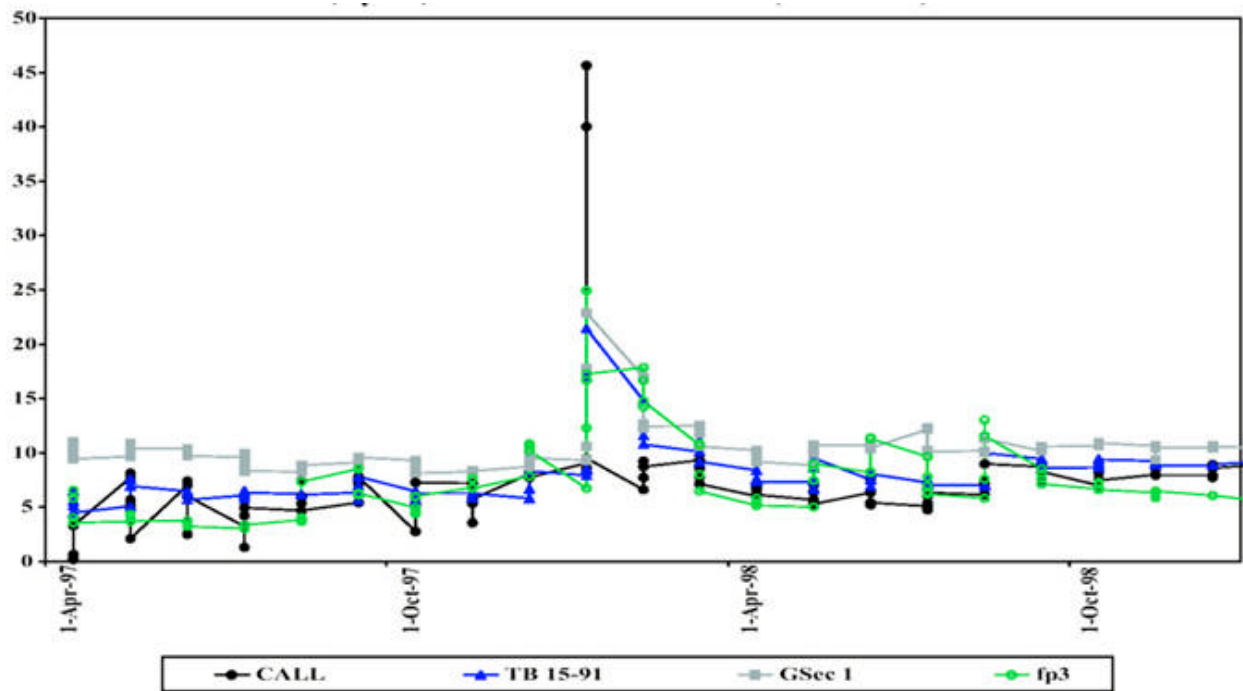
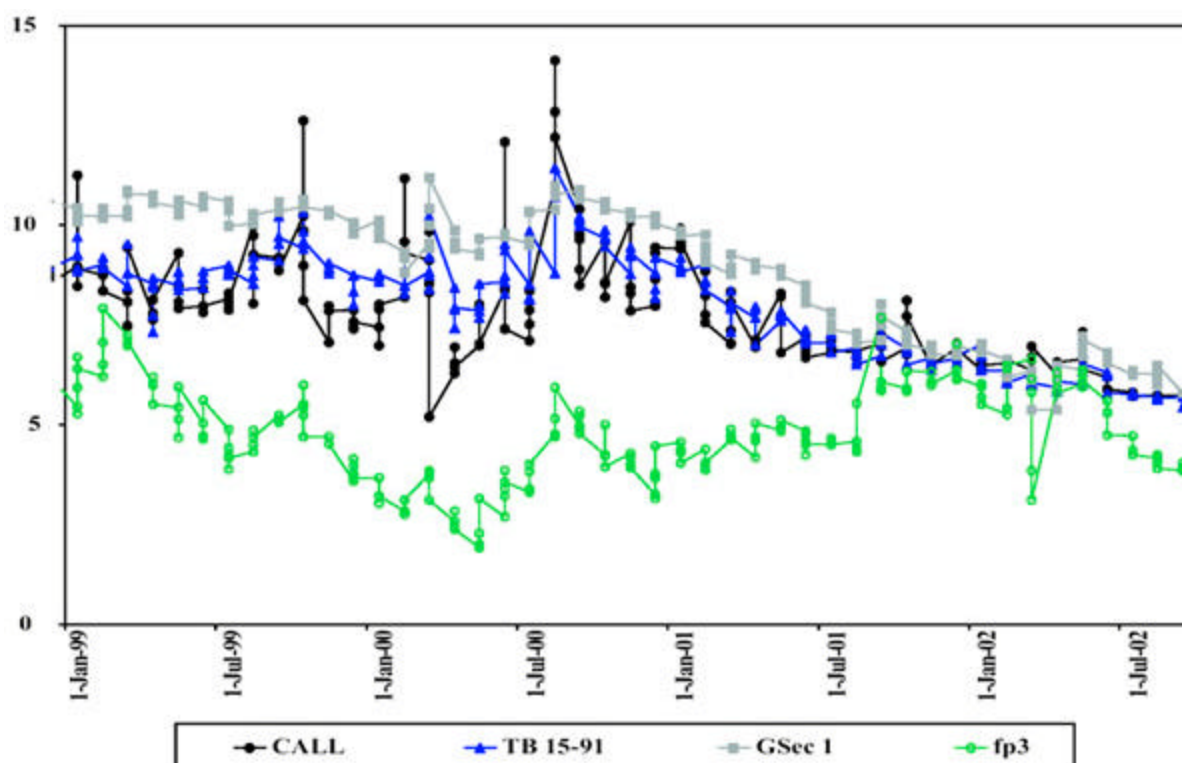


Chart IV B: Trends in Call Rates, Treasury Bill Rates, Government Security (1 year) Rate and Forward Premium (1999-2002)



The co-movement between various interest rates could also be gauged by their correlations (Table 2). The correlation between the Bank Rate and other interest rates is found to increase with the length of the maturity period; this is in contrast to the correlations observed in case of the repo rate and, to some extent, the call money rate. The Treasury Bill rate and the rates on Government securities of one, three and ten-year maturities, are found to be highly correlated.

Table 2 also reports the correlations between interest rates and a few other variables some of which have been included in the multivariate models discussed subsequently. Expectedly, both liquidity and credit are negatively correlated with interest rates and the magnitude of the correlation increases with the maturity period. In the context of the observed negative correlation between credit and interest rates, it may be noted that the notion of ‘credit’ here refers to credit supply rather than demand. Similarly, the correlation between the year-on-year inflation rate and interest rates is positive and increases with the maturity period of the securities. The yield spread shows a (weak) negative correlation with the call money rate and the Treasury Bill rate, and positive and increasing correlation with interest rates on longer term Government securities. It is also observed that the (positive) correlation of LIBOR rates (both 3-month and 6-month) with domestic interest rates increases with the length of the maturity period in sharp contrast to the correlation between forward premia and domestic interest rates.

Table 2: Correlation-Matrix
(4th Apr 1997-27th Sep 2002)

	Call	TB15-91	GSec 1	GSec5	Gsec10
Call	1.000				
TB15-91	0.503	1.000			
GSec 1	0.355	0.837	1.000		
GSec5	0.159	0.528	0.846	1.000	

Gsec10	0.164	0.456	0.839	0.984	1.000
Bank Rate	0.089	0.277	0.649	0.821	0.804
Repo Rate	0.339	0.565	0.252	0.044	0.036
Inflation (yr-on-yr)	0.116	0.322	0.417	0.450	0.425
Inflation(wk-to-wk)	-0.070	-0.014	0.026	0.054	0.017
Yield Spread	-0.105	-0.022	0.410	0.588	0.609
Liquidity	-0.083	-0.270	-0.646	-0.875	-0.868
Credit	-0.073	-0.295	-0.671	-0.907	-0.906
Libor 3-month	0.191	0.511	0.725	0.847	0.827
Libor 6-month	0.185	0.498	0.715	0.840	0.820
FP 3-month	0.440	0.440	0.444	0.238	0.232
FP 6-month	0.324	0.386	0.448	0.313	0.308