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The Fundamental Equilibrium Real Exchange Rate in India : An Approach to Estimation and Measurement of Misalignment

Himanshu Joshi*

The problem of judging whether the real exchange rate is undervalued or overvalued in relation to its long-run equilibrium path is of potential interest to policy makers responsible for the exchange rate management policy of any country. This paper attempts an estimation of the real equilibrium exchange rate for India for the period in the latter half of the 1990s using fundamental economic variables by decomposing a structural VAR vested with appropriate restrictions consistent with open economy assumptions. The model identifies the permanent impact of three fundamental structural shocks, *viz.*, real demand, supply and nominal shocks, and evaluates their relative contribution to the forecast error variance in the real exchange rate. The empirical results support the finding that the variability in the real exchange rate in India is explained predominantly by permanent real demand shocks followed by nominal and supply shocks, respectively. The significance of real demand shocks underpin the importance of the efforts of the Reserve Bank aimed at sterilizing capital inflows and maintaining stable conditions in the foreign exchange market. Since the aggregate nominal shocks explain just about 30 per cent of the forecast error variance of the real effective exchange rate, it is appropriate that under or overvaluation may not be judged solely on the basis of the relative purchasing power parity (PPP) condition.

JEL Classification : F31, F32

Keywords : Equilibrium exchange rate, structural VAR, forecast error decomposition, Harrod-Balassa-Samuelson (HBS) effect.

Introduction

The exchange rate management policy of a country is very often seized with an important question whether or not the actual real exchange rate is appropriately aligned *vis-à-vis* its long run

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equilibrium path. Notably, "the appropriateness of the exchange rate is determined by the criteria of whether the current level of the exchange rate is appropriate given the level of the exchange rate that is associated with the equilibrium situation, which is defined in terms of the goods and labor market equilibrium and the external balance being sustainable, which on the other hand is determined by the condition of the real economic variables found in equilibrium"(Omerbegivic,2005). Hence a proper assessment of the deviation of the real exchange rate from its equilibrium path can go a long way in helping policy makers to design an exchange rate policy for the purpose of achieving long term sustainability of the balance of payments.

A common method of determining the extent of misalignment of the exchange rate is based on the principle of relative uncovered purchasing power parity (PPP) theory for open economies which assumes that exchange rates adjust to offset the changes in relative prices. The PPP theory considers that the actions of importers and exporters, motivated by cross country price differences, induce changes in the spot exchange rates. In the long run, however, arbitrage ensures that the "law of one price" exists - that is identical goods denominated in a common currency must sell for the same price in two separate markets without transportation costs and differential taxes thus causing, as it were, intra national price convergence. In this process, because the adjustment in exchange rates takes place through the microeconomics of commodity market arbitrage, relative exchange rates based on relative price ratios continue to remain in a state of stable equilibrium, thus reducing the need for deliberate policy directed interventions in nominal exchange rates. In practice, however, it is an empirical question to ask if such automatic market adjustments in exchange rate exist – especially, considering the fact that the presence of non traded goods, for which no international arbitrage exists, can lead to systematic movements in real exchange rates inconsistent with PPP (Balassa,1964; Samuelson, 1964). Besides, even though deviations from the PPP may be considered to provide a meaningful ground for assessing misalignment and,

therefore, for the appropriate management of the exchange rate policy, it is experienced that except in high inflation countries where nominal shocks dominate real shocks or for countries that continued with pegged exchange rates, the PPP condition is observed more in breach than agreement with the empirical record.

The veracity of the PPP condition has been disputed particularly in the case of developing countries for the post Bretton Woods period, suggesting that the influence of other real shocks with permanent effects may be far more significant for the determination of the real exchange rate than relative prices alone. In summarising the results from studies using long-horizon data, Froot and Rogoff (1995) and Rogoff (1996) report the current consensus in the literature that the half-life of a shock (the time it takes for the shock to dissipate by 50 per cent) to the real exchange rate is about three to five years, implying a slow parity reversion rate of between 13 to 20 per cent year. Whereas the slow speed of reversion to purchasing power parity is difficult to reconcile with nominal rigidities, it is also difficult to reconcile with the observed large short-term volatility of real exchange rates (Rogoff, *op cit*). The failure of PPP to account for variations in the real exchange rate has been reported by many other studies using formal statistical tests that failed to reject the null hypothesis of a unit root in the real exchange rate against the alternative of a stationary stochastic process. If the unit root model can characterise real exchange rate behavior, then PPP does not hold because there is no propensity to revert back to any equilibrium level (Cashin *et. al*, 2003). The failure to validate the PPP condition means that empirical models may have to be appropriately redesigned to incorporate other sources of permanent shocks attributed to various economic fundamentals for the determination of the real exchange rate.

Whereas the PPP condition constitutes one of the fundamental but testable theoretical benchmarks against a set of other financial market conditions such as interest rate differentials that become important in a world of dynamic cross border capital flows in the determination of near term exchange rate adjustments, the issue of evaluating the fundamental equilibrium exchange rate must

nonetheless necessarily contend with the working of the fundamental economic factors such as supply, demand and nominal factors which govern the eventual outcomes (deficits/surplus) of the external account of any country. Furthermore, while day to day movements in the nominal exchange rate may be influenced sometimes by financial market conditions (such as those determined by relative/ excess rates on return available in alternative markets in managed exchange rate regimes) that may themselves serve as a source of distortion of the real exchange rate against its fundamental equilibrium level; the importance of finding the equilibrium nonetheless remains at the heart of exchange rate management policy aimed at mitigating the adverse effects of disequilibrium in the exchange rate market in the long term.

The subject matter is also contextual in terms of the recommendations made by the Committee on Fuller Capital Account Convertibility (Chairman: S.S Tarapore) emphasizing on the need to undertake a periodic review of the "neutral" (or equilibrium) REER which could be changed as warranted by fundamentals. The emphasis on the importance of economic fundamentals in the determination of the equilibrium real exchange rate has been fully recognised although much of the discussion in the Indian context has so far been based on *adhoc* generalisations not supported by empirical judgment. This paper, therefore, attempts to fill this void in the empirical work relating to the determination of the fundamental real equilibrium exchange rate in India.

This research, as alluded to above, is focused on the task of evaluating the applicability of PPP in the Indian context, while also positing a broader framework incorporating fundamental economic factors to estimate the equilibrium real exchange rate and to identify factors that could have determined its movements lately during the post reforms years. The empirical method employed here owes to the seminal work of Blanchard and Quah(1989) which offers a methodology for distinguishing temporary and permanent shocks based on a unique characterization of structural VAR. The B-Q estimation procedure can be used to estimate the equilibrium real

exchange rate as also the extent of misalignment of the actual real exchange rate in relation to its equilibrium value. Although the VAR methodology permits a number of analytical insights, the main objective of the present effort is aimed at estimation of the real equilibrium exchange rate to serve as one of the several helpful tools for the purpose of exchange rate management. Furthermore, with a view to supporting appropriate inference making, estimates of forecast error variance decompositions have also been obtained to elicit the components accounted for by innovations in the forecast error variance of individual economic variables specified in the model. The paper is schematised in four Sections. Section I contains a brief survey of literature pertaining to exchange rate determination relevant to the subject. Section II explains the data employed in the study and Section III describes the empirical methodology. Section IV offers the estimate of the real equilibrium exchange rate and other associated empirical evidence for India and, finally, Section V offers concluding observations.

Section I
Review of Literature

The review of literature in the context of the developing countries is related by and large to the empirical body of research devoted to testing the applicability or otherwise of the PPP concept for exchange rate determination. In regard to the conclusions reached by numerous analytical papers related to developing countries, the consensus on PPP is hardly fully supported given the weight of technical shortcomings such as low power of univariate unit root tests highlighted by more recent studies on the subject. Besides even in the case of developed countries where the PPP condition has been validated on the basis of long time series samples or panels of data, evidence in favor of the PPP condition has been acceded only in the case of traded goods. Needless to mention, comprehensive research on the subject, especially, in the case of developing countries is rather scarce, and many studies are limited in their focus on traditional testing of the PPP condition for exchange rate determination(Annexure I). As

alluded to above, because *ex hypothesi* the PPP seeks merely to address the limited question whether or not relative prices determine relative exchange rate positions, it leaves aside the more engrossing issue of identifying fundamental economic factors that could be incorporated in the overall theoretical framework for proper characterization and explanation of exchange rates. The latter approach for determining exchange rate parities is of relatively recent origin and with limited empirical evidence in the context of developing countries.

As mentioned above, in the recent years efforts has been made to incorporate information on real fundamental economic factors for estimating the long-run exchange rate equilibrium and, in that context, suitable measures of misalignment of the actual exchange rate with the equilibrium exchange rate. In fact, the origin of this approach is traced to the large body of the work which emphasized the importance of real shocks in the determination of the underlying the real equilibrium exchange rate. The idea that productivity shocks may affect the equilibrium real exchange rate (Harod-Balassa-Samuelson(HBS) effect) has left an impressive imprint on the history of economic thought, even though evidence based on early empirical work on the subject is somewhat indeterminate. In the more recent work especially, in Taylor and Taylor (2004), the possibility of time varying HBS effect has been tested by allowing for linear and non linear deterministic trends as there may be a tendency for the real equilibrium exchange to shift over time due to inter-temporal variations in relative productivity differentials. The inclusion of linear or non linear deterministic trends offer substantial support in resolving the puzzles about how fast the exchange rate reverts to its mean level. Using data since 1820 for the US, the UK and France, and a nonlinear framework, Lothian and Taylor (2006) found statistically significant HBS effect for sterling-dollar real exchange rate.

The estimation of the fundamental equilibrium exchange rate has been an issue of ongoing interest and a number approaches and explanatory variables have been considered in modeling frameworks. An assortment of relevant macroeconomic and financial indicators, for example, are explicitly included in the behavioral equilibrium exchange

rate (BEER) approach which takes into account factors such as productivity, real interest rate differentials (the interest parity condition), government expenditures and net forex assets in determining the equilibrium exchange rate.

The fundamental equilibrium exchange rate (FEER) of Williamson (1983,1994) is yet another approach that takes into account variables such as unemployment and inflation as determinants of equilibrium exchange rate. On the other hand, in studies particularly in the context of EU member states in transition, the exchange rate misalignment has been evaluated taking into account, *inter alia*, factors such as changes in the quality of goods and services and dismantling of administered price controls.

In another intuitive empirical inquiry, the real exchange rate is determined using fundamental macroeconomic relationships/factors. For example, Vlaar (2002) estimated a portfolio balance model that incorporated an output gap equation, a Phillips curve, a Taylor rule and an equation for the balance of payments. Bjornland (2004) estimated a measure of real equilibrium exchange rate and identified the extent of misalignment of the real exchange rate in Venezuela using a structural VAR between the period 1985 and 1999. Including four structural shocks namely real demand, supply, nominal and oil prices shocks in the model consistent with open economy assumptions of economic fluctuations, the empirical results rejected the PPP hypothesis and instead underscored the relative importance of the permanent real demand shocks in determining the real exchange rate. Bjornland's (*op.cit*) research is distinguished in its approach because of its attempt to identify the significance of the key building blocks/fundamentals of the basic macroeconomic foundation relevant for the determination of the real exchange rate while not merely limiting the objective to the testing the PPP condition.

Ozlale and Yeldan (2002) developed a state space model to estimate the equilibrium exchange rate using exchange rate volatility, short term capital movements, industrial production, inflation, budget balance of public sector, openness and lags of explanatory variables. In efforts made since the mid-1990s, many studies have also been

employing micro founded general equilibrium open economy models for the determination of real exchange rate, although empirical usefulness of these types of models is yet to be fully established given parameter approximations and uncertainties, *viz.*, associated standard errors and the lack of accountability of the structure of stochastic shocks.

Mohsin Khan (2004) investigated the applicability of the Balassa-Samuelson effect on the long-run behavior of real exchange rates in developing countries based on a panel data sample of 16 developing countries. The empirical evidence obtained underscored the significance of the traded-nontraded productivity differential in determining the relative price of nontraded goods, and hence the relative price ratio which in turn exerted a significant effect on the real exchange rate thereby providing a robust verification of Balassa-Samuelson effects for developing countries.

Using fundamental determinants of terms of trade, openness of the economy, relative productivity differentials between home and trading partners, share of investment in total consumption and trade balance, Omerbegovic (2005) developed a cointegrating model for the determinants of the real exchange rate for Bosnia and Herzgovnia.

As far as research in India is concerned, the study by Kohli (2002) appears somewhat broad based than earlier works which were primarily limited to the testing of PPP. Using unit root and cointegration tests, Kohli (2002) found mean reverting tendencies in the real exchange rate series for India constructed using the consumer price index as the deflator, as well as for series constructed using ratio of wholesale and consumer price indices thereby suggesting that monetary policy impulses were the main cause of disturbance in real exchange rate. On the other hand, the evidence of non stationarity of the relative differential of tradable and non tradable goods suggested that real shocks such as permanent changes in productivity or government spending were important for the determination of the real exchange rate movements. The findings are based on statistical data generating properties but do not either explicitly account for or identify various underlying factors contributing to the movements in the real exchange rate series.

The computation of real equilibrium exchange rate is an important feature of the advanced empirical effort undertaken in the recent years. Various approaches for the determination of the equilibrium exchange rate are based on the different types of underlying hypotheses - but all nonetheless in the search of that important model of equilibrium exchange rate determination in different country settings.

Section II
Selection of System Variables

The quarterly data for India and industrial countries for the period 1996:Q1 to 2005:Q4 was collected from IMF's International Financial Statistics(IFS) database. The IFS data base is distinguished by its presentation of different data series/indices with a common base year which helps in making appropriate cross country comparisons. In particular, data series retrieved from IFS database include indices of industrial production and consumer price indices. Data on 36 country bilateral trade weighted real exchange rate (REER, base 1993-94) was taken from various issues of the RBI Bulletin. The data have been transformed into the following system variables for the structural VAR : (i) annual rate of change of 36 country trade weighted REER(base 1993-94=100), (ii) annual growth in the relative indices of industrial production of India and that of industrial countries(composite, 2000=100), (iii) annual growth in the wholesale Price Index (WPI) of India relative to that of the Consumer Price Index (CPI) of industrial countries(composite, 2000=100) and (iv) relative rates of inflation in China and India. The choice of index of industrial production of industrial countries and that of India is taken as representing a relative supply variable as both imports and exports comprise predominantly of both intermediate and final industrial goods that serve to determine a significant portion of trade and thereby have implications for the real exchange rate. Besides, since factor productivities also constitute a part of the overall growth in output, the relative supply variable helps in capturing the impact of HBS effect which avers that the exchange rate of countries with higher

relative productivity tends to appreciate. The relevance of industrial production in industrial countries in relation to the real exchange rate also arises from the fact that the growth and volatility of the output in these countries affects the output of other countries including those of the emerging market economies because of their growing trade and investment relationship with the rest of the world. The nominal shocks in the model are taken as relative inflation indices in India and industrialised countries since inflation differentials (PPP) impact the real exchange rate notwithstanding the presence of market rigidities which slow down adjustments in nominal wages. Finally, the impact of real demand effect on the real exchange rate is captured by factors that generate demand such as money supply and/or fiscal deficit. Notably, all the three factors included in the model that serve as explanatory variables are essential for any meaningful characterization of an economic framework.

Section III
Empirical Methodology

The interpretation of the structural VAR is made in terms of four shocks, namely, real demand(ε_{sup}), supply(ε_{rdem}) and nominal(ε_{nom}) shocks related to system equations for changes in REER, relative industrial output and relative nominal prices. The algebraic form of the VAR model is presented below.

Including stationary variables in the structural VAR, and ordering the vector as z_t = (Δsup, Δrd, Δnom), the model is as follows

$$\Phi(L)z_t = e_t$$

pre-multiplying by its inverse

$$[\Phi(L)^{-1}]\ \Phi(L)\ z_t = [\Phi(L)^{-1}]e_t$$

Let $\Phi(L)^{-1} = K(L)$, then we have

$$[I_n - \Phi(L)L - \ldots.\Phi(L)_pL_p][I_n + K1(L) + \ldots.] = I_n$$

$$z_t = K(L)e_t \qquad (1)$$

where K(L) has finite order and where e_t is the vector of reduced form independent white noise errors corresponding to the individual equations in the structural VAR with a covariance matrix Ω. Assuming that the orthogonal structural shocks (ε_t below) can be written as linear combinations of the structural errors (1) esp., $e_t = R^o \varepsilon_t$ where R^o is a non singular matrix. The moving average (MA) form of system (1) containing the original residuals then can be written in terms of the orthogonal disturbances with each of the ε_t normalized to have unit variance.

$$z_t = R(L)\, \varepsilon_t \qquad (2)$$

where $K(L)R^o = R(L)$ and for positive definite matrix $\Omega = R^o R^{o\prime}$. Equation (2) forms the basis for obtaining Blanchard and Quah decomposition. In particular if R^o is identified then the MA representation can be directly derived from (2). However, since R^o is a three by three matrix, appropriate restrictions are required for identification. Since $\Omega = R^o R^{o\prime}$ and var(ε_t) are normalized to unit variance, matrix R^o requires only three additional restrictions for identification which can be obtained by imposing restrictions on the long run multipliers in the matrix R(L). Each component of the matrix R(L) namely $R_{ij}(1)$ represents the corresponding dynamic long run multiplier which would be need to be subjected to economically meaningful restrictions for identification.

Following Bjornland (2004), the following restrictions needed for the identification of R(L) matrix consistent with the standard open economy assumptions are placed on the long run multipliers to identify the three structural shocks namely real demand, supply and nominal shocks.

(a) There is no long run effect of nominal shocks on the real exchange rate. The short run restriction on nominal shocks is consistent with the most open economy models of short run variability in the exchange rate. This implies that

$$R_{23}(1)=0$$

(b) There is no long run effect of real demand and nominal shocks on supply viz.,

$$R_{12}(1) = R_{13}(1) = 0$$

the restriction that long run real demand shock does not affect supply is according to the widely received wisdom in macroeconomic literature.

(c) Real demand shocks can have a long run effect on itself and can be impacted by supply shocks and as above there is no impact of nominal shocks.

(c) finally, nominal shocks are influenced both by long run real demand and supply shocks.

with these restrictions, it is straightforward to recover R^o as both K(1) and Ω are known. As R(1) is lower triangular, it is also lends itself to Choleski factorization of the long run representation $R(1)\Omega R(1)$.

Forecast error variance decompositions have also been obtained alongside a measure of the real equilibrium exchange rate which is presented in a graph. Measure of misalignment is computed by comparing the actual real exchange rate with the estimated trajectory for the equilibrium real exchange rate obtained from the model.

Section IV
The Empirical Estimate of the Fundamental Real Equilibrium Exchange Rate

As mentioned in Section III since R^o is identified, the MA representation derived there from offers a practical approach for computing the estimate for the equilibrium real exchange rate. However, before the said estimate is obtained, it would be useful to take a look at the forecast error variance decomposition of the real exchange rate variable. The Table below presents the average components, for a forecast horizon of 12 quarters, accounted for by innovations in the individual variables in the forecast error variance or MSE of the real exchange rate variable.

Table 1 : Forecast Error Variance Decomposition of Real Exchange Rate (per cent)

Accounted for by Real Demand factor	Accounted for by Supply factor	Accounted for by Nominal factor
63.12	7.29	30.57

From the results presented in Table 1 on the decomposition of forecast error variance it is obvious that for a country like India with a diversified economic structure, the real exchange rate is determined by a combination of stochastic shocks pertaining to real demand, supply and nominal factors. Notably, the permanent real demand shock accounts for the bulk of explanation (63 percent) followed by nominal and supply shocks. The innovations in the permanent nominal shocks and supply shocks explain about 30 percent and 7.0 percent of the forecast error variance of real exchange rate, respectively. The contributions made by different shocks are expected to change depending on the changing weights of constituent shocks over time and the time sample taken for the empirical analysis. It may be mentioned that the contribution of constituent shocks towards the explanation of the forecast error variance of effective real exchange rate remains by and large unchanged even if the model is augmented with relative price ratio of China and India as an additional explanatory variable.

For the present context, given the fact that factors other than nominal shocks alone are responsible for the determination of the real exchange rate, the multiple indicator approach for conducting monetary/exchange rate policies therefore appears to be an ideal strategy to follow for ensuring long term stabilization of the external account. It may be recalled that from 1950 to 1980, when the Indian economy was growing at a relatively slower speed of 3.6 percent, domestic investment exceeded domestic savings by only a small fraction. During this period, the gap was easily met by foreign borrowing. However, later during the period 1980 to 1990, when the growth rate of GDP accelerated to 5.8 percent, the wedge between savings and investment widened considerably, requiring large foreign

borrowings for capital expenditures on imports of machinery and raw materials, including oil to give a fillip to the increase in aggregate demand. As a consequence, the gross foreign debt shot up from US $ 22.6 billion in 1980 to US $ 83.80 billion in 1991. At the same time the reduction in internal savings rate was accounted mainly by expanding fiscal deficit of the government which rose from an average of 7.72 percent of GDP during the Seventh Five-Year Plan to 7.85 percent by 1990-91. Large fiscal deficits were caused by a number of reasons namely exorbitant expenditures on subsidies of fertilizers, food, exports, power, transport and irrigation. Apart from the current account deficit, mounting capital expenditures by the government and public enterprises were financed through public borrowing. By 1990, internal debt liabilities increased to 49.8 percent of GDP compared with 33.7 percent in 1980. In addition to the aforementioned factors, the sharp rise in import prices of oil and the downgrading of India's credit rating, led to a loss of confidence resulting into drying up of short-term credit and foreign borrowings besides an outflow of non-resident Indian deposits led to the crisis of 1991. Clearly as the experience of the nineties shows, the balance of payments of crisis was caused by a mix of factors esp., high demand and supply mismatches coupled with exogenous oil price shocks that eventually culminated in the institution of a wide ranging macroeconomic, structural and stabilization program encompassing monetary and financial sectors and public finance, trade, industry, foreign investment and exchange rate. The exchange rate regime was itself made increasingly more flexible over time to accommodate appropriate adjustments in keeping with the forces of demand and supply.

As the stability of the real exchange rate hinges on factors indicated above, policies aimed at addressing relevant issues in these areas would serve to foster stability in the external sector. On the demand side, for example, the need for fiscal rectitude and appropriate money supply to enable sustainable growth in a climate of stable inflationary expectations may be considered as ongoing priorities to limit the spillovers from macroeconomic imbalances to the external deficit. On the supply side, facilitating infrastructure

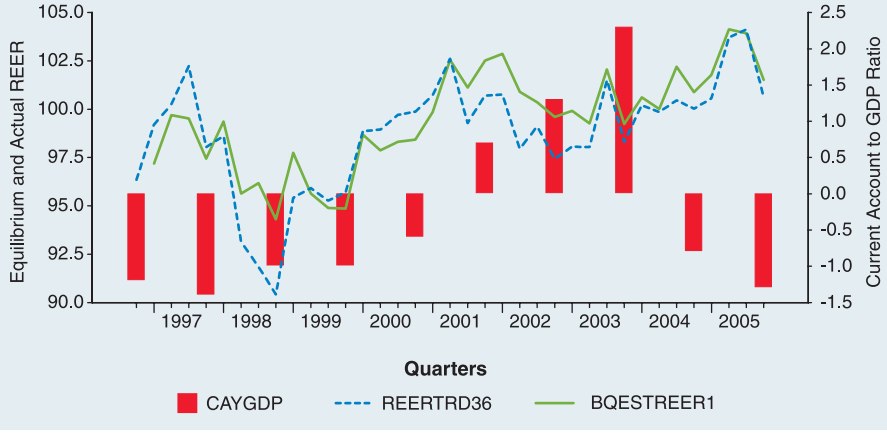
development and improving incentives to encourage increased resource investment, capacity creation and technological absorption in supply constrained sectors may play a key role.

Having captured the contributions of the factors causing the real exchange rate, the real equilibrium exchange rate calculated using real demand shocks(added to the drift) from the MA representation of the VAR is plotted along with the actual real exchange rate.

The comparative positions of the actual REER (REERTRD36 in Chart 1) and equilibrium REER (BQESTREER1 in Graph I) plotted against the current account to GDP (CAYGDP) on the right scale indicate some form of empirical regularity. During the sample period taken for consideration, the actual REER remained above (overvalued) the equilibrium REER until early 1998 where after it was seen as clearly undervalued (except for a few quarters in between 2000 and the first half of 2001) in comparison with the equilibrium REER till early 2003 and then yet again shifted upwards embracing its fundamental level quite closely. From the perspective of the present analysis, the changing magnitudes of the current account to GDP ratio posited against the degree of alignment of the real exchange rate with the corresponding equilibrium (determined by fundamentals) offer some insight into the dynamics of the external account in India.

Chart 1: Equilibrium REER *vs* Actual REER and Current Account to GDP ratio

Current account to GDP ratio on right scale



Illustratively, when the actual REER was perched higher (overvalued) than the equilibrium REER, the current account to GDP ratio was negative between 1996 and 1998 but gradually started improving from 2001 onwards as the actual REER gradually moved below its fundamental equilibrium path until early 2003. Subsequently, as the actual REER increased and began following its fundamental level, this period saw the gradual emergence of current account deficits. While these episodes underline the need for continuous monitoring of the evolution of the fundamental equilibrium REER for managing current account balance, the desirability of having a predefined band around the neutral REER as suggested by Committee on Fuller Capital Account Convertibility (FCAC) also may need to be positively deliberated. There is clearly a need to keep the actual REER anchored closely to its fundamental level which may, perhaps, be relaxed in cases of implied tradeoffs in tandem with the contextual revision in the hierarchy of goals of economic policy and particularly in the face of temporary asymmetric risks to economic outlook.

It may be mentioned that the importance of fundamentals in the context of exchange rate management has been emphasized on many occasions at the policy making level. Dr. Y.V Reddy, in his inaugural address to the XIth National Assembly of Forex Association of India in 1997 underscored that “any currency could come under speculative attack if its exchange rate is out of alignment with fundamentals for a prolonged period of time”. Dr. C. Rangarajan (Chairman, Prime Minister’s Economic Advisory Council) recently noted that “ when and economy becomes more open to capital and financial flows, there is even greater compulsion to ensure that factors relating to macroeconomic stability are not ignored”. Needless to state, the literature on exchange rate management has also been emphasizing the fact that a prolonged deviation of REER from the equilibrium REER in terms of overvaluation could lead to worsening of trade balance, speculative attacks, increased foreign debt, fall in the rate of investment, productivity and thereby overall growth (Gylfason, 2002).

Besides the structural and stabilization program instituted during the nineties, the success in limiting the misalignment of the exchange rate is also significantly attributed to the broad framework of reforms in the external sector in the aftermath of the Gulf crisis which were based on the recommendations of the High Level Committee on Balance of Payment (Chairman: Dr C. Rangarajan, 1991). The Committee advocated compositional shift in capital flows, liberalization of the current account along with introduction of market determined exchange rate regime and emphasized on the need to contain the current account deficit within prudential limits. Needless to mention, the emphasis on containing the current account deficit at prudential levels typically underscored the importance of the impact of aggregate demand effects on the real exchange rate. The implementation of the recommendations of the High Level Committee resulted in market determined exchange rate regime effective March 1, 1993 and thereafter the acceptance of Article VIII of the Articles of Agreement of the IMF in August 1994 brought on full current account convertibility paving way for orderly exchange rate movements in accordance with evolving demand and supply conditions in the foreign exchange market, thereby limiting the extent of exchange rate misalignment The virtues of a flexible exchange rate system are well recognized. Compared to a fixed exchange rate, a flexible exchange rate arrangement, under normal circumstances, leads to quicker convergence towards the equilibrium because of faster self-stabilizing adjustments in the nominal exchange rate in tandem with the changes in fundamentals as compared with slower convergence through changes in relative price ratios which remain sticky because of market rigidities.

Section V
Concluding Observations

Although there are many empirical approaches devoted to the subject, this paper has employed an empirical approach involving economic fundamentals for estimating the equilibrium real exchange rate for India. The assessment of the fundamental equilibrium level

at periodic intervals and its relationship with the actual level of REER can provide useful information and may serve as one of the helpful tools for exchange rate management. According to the empirical illustration, and for the time period under consideration, the real exchange rate in India is found to be predominantly determined by permanent real demand shocks followed by nominal and supply shocks. The upshot of these findings is that the efforts undertaken by the Reserve Bank in sterilizing capital inflows to offset demand pressures would continue to play the pivotal role in exchange rate management policy. On the other hand, the relative PPP condition alone may not be sufficiently significant in judging under or overvaluation of the exchange rate. The dynamically shifting position of the fundamental equilibrium REER in response to evolving fundamentals also implies that it would not be entirely inappropriate to suggest that nominal exchange rate interventions may not be based on any arbitrary "rule of thumb" without appropriate recognition of the contributions made by shocks pertaining to different economic fundamentals. The contribution made by each of the different factors incorporated in the model is subject to change depending on the evolving strength of shocks over time thus requiring continuous monitoring.

For the time sample taken in the study, the empirical regularity, *viz.*, the apparent relationship of the divergences between the actual and fundamental REER and the corresponding developments in the current account ratio underpin the importance of periodically tracking the model based fundamental level of REER. Needless to mention, there is further scope for developing more proximate policy oriented models which can offer policy rules under fast changing conditions in the macroeconomic environment. The flexibility of the real exchange rate is primarily a product of the far reaching reforms in the policies and practices related to exchange rate management during the 1990s, as also due to the remarkable changes in the framework and operating procedures of monetary policy and the general improvement in the macroeconomic environment. From the policy point of view, considering the fact that a variety of factors(viz.,

multiple fundamental indicators) serve to determine the real exchange rate in the Indian context, initiatives aimed at prudent management of demand (*viz.,* fiscal deficits and money supply from the policy perspective) and supply (investments, productivity and technological progress to alleviate supply constraints) coupled with stable inflationary expectations should serve to maintain the stability of the external account on an enduring basis.

Finally, as has been the experience in foreign exchange management in the post reforms year, the policy of maintaining flexibility of the exchange rate in keeping with evolving market forces of demand and supply without undue volatility as adopted by the Reserve Bank has stood the test of time in sustaining the stability of the external account. Needless to mention, the judicious exchange rate management policy of the Reserve Bank supported with sterilisation interventions in the face of heavy capital inflows in the recent years also considerably served to ease the bias in current account besides limiting undue volatility in the exchange rate which is critical for maintaining financial stability.

References :

Balassa,B.(1964), 'The Purchasing Power Doctrine : A Reappraisal', *Journal of Political Economy*, 72, 584-596.

Blanchard, O. and D. Quah. (1989), ' The Dynamic Effects of Aggregate Demand and Supply Disturbances', *American Economic Review* 79, 655-673

Bleaney,M, Leybourne S.J and Mizen P.(1999), 'Mean Reversion of Real Exchange Rates in High Inflation Countries', *Discussion Paper No 99/13*, University of Nottingham.

Bjornland.H.C. (2000), ' The Dynamic Effects of Aggregate Demand, Supply and Oil Price Shocks- A Comparative Study', *The Manchester School of Economics Studies*, 68, 578-607.

Bjornland.H.C. (2004), 'Estimating the Equilibrium Real Exchange Rate in Venezuela', *Economics Bulletin*, Vol 6, pp 1-8.

Cashin, P and C.John McDermott.(2003), ' An Unbiased Appraisal of Purchasing Power Parity', *IMF Staff Papers*, Vol 50.

Froot.K and K.Rogoff.(1995), 'Perspectives on Purchasing Power Parity and Long Run Real Exchange Rate', in G.Grossman and K.Rogoff (eds) Handbook of International Economics, Vol 3, Eslevier/North Holland.

Gylfason T.(2002), ' The Real Exchange Rate always Floats', *CEPR Discussion Papers*, No 3376, Center for Economic Policy Research.

International Monetary Fund, '*International Financial Statistics*', March 2005, IMF Washington.

Holmes M.J(2001), 'Principal Components, Stationarity, and New Evidence of Purchasing Power Parity in Developing Countries', *The Developing Economies*, XXXIX-2, June 2001, pp 189-98.

Holmes M.J. (2002), 'Are there non-linearities in US:Latin American real exchange behaviour', *Estudio de Economica*, Vol 29-N, December 2002, pp 177-190.

Kohli R. (2002), 'Real Exchange Rate Stationarity in Managed Floats: Evidence from India ', Working Paper No 93, ICRIER, New Delhi.

Liu,P.C.(1992),'Purchasing Power Parity in Latin America : A Cointegration Analysis', *Weltwirtschaftliches Archiv* , 128, pp 662-80.

Lothian J.R and Taylor, M.P.(2006), ' Real Exchange Rates Over the Past Two Centuries : How Important is the Harrod-Balassa- Samuelson Effect ?', *Warwick Economic Research Papers*, No 768, University of Warwick.

Mahdavi S. and S.Zhou. (1994), 'Purchasing Power Parity in High Inflation Countries : Further Evidence', *Journal of Macroeconomics*, No. 16, 403-22.

McNown, R and M.Wallace.(1989), 'National Price Levels, Purchasing Power Parity , and Cointegration : A Test for Four High Inflation Countries' *Journal of International Money and Finance*, No. 8, pp533-45.

Mohsin Khan.(2004), ' Real Exchange Rate in Developing Countries : Are Balassa- Samuelson Effects Present ?' IMF Working Paper No 04/188, IMF Washington.

Omerbegovic. A.(2005), ' Real Exchange Rate in Bosnia and Herzgovnia, the Required Adjustment in the Context of Macroeconomic Stability and Accession to the EU", Sarajevo School pf Business, Sarajevo.

Paul Mohua.(2002), 'Empirical Evidence of Purchasing Power Parity in six South East Asian Countries - A Panel Data Approach', mimeo, Institute of Economic Growth, University of Delhi.

Rangarajan, C.(2007), " Who's is afraid of globalization ?", *The Economic Times*, Monday 15 January, 2007.

Reddy, Y.V.(1997), 'Exchange Rate Management : Dilemmas', *Inaugural Address* at the XIth National Assembly of Forex Association of India, Goa.

Reserve Bank of India, "Report of the Committee on Fuller Capital Account Convertibility(FCAC)", Chairman : S.S Tarapore, July 2006..

Reserve Bank of India , *Reserve Bank of India Bulletin*, various issues.

Rogoff, K.(1996), 'The Purchasing Power Parity Puzzle', *Journal of Economic Literature*, 34, 647-68.

Samuelson, P.A.(1964), ' Theoretical Notes on Trade Problems', *Review of Economics and Statistics*, 46,145-154.

Schweigert, T.E.(2002), 'Nominal and Real Exchange Rates and Purchasing Power Parity during the Guatemalan Float, 1897-1922', *Journal of Economic Development*, Vol 27, Number 2, December.

Simmons Walter. (2005), 'Purchasing Power Parity in the East Caribbean Currency Union', *The Journal of Developing Areas*, Vol 38, Number 2, Spring 2005, pp 155-169.

Taylor, A. M and Mark P. Taylor.(2004), " The Purchasing Power Debate", *Journal of Economic Perspectives*, 18:1, 135-158

Williamson, J.(1983), 'The Exchange Rate System', *Institute for International Economics*, Washington

Williamson, J.(1994), 'Estimating Equilibrium Exchange Rates', ed. *Institute for International Economics*, Washington.

Vlaar, P.(2002), ' On the Strength of US dollar : Can it be explained by output growth ?', *DNB Staff Reports* , 82 Netherlands Bank.

Annex I

PPP testing in Developing Countries : A Review

(i) Bleany *et.al* (1999) investigated the applicability of PPP for a sample of high inflation countries esp., Argentina, Brazil, Chile and Israel for the period 1972 to 1993, noting that while in the literature there was particularly striking evidence that the estimated coefficients of cointegrating regressions between exchange rates and relative prices were much closer to PPP predicted value of unity, the alternative empirical evidence obtained by using advanced stochastic unit root models did not support the assumption of a fixed rate of mean reversion of exchange rates, especially under extreme and rapidly changing monetary conditions.

(ii) Nagayasu (1999) studied the long–run purchasing power parity (PPP) concept empirically using the parallel market exchange rates of 17 African countries and using the panel cointegration method. The panel data method was employed to overcome the problem of not having long time–series for African countries. Empirical evidence adduced in the paper supported the weak–form of the long–run PPP hypothesis in Africa, not requiring a homogeneity restriction on prices.

(iii) Wikremsinghe (2001) investigated the applicability of PPP for Sri Lanka using data for the period for the floating exchange rate regime. Using symmetric unit root tests which took into account unknown means and trend and graphical techniques, the empirical evidence overwhelmingly rejected the PPP hypothesis for Sri Lanka. The failure of the symmetric unit root test and therefore of PPP hypothesis pointed towards the existence of market frictions such as transaction costs prevailing in international trade.

(iv) Mohua Paul (2002) tested the validity of PPP hypothesis for six South East Asian countries, including India, employing panel unit root test for multilateral real effective exchange rate based

on dynamic export, import and trade weights. The empirical evidence supported the alternative hypothesis of acceptance of the PPP hypothesis for demeaned data, thus concluding that PPP could be used to assess the levels of exchange rate.

(v) Holmes (2001) conducted test for PPP for a sample of 30 developing countries using a technique that investigates the stationarity of the largest principal component based on deviations from relative PPP against the United States. Using data for the period 1973 to 1997 the empirical results generally confirmed PPP and made out, unlike other studies, that there was no evidence that PPP is confined merely to high-inflation countries as established, *inter-alia*, by McNown and Wallace (1989), Liu (1992) and Mahdavi and Zhou (1994).

(vi) Holmes(2002) tested non-linearities in US $/Latin American real exchange rates and found that non-linearities existed for seven out of thirteen countries in the sample with Columbia and Venezuela showing the sharpest transition between regimes of low and high real exchange rates. Noting that while the vast majority of the work on PPP was based on linear tests for mean reversion of real exchange rate, the authors conclude that the identification of non-linearities should offer some explanation as to why PPP was not confirmed in many cases. In a more recent study Holmes and Wang (2004) investigated the possibility whether the long run purchasing power parity in less developed and developing countries was dependent upon the nature of shocks experienced by them. Using non linear tests of stationarity and cointegration and a sample of ten African economies for the post Bretton Woods era, they found that long run purchasing power held in eight out of ten countries chosen for the sample if an explicit distinction were made between positive and negative shocks.

(vii) Simmons (2005) studied the applicability of PPP hypothesis for Eastern Caribbean Currency Union and found that PPP held for each exchange rate and many real exchange rates are cointegrated and moved in a block in the Eastern Caribbean

region over the 1980s and 1990s. The relationship of the nominal and real exchange rate and purchasing power parity of the Guatemalan peso was investigated by Schweigert (2002) who concluded that the nominal exchange rate was consistent with the PPP hypothesis, and the behaviour of the real exchange rate was consistent with fundamentals. The paper also concludes that improvement of terms of trade and years of good harvest coincided with appreciation while reversal of capital flows led to depreciation.

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Non Deliverable Foreign Exchange Forward Market: An Overview

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Recognising the growing activity in the non deliverable forward (NDF) market in the recent years, the paper attempts to present a detailed analysis of the NDF market with special focus on Indian rupee. An attempt is made to study the interlinkages among the spot, forward and NDF markets for Indian rupee. Using daily exchange rate data from Reuters database for the period November 2004 to February 2007, and applying Granger causality test and augmented GARCH formulation, the study finds that the NDF market is generally influenced by spot and forward markets and the volatility spillover effect exists from spot and forward markets to NDF market. Evidences are also observed for volatility spillover in the reverse direction, *i.e.*, from NDF to spot market, though the extent is marginal. Furthermore, using the covered interest parity formulation, the study has found that the spread between the onshore and offshore implied yield is positive, thus, providing evidence towards appreciation pressures operating on rupee in the domestic market. Hence, the study has suggested for close monitoring of NDF market.

JEL Classification : G13, F31, G12

Keywords : Non deliverable forward, volatility, implied yield

Introduction

The Indian foreign exchange market has seen a massive transformation over the past decade. From a closed and heavily controlled setting of the 1970s and 1980s, it has moved to a more open and market-oriented regime during the 1990s. Turnover has increased in both the spot and forward segments of the market. A

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recent feature has been the growing trading of the Indian rupee in the non-deliverable forward (NDF) foreign exchange market.

The NDF markets have generally evolved for currencies with foreign exchange convertibility restrictions, particularly in the emerging Asian economies, *viz.*, Taiwan, Korea, Indonesia, India, China, Philippines, *etc.*, With controls imposed by local financial regulators and consequently the non-existence of a natural forward market for non-domestic players, private companies and investors investing in these economies look for alternative avenues to hedge their exposure to such currencies. In this context, non deliverable forwards have become popular derivative instruments catering to the offshore investors' demand for hedging. NDFs are types of derivatives for trading in non-convertible or restricted currencies without delivery of the underlying currency.

Trading in the NDF market generally takes place in offshore centres. In this market, no exchange takes place of the two currencies' principal sums; the only cash flow is the movement of the difference between the NDF rate and the prevailing spot market rate and this amount is settled on the settlement date in a convertible currency, generally in US dollars, in an offshore financial centre. The other currency, usually an emerging market currency with capital controls, is non-deliverable. In this particular respect, of course, NDFs are similar to commodities futures market where commodities, like wheat or corn, are traded in organized futures markets and positions are later settled in dollars, wheat or corn being non-deliverable. The NDF prices are generally determined by the perceived probability of changes in foreign exchange regime, speculative positioning, conditions in local onshore interest rate markets, the relationship between the offshore and onshore currency forward markets and central bank policies.

Being offshore, the market has remained outside the regulatory purview of the local monetary authorities. Yet, considering the linkages that prevail between the onshore spot and forward markets and the offshore NDF market, activity in these markets has always been of interest to the regulators. However, studies on NDF markets are rather limited and in India, this aspect has remained unexplored.

Against this backdrop, the paper attempts to explore the various facets of the NDF market in the Asian region, with particular focus on the transactions in Indian rupee in the NDF markets. Section I traces the evolution of NDF markets in the Asian region. A review of the extent of activity in the Asian NDFs, at present, is attempted in Section II. Section III then, provides a detailed overview of the current NDF market structure for Indian rupee. It undertakes an assessment of the available market infrastructure in terms of market players, market regulation, settlement period, trading platform and the offshore centers for INR-USD NDFs. An assessment of the market activity in terms of market turnover, volatility and bid-offer spreads are also part of this section. Section IV tries to explore the linkages in terms of information flows between the offshore rupee NDF and the onshore markets. Empirical exercises have also been attempted to examine (1) the causality that exists between the two markets, (2) the volatility spillover that takes place between the two markets and (3) the extent of market segmentation between onshore and offshore interest rates implied by the NDFs. Section V dwells upon the policy implications of the analysis. Section VI then lists out the concluding observations along with the outlook for the future.

Section I

Evolution of NDF markets

Capital flow to emerging market economies (EMEs), particularly Asia, rose significantly during the 1980s and 1990s. During this period, however, while in some EMEs domestic forward markets were not developed, others were characterized by restrictions on non-residents' access to domestic forward market. The objective was clear. Local monetary authorities feared that easy access to onshore local currency loans and deposits, and the ability to easily transfer local currencies to non-residents, encourages speculative financial movements, greater exchange rate volatility, and ultimately some loss of monetary control (Higgins and Humpage, 2005). Consequently, some international banks, starting from the early 1990s, began offering non-deliverable forward contracts to investors to hedge their exposures in EME currencies.

Initially, most NDF trading was in Latin American currencies. Trading volume in NDFs began to increase in 1994 after voice brokers entered the market as intermediaries facilitating interbank trading, which allowed dealers to more easily offset positions with one another that they had accumulated from their market making activities for clients. At that time, Mexican *peso* NDFs had the largest trading volume, reflecting market participant expectations for a devaluation of Mexican *peso* from its then-fixed level against the dollar. As investment flows into emerging economies grew, the NDF market increased and expanded beyond Latin American currencies to Asian and Eastern European currencies. The International Swaps and Derivatives Association (ISDA) added settlement provisions for NDF transactions to its 1997 draft FX and currency option definitions. Interest in NDF trading further increased leading up to the Asian crisis of 1997. Many emerging market countries tightened their restrictions following the financial crises of 1997 and 1998, giving a further impetus to an already developing offshore NDF market.

Today, a large and increasingly active market in NDFs exists for many Latin American, East Asian, and Eastern European currencies, with centers in Hong Kong, Singapore, South Korea, Taiwan, Japan, London (for Eastern European currencies and Asian currencies), and New York (for Latin American currencies). Experience suggests that NDF markets are likely to be most developed for countries with significant cross-border capital movements (both portfolio and/or foreign direct investment) but with some convertibility restrictions operating (Lipscomb, 2005). Conversely, NDF markets in currencies of countries that have allowed increased capital convertibility, to the point where currency hedging is fully available onshore have dissipated and/or disappeared (*e.g.* Australia).

Even today many emerging market economies, including China, Indonesia, South Korea, the Philippines, and Taiwan, restrict foreign access to their currency and onshore money markets, making it very difficult–if not impossible–for foreign firms or international investors to hedge in local forward exchange markets, even when such markets exist. As a part of foreign exchange control, access to onshore forward markets by non-residents is not allowed in China

and Taiwan, whereas the access is allowed, subject to underlying transactions requirement in countries like Indonesia, Korea and Philippines including India (Ma *et al.* 2004).

The Indonesian rupiah NDF is a very recent one that had its birth in early 2001. Before January 2001, *deliverable* rupiah forwards were actively traded offshore, mostly in Singapore, and non-residents enjoyed easy access to rupiah funding. To reduce speculative pressure on the rupiah, rupiah loans and transfers by banks to non-residents and related derivative transactions were prohibited or restricted by Bank Indonesia in January 2001. This effectively limited the offshore deliverability of the rupiah and dried up trading in offshore *deliverable* rupiah forwards. To meet the offshore hedging or speculative demand, an offshore market in rupiah NDFs gradually developed over the following months.

It is interesting to observe that the Malaysian ringgit and Thai baht are not traded actively in the NDF markets despite these countries having capital controls, because of certain policies pursued by them. In the case of Malaysia, an offshore NDF market for Malaysian ringgit could not develop after Malaysia moved to a fixed exchange rate system in September 1998. Besides, in the case of Malaysia, the absence of a reference exchange rate for the settlement of NDF contracts among market players is also another factor contributing towards lack of development of NDF market. Moreover, exchange controls in Malaysia prohibit domestic banks to undertake forward foreign exchange transactions with offshore counterparties. Thus, restricting availability of offshore institutions to hedge their exposure derived from the NDF contracts hinders the development of the market[1]. Similarly in Thailand, the Bank of Thailand (BoT) actively discourages foreign banks from quoting in the NDF market. There is an implied threat that if the foreign banks quoted in the NDF market, their domestic branches would have to face the consequences. By adopting this stance, the BoT makes it difficult for banks to quote in the NDF market. However, it is felt that a more actively traded Thai baht NDF market could emerge in the future in response to the Bank of Thailand measures in the recent past to limit non-resident holdings of Thai baht bank accounts.

Annex 1 gives in detail the current restrictions that operate in the forward exchange market and on the access of onshore forward market by non-residents for select Asian countries.

Section II
Activity in Asian NDFs

Comparable and quality data on NDF turnover is generally limited. The Emerging Markets Traders Association (EMTA) Survey held in early 2003 is the latest available official source. As per the EMTA survey, Asia's NDF turnover accounts for the majority of global NDF turnover. In particular, NDFs in the Korean won, the New Taiwan dollar, the Chinese renminbi, the Indian rupee, the Indonesian rupiah and the Philippine peso amount to more than 60 per cent of the emerging market NDF turnover globally. The major remaining NDF markets are those in Latin American currencies (mainly the Brazilian real and Chilean peso) and the Russian rouble, according to the survey. The Korean won NDF market has been the deepest in Asia as well as globally, with average daily trading volume in excess of US $ 500 million and representing nearly half of the emerging market NDF turnover (Table 1). The reason generally stated is that Korea allows domestic banks to operate in the NDF market and that is one of the reasons why the South Korean won is the most liquid NDF currency.[2] Turnover in the New Taiwan dollar NDF market has been the second most active in Asia. The earlier shallow NDF markets in Asia, *viz.*, Chinese renminbi, Indian rupee, Indonesian rupiah and Philippine peso have deepened significantly over the past few years. Also, for most of the currencies, there is limited liquidity in contracts with a maturity over one year.

NDFs form an important part of overall forward trading in regional currencies. For the six emerging Asian currencies, discussed above, the reported NDF turnover represents some 10-20 per cent of the combined trading volume of the onshore outright forwards, foreign exchange swaps and NDFs. In the case of China, domestic trading of outright forwards being a recent phenomenon and with the lack of an onshore swap market, renminbi NDFs amount to about 90 per cent

Table 1: Average daily NDF turnover in Asia

(in millions of US dollars)

Sources of estimates	**HSBC**	**Deutche Bank**	**EMTA**	**Lehman Brothers**	**Forwards and forex swaps**
	(mid-2003)	(2003-04)	(1st quarter 2003)	(June 2001)	(April 2001)
1	2	3	4	5	6
Chinese renminbi	1,000	50	150	50	55
Indian rupee	100	20-50	38	35	1,628
Indonesian rupiah	100	50	65	50	301
Korean won	500	700-1,000	1,350	500	4,025
Philippine peso	50	20-30	38	35	301
New Taiwan dollar	500	300-500	250	250	922
Asian six total	2,250	1,140-1,680	1,890	920	7,232
As a percentage of April 2001 forwards, Forex swaps and NDFs	25.1	13-19	20.7	11.3	

Source: Ma *et al.* 2004, BIS Quarterly Review.

of the estimated combined turnover of onshore deliverable forwards and offshore NDFs.

The investor base for the Asian NDF markets has broadened significantly over the past few years. The investor base mainly comprises multinational corporations, portfolio investors, hedge funds and proprietary foreign exchange accounts of commercial and investment banks. Both hedging demand and speculative demand are present in Asian NDF markets. In the case of the won and the New Taiwan dollar, portfolio investors and hedge funds seem to be the most important players. In contrast, in the case of renminbi, multinationals associated with large FDI into China and more recently hedge funds associated with greater speculation, play a greater role (Ma *et al.* 2004).

An interface with the financial institutions in conjunction with the Committee on the Global Financial System work group project on foreign direct investment in emerging market financial sectors reveal that as much as 60 to 80 percent of NDF volume is generated by speculative interest, reflecting growing participation from international hedge funds. Major financial institutions are generally

involved in NDF markets through their market-making activities. These market-making activities are a service to their customers for which the firm is compensated by a bid/ask spread as well as effective management of the firm's NDF book. Currently, major international banks primarily offset NDF positions incurred through market-making activities with other major banks through the broker market, but also deal directly with other banks and onshore market players and exchanges (Lipscomb, 2005).

Section III

Features of Indian Rupee NDF market

Trading platform and offshore centre

NDFs are primarily over-the-counter, rather than exchange-traded products, thus making it difficult to gauge the volume of contracts traded, who trades the contracts, and where they are traded. At the international level, New York tends to dominate trading in Latin American NDFs, Singapore (and to a lesser extent Hong Kong) dominate trading in non- Japan Asian NDFs, while London spans these markets. The INR NDF is largely concentrated in Singapore and Hong Kong, with small volumes being traded in the Middle East (Dubai and Bahrain) as well.

NDF Market Regulation

At present, there are no controls on the offshore participation in INR NDF markets. The onshore financial institutions in India, however, are not allowed to transact in the NDF markets. Domestic banking entities are allowed specific open position and gap limits for their foreign exchange exposures and through these limits domestic entities could play in the NDF markets to take advantage of any arbitrage or even speculate. This itself restricts the extent to which domestic banks could participate in NDF markets. The objective has been that allowing domestic banks to participate in the NDF markets would require an enhanced level of intervention from the Reserve Bank of India (RBI) to protect Indian rupee from any speculative attack.

Market Players

NDF market players generally operate with an objective of hedging, speculating and arbitraging. While the INR NDF market has been around for over the last 10 years or so, the characteristics of this market seem to have evolved over this period in tandem with the onshore exchange controls and regulations. In the late 1990s the NDF market was provided liquidity by foreign residents who had a genuine exposure to the Indian rupee but were unable to hedge their exposure in the domestic market due to existing controls. However, with the gradual relaxation of the exchange controls, reasonable hedging facilities are available to offshore non-residents who have exposures to the rupee, especially when compared with the hedging facilities provided by some other competitor Asian countries such as China. Hence, the INR NDF market presently derives its liquidity largely from (i) Non-residents wishing to speculate on the Indian rupee without any exposure to the country, and from (ii) arbitrageurs who try to exploit the differentials in the prices in the two markets without any outlay of capital on their part by two offsetting transactions. (For the Indian rupee it is believed that arbitrage is profitable when there is difference of around 10 paise in the forwards prices. Such opportunities are not very common, but tend to occur whenever speculative actions increase).

The behaviour of NDF market players depends critically on their objective for participation. Foreign investors who participate in the NDF market to hedge their exposures generally take long positions *e.g.* multinational companies. Speculators, on the other hand, operate mostly in the short end of the market *e.g.* hedge funds, also corporates entities with an international presence who undertake speculative or arbitrage trades, jewel exporters and manufacturers that constitute another group who are active arbitraging between domestic and NDF markets.

As reported by market participants, some of the foreign banks which trade in the rupee NDFs include Deutsche Bank, UBS AG, Standard Chartered Bank, Citibank, JP Morgan Chase, ABN Amro, Barclays, ANZ Investment bank and BNP.

Settlement period

The settlement period refers to the gap between the day the NDF contract is fixed and the actual delivery date. The fixing date is the day on which the comparison between the NDF rate and the prevailing spot rate is made. The settlement date is the day whereby the difference is paid or received. Depending on the currencies dealt, there are variations whereby for some currencies, the settlement period is one day whereas for others it is two business days. Generally, the spot rate used in the NDF market is based on a reference page on Reuters or Telerate with a fallback of calling four leading dealers in the relevant market for a quote. For the Indian rupee NDF, the RBI reference rate is generally used as the fixing rate.

Market Turnover

Information on the traded volumes in the NDF market is rather difficult. Various estimates are available though they are published with a lag. As per an estimate by HSBC for mid-2003, the daily volumes for INR NDF was about US $ 100 million. The latest available information on NDF turnover indicates a substantial pick up in NDF turnover in Indian rupee in line with the pick up in domestic onshore spot and forward market turnover. The NDF market turnover, however, remains small when compared with onshore market turnover. The daily average turnover in the spot market is about 4.4 times and forward/swap market is about 4.1 times the turnover in the NDF market (Table 2). The turnover is high for 1-month and 1-year maturity. As compared with some other Asian currencies traded in the NDF market such as the Korean won, Chinese yuan and Taiwanese dollar, the turnover in the NDF market is very small for Indian rupee.

Bid Offer Spreads

Markets are generally, perceived as efficient when market prices reflect all available information, so that it is not possible for any trader to earn excess profits in a systematic manner. The efficiency/ liquidity of the foreign exchange market is often gauged in terms of bid/offer spreads. The bid-ask spread refers to the transaction costs

Table 2: Daily average turnover on Indian spot, forward and NDF market during 2007

(US $ million)

Spot		16,381
Forward/Swap		15,378
NDF		3,736
Of which	1 Month	993
	2 Month	735
	3 Month	990
	6 Month	913
	1 Year	1,018

Note : Turnover for NDF is the average daily volume of NDF bidding for the period January 5 to April 20, 2007. Turnover of spot, forward and swap is for January-April, 2007.

Source : Reuters and Reserve Bank of India.

and operating costs involved with the transaction of the currency. With the increase in the volume of transaction of the currency, these costs/bid-ask spreads may reduce.

In India, the spread is almost flat and very low in the spot segment of the foreign exchange market. The spread in the NDF segment remains higher than that of the spot and forward market reflecting lower liquidity in the NDF market (Table 3)[3]. As compared with other Asian currencies, the spreads for Indian rupee NDFs remain lower than that of Indonesian Rupiah and Philippine peso, but higher than that of Chinese renminbi and Korean won reflecting the higher liquidity available in the latter two currencies (Table 4).

Table 3: Bid-ask spread (Re-USD) in Foreign Exchange market

(in per cent)

	Spot	**Forward**	**1M NDF**	**3M NDF**	**6M NDF**
1	2	3	4	5	6
Average	0.03	0.09	0.11	0.21	0.29
Min	0.01	0.02	0.05	0.11	0.15
Max	0.17	0.38	0.28	0.29	0.34

Source: Reuters, Authors' calculation.

Table 4: Bid-Ask Spreads in NDF market for select Asian currencies

(in per cent)

	1M NDF	3M NDF	6M NDF
1	2	3	4
Chinese Yuan			
Average	0.06	0.06	0.09
Min	0.01	0.01	0.01
Max	0.76	0.13	0.61
Korean Won			
Average	0.09	0.10	0.14
Min	0.01	0.02	0.02
Max	0.34	0.24	0.29
Indonesian Rupiah			
Average	0.51	0.73	1.09
Min	0.22	0.22	0.28
Max	1.92	2.73	3.13
Philippine Peso			
Average	0.22	0.23	0.39
Min	0.09	0.09	0.14
Max	0.51	0.51	0.75

Source: Reuters, Authors' calculation.

Market Volatility

Looking at the volatility in the INR NDF market, it is observed that NDF volatilities have been consistently higher than their spot counterparts (Table 5). This is essentially attributed to official intervention in the spot and forward markets by the Reserve Bank. This is a feature observed for most other Asian currencies, particularly

Table 5: Volatility of Indian rupee

(in per cent)

Market	Volatility
1	2
Spot	0.24
Forward	0.27
1M NDF	0.35
3M NDF	0.50
6M NDF	0.47

Note : Volatility is calculated from the standard deviation of the percentage return of rupee-dollar exchange rates.

Source : Reuters, Authors' calculation.

China, Philippines and Taiwan where intervention is an important component of monetary policy (Ma *et al.* 2004).

Section IV

The Linkage between Onshore (spot and forward) and Offshore (NDF) market for Indian Rupee

Causality between NDF and onshore Spot and Forward market

With an objective to examine the causal link between the spot, forward and NDF market for Indian rupee, Granger causality test was carried out. The results are reported in Table 6[4]. As expected, two way causation was exhibited between percentage change in spot and forward rupee-dollar rates as the null hypothesis is rejected at very low levels of significance. Further strong unidirectional causality was observed from percentage change in spot to NDF rates and forwards to NDF rates reflecting the fact that the price in the NDF market is determined primarily on the basis of the RBI reference rate. The causality from NDF to spot and forward markets, however, remained insignificant[5]. Such a result seems obvious in the Indian context given the fact that the domestic market players participation in offshore NDF market for Indian rupee is limited. A similar result

Table 6: Pairwise Granger Causality Tests

Null Hypothesis:	F-Statistic	Probability
1	2	3
RFW does not Granger Cause RSP	4.27*	0.00
RSP does not Granger Cause RFW	4.10*	0.00
RNDF1 does not Granger Cause RSP	2.02**	0.06
RSP does not Granger Cause RNDF1	21.97*	0.00
RNDF1 does not Granger Cause RFW	0.80	0.57
RFW does not Granger Cause RNDF1	17.84*	0.00

* and ** stand for rejection of the null hypothesis at 5 percent and 10 per cent level of significance respectively.

Note: RSP = Percentage return on rupee-dollar spot rates;
RFW = Percentage return on 1 month forward rupee-dollar rates and
RNDF1 = Percentage return on 1 month rupee-dollar NDF rates.
Selected lag length = 6

has also been obtained in the case of Chinese renminbi (Higgins and Humpage, 2005). According to the findings of the study, NDF market's inability to precisely predict the future level of the spot exchange rate was due to the fact that the underlying spot exchange rate is subject to government restrictions, official interventions and large discrete changes.

Spillover effects between NDF and onshore market

To further explore the interrelation and information flows among the various onshore and offshore markets for Indian rupee, empirical tests were conducted to examine whether the higher volatility in the NDF market (as observed in previous section) has some spillover effects on volatility in the spot market. Despite the growing turnover in the Asian NDF market, studies on NDF market analysis are limited. Empirical exercises to explore the operation of the NDF markets are rather negligible. Park (2001) has tried to analyse the information flow between NDF and spot market for Korean won that is one of the highest traded currencies in the Asian NDF.

Following the methodology used by Park (2001) to examine the volatility spillover effects between onshore and offshore market, the augmented GARCH model is estimated. Prior to estimation of augmented GARCH model, the information variable (lagged residuals) is generated from a vanilla type GARCH model since the financial timeseries data are conditionally heteroscedastic and follow a GARCH (1,1). The augmented GARCH model is further extended to include exogenous variables and is utilized to investigate mean and volatility spillover effects between NDF and spot/forward markets. Thus, the GARCH(1,1) is of the form:

ε (1)

(2)

with α and

where is the rupee-dollar percentage return in market i (Spot/ Forward/NDF) at time t,

$=\beta$

X represent a set of exogenous variables (including the AR and MA terms), which determine ,

ε is a conditional residual term follows a normal distribution of mean 0 and variance h_t with the given information set , and

is the conditional variance of rupee-dollar exchange rate changes of market i at time t.

Taking the lagged residuals from the above model, the augmented GARCH(1,1) can be of the form:

$$= + \quad _ + \delta \quad + \xi \tag{3}$$

$$= \alpha \quad + \alpha \ \xi \ _ + \beta \quad _ + \gamma \varepsilon \ _ \tag{4}$$

with $\alpha \ \beta \ \gamma >$ and

where is the rupee-dollar percentage return in market i at time t,

_ represents the rupee-dollar percentage return in market j at one period lag, which shows the mean spillover effect from market i to market j,

$\Omega + \beta <$

X represent the set of exogenous variables (including the AR and MA terms), which determine ,

is the conditional variance on rupee-dollar exchange rate changes of market i at time t,

ξ _ is the one period lagged squared residuals from the mean equation (3) and

ε _ is one period lag squared residuals from the GARCH(1,1) model jointly determined from equation (1) and (2), which exhibits the volatility spillover effect from market j to market i.

Results of the empirical analysis are reported in Table 7[6]. As observed earlier, mean spillover effect represented by coefficient b_i from both spot and forward to NDF market is significant with the counterparty lagged return coefficient being high. The mean spillover effect in the reverse direction *i.e*. from NDF to spot and forward is observed to be insignificant. This reflects the fact that information flows

Table 7: Volatility spillover effect

	Coefficients				
Variable		α			
i = Spot	0.06	0.01	0.17	0.61	0.05
j = NDF1	(1.56)	(2.32) *	(2.51) *	(6.61) *	(2.00) *
i = Forward	0.02	0.01	0.24	0.57	0.07
j = NDF1	(0.37)	(2.15) *	(3.05) *	(4.74) *	(1.67) **
i = NDF1	0.43	0.01	0.17	0.53	0.36
j = Spot	(5.09) *	(2.43) *	(2.28) *	(7.01) *	(2.80) *
i = NDF1	0.36	0.01	0.16	0.71	0.10
j = Forward	(4.78) *	(1.61)	(2.59) *	(6.90) *	(1.20)

***** and ** stand for rejection of the null hypothesis at 5 percent and 10 per cent level of significance respectively. Figures in brackets are t-stastics.

from spot and forward markets to determine the returns in NDF market, thus, supporting the efficient market hypothesis for NDF market.

The coefficient γ reflects the volatility spillover impact between the markets. As can be observed this coefficient is significant from spot to NDF which is expected, considering that NDF market draws information from spot market. It is also important to mention here that this effect from spot to NDF is quite strong. The volatility spillover effect doesn't exist from forward to NDF.

It is also observed that this coefficient is also significant from NDF to spot and forward markets. This indicates that there is volatility spillover from NDF to spot market and NDF to forward market although the spillover effect is not large given the low value of the coefficients in both the cases.

Onshore/Offshore Interest Rate Spreads

Another way to look at market efficiency is to analyse the extent of market segmentation between onshore interest rates and offshore interest rates implied by the NDFs. Under the covered interest parity condition, the forward exchange rate of the home currency, in the absence of capital controls, is linked by arbitrage to its spot rate and

the interest rate differential between the home currency and the US dollar as set out in equation 5 :

$$F = S(1+r)/(1+r^{\$}) \qquad (5)$$

where F is the forward rate, S the spot rate, r the interest rate on the home currency and $r^{\$}$, the US dollar interest rate. When there are no cross-border restrictions, borrowing and lending ensure that the above holds.

However, when capital controls bind, non-residents may not have full access to onshore credit or placements, giving rise to NDFs (equation 6).

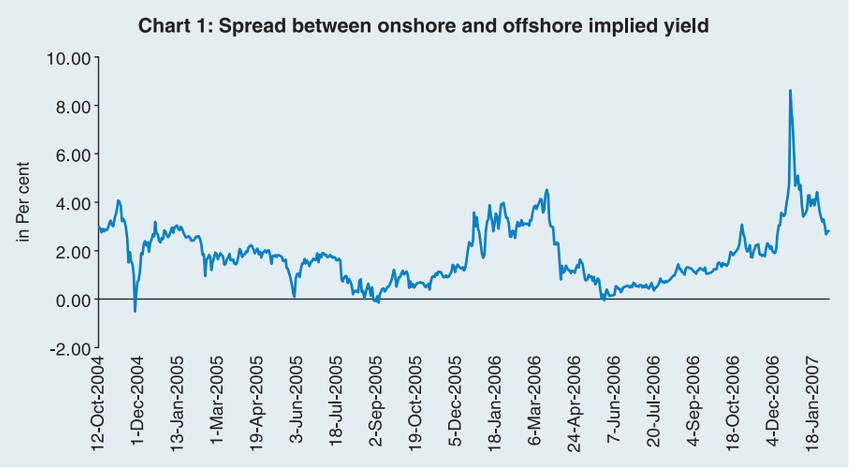
$$NDF = S(1+i)/(1+r^{\$}) \qquad (6)$$

where i is the NDF-implied yield on the home currency offshore.

To the extent that the arbitrage between the onshore money market and offshore NDF market is effectively constrained by capital controls, the NDF-implied offshore interest rate, i, can differ considerably from the interest rate prevailing in the onshore money market, r. A large and persistent onshore/offshore spread ($r - i$) indicates the presence of effective cross-border restrictions.

Further, the sign of the onshore/offshore yield spread can signal underlying market pressure on the currency. An onshore interest rate above its offshore NDF-implied counterpart would indicate underlying appreciation pressure on the home currency but effective capital controls limiting capital inflows into the home currency. An onshore rate below its offshore counterpart would indicate depreciation pressure but effective stemming of capital outflows. A zero spread may suggest the absence of effective capital controls, or the absence of market pressure on the home currency, or both.

Based on the above analogy, the NDF implied yield on the Indian currency offshore was computed using data for the period November 2004 to February 2007. In the absence of a meaningful/comparable onshore money market rate, an equivalent approach generally used



is to estimate the implied onshore yield on the home currency using the onshore deliverable forward premia and then to compare it with the NDF implied offshore yields. Accordingly, the implied forward yield and spread have been computed for the Indian rupee (Chart 1). The non-zero spread between the implied yield in the forward and NDF market seems to be indicative of presence of capital controls in India that weaken and prevent cross border arbitrage to some extent. During this period, the offshore implied yield has also mostly remained lower than onshore rates reflecting the general appreciation pressure on the rupee onsore during this period. On certain occasions, the spread has touched zero implying no underlying pressures on the domestic INR.

It is interesting to compare the above findings with the results of Ma *et al.* 2004. For the period January 1999 to December 2001, they had observed the spread to be mostly negative implying continuing depreciation pressures operating in the Indian economy. In fact this was true for most Asian currencies in the post East Asian crisis period. The absolute spread was also very high ranging from (-) 400 to (-)1000 basis points during that period. For the period 2004-2007, the spreads seem to have narrowed considerably ranging between 0-400 basis points[7]. This feature could be attributed to the growing liquidity in the INR NDF markets and the diminishing capital controls in India during the past 6-7 years[8].

An interesting observation from the recent trend with regard to the implied NDF yields depicts the fact that despite substantial capital controls, Chinese yuan is observed to have a very low implied yield in the NDF market *vis-à-vis* other Asian currencies including Indian rupee. For example, the one year NDF implied yield for Chinese yuan is presently placed at around 0.2 per cent as against 7-8 per cent for the Indian rupee NDF implied yield. This is essentially attributed to relatively controlled currency of China along with low domestic yuan interest rates.

Section V

Policy Perspective

Policy Implications of NDF market

From a broader perspective, markets for non-deliverable currency forwards (NDFs) are of interest to policy makers because they are a product generally used to hedge exposure or speculate on a currency movement where local market authorities limit such activity. NDF prices are also a useful tool for market monitoring in that these prices reflect market expectations, and supply and demand factors that cannot be fully manifested in onshore prices in a country with capital controls. The difference between onshore currency forward prices, where they are available, and NDFs can increase in periods of heightened investor caution or concern over potential change in the exchange rate regime or a perceived increase in onshore country risk (Lipscomb, 2005).

In the Indian context, as can be observed from the previous sections, the NDF market draws its information mostly from the onshore spot and forward markets and the reverse causality is poor. The NDF market turnover volumes are also not large enough to affect the domestic onshore INR market. Yet it may be important from the policy angle to take cognizance of the developments in the NDF markets. There are evidences of volatility spillover from NDF market to onshore spot market, though not large. Hence, if not in regular market conditions, in volatile market conditions the NDF market transactions can have an impact on the domestic spot markets. It

would be pertinent to monitor the NDF prices so as to tap the additional information with the NDF market players especially pertaining to dollar movements in offshore markets. Besides, prices in the NDF market can be a useful informational tool for authorities and investors to gauge market expectations of potential pressures on the exchange rate in future. Gradually, however, once India moves on to fuller capital account convertibility, the NDF transactions are going to perish. Till that time, close monitoring of the NDF market activity could be crucial. The relatively low turnover and marginal volatility spillover impact, however, discounts for the need of regulatory control on these markets.

Recent Policy Initiatives

Efforts have been made towards improving the hedging facilities that are available to offshore non-residents who have exposures to the rupee, particularly the foreign direct investors. As far as the foreign institutional investors (FIIs) are concerned, they were not allowed to rebook contracts once cancelled till recently. The Committee on Fuller Capital Account Convertibility (FCAC) recommended that to minimise the influence of NDF markets abroad, the FIIs may be provided with the facility of canceling and rebooking forward contracts and other derivatives booked to hedge rupee exposures. The Mid-Term Review of Annual Policy Statement 2006-07, announced by the Reserve Bank of India in October 2006 proposed to implement this recommendation. Accordingly, AD category – I banks have been permitted to allow FIIs to cancel and rebook forward contracts up to a limit of 2 per cent of the market value of their entire investment in India as at the beginning of the financial year. The outstanding contracts must also be duly supported by underlying exposure at all times.

Besides, recently initiatives have been undertaken to expand the range of hedging tools available to the domestic market participants to hedge economic exposures *viz.*, importers' customs duty component, price risk on aluminium, copper, lead, nickel and zinc in international commodity exchanges, actual users of aviation turbine

fuel (ATF) to hedge their economic exposures in the international commodity exchanges, free cancellation and rebooking of forward contract up to 75 per cent, 100 per cent for corporates with overseas direct investments and small and medium enterprises (SMEs).

Section VI
Concluding Observations and Future Outlook

With the growing interest of the global players in the Indian economy and the consequent increase in capital inflows into India over last few years, there has been an increase in liquidity in the INR NDF market. This market essentially draws information from the onshore spot and forward markets. The bid-offer spread and volatility in this market has, however, generally remained higher than that of onshore counterparts. While the offshore NDF rates do not directly influence the spot and forward rates in the domestic market, volatility in NDF markets is empirically tested to influence the onshore markets.

Looking forward, India is expected to remain an attractive destination for foreign investors in near future. Consequently, transactions in NDF market may rise to hedge against rupee exposure. The activity in the NDF market will also be governed by the following factors: (a) further move towards capital account convertibility, the roadmap for which has been provided by the FCAC (b) further development of financial markets particularly in terms of better fulfillment of interest rate parity conditions (c) introduction of more and more derivative products for both onshore and offshore investors so as to provide them more avenues for hedging in the domestic market, particularly to offshore investors and lastly, (d) complete phasing out of the underlying exposure criteria for booking a forward contract.

With India continuing its initiatives towards further opening up of the capital account, the NDF market activity is expected to decline and finally disappear. However, so long as there is differential treatment between residents and non-residents with regard to their operation in derivatives market, offshore INR NDF market will continue to thrive. Till that point, the NDF markets could be regarded

as essential for sustenance of offshore investor's interest in the domestic economy. Activity in the NDF market needs to be closely monitored to keep track of the pressures operating on the Indian currency as well as to prevent speculative attack on Indian currency during volatile conditions.

Notes:

[1] In case of Malaysia, it is also stated that "offshore banks possibly refrained from engaging in creative transactions such as NDF to circumvent the controls so as not to risk their local franchise." In countries where major market players have strong incentives to build and maintain good relationships with regulators, the effectiveness of regulations is more likely to be ensured (Ishii, 2001).

[2] Korean authorities briefly sought to limit the effect of NDF demand on local markets by restricting local banks' participation in the NDF market. The presumed intent was to lessen the need for central bank intervention as the effect of foreign demand for long won positions would be limited onshore. The regulations were reportedly seen as adversely affecting local banks and were subsequently largely rescinded.

[3] The percentage spread is calculated as: (Ask-Bid)/ [(Ask+Bid)/2] * 100.

[4] The detailed discussion about the estimation is reported in Annexure II.

[5] NDF Granger causes spot at 10 per cent level of significance.

[6] The constant term in conditional variance equation, ARCH and GARCH coefficients are significant and have expected signs except in the last case where the constant term is insignificant.

The detailed discussion on estimation and empirical results is reported in Annexure II.

[7] There was one occasional spike in the spread to 800 basis point on December 26, 2006 associated more with liquidity pressures in the domestic market on that day.

[8] Any interpretations of onshore/offshore interest spreads need qualifications. Ideally, the comparison should be between a liquid onshore bank interest rate and a similarly liquid offshore implied rate. But the fact that the domestic money market is most liquid at short maturities, while NDF markets tend to be more liquid at medium to long maturities, makes it hard to find good liquidity at matching maturities.

References:

Higgins, Patrick and Owen F. Humpage (2005), "Nondeliverable Forwards: Can We Tell where the Renminbi Is Headed?" *Federal Reserve Bank of Cleveland*, September.

Ho, Corrinne, Guonan Ma and Robert N. McCauley (2005), "Trading Asian currencies", *BIS Quarterly Review*, March.

Ishii, S, I Otker-Robe and L Cui (2001), "Measures to limit the offshore use of currencies: pros and cons", *IMF Working Paper*, WP01/43, April.

Lipscomb, Laura (2005), "An Overview of Non-Deliverable Foreign Exchange Forward Markets", *Federal Reserve Bank of New York*, May.

Ma, Guonan, Corrinne Ho and Robert N McCauley (2004), "The markets for non-deliverable forwards in Asian currencies" *BIS Quarterly Review*, June.

Park, Jinwoo (2001), "Information flows between non-deliverable forwards (NDF)/and spot markets: Evidence from Korean currency", *Pacific Basin Finance Journal*, 9(4), pp. 363-377.

Reserve Bank of India (2005), "Report of the Internal Technical Group on Foreign exchange Markets", www.rbi.org.in.

Reserve Bank of India (2006), "Report of the Committee on Fuller Capital Account Convertibility", (Chairman Shri S.S.Tarapore).

Singhania, Kamal (2006), "Non-deliverable forwards" in *Developments in Money, G-sec and Forex Markets in recent years*, The Clearing Corporation of India Ltd.

ANNEX I

Extant Restrictions on Forward Exchange Market

People's Republic of China	
Forward exchange market	Forward exchange operations by the Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, Bank of Communications, CITIC Industrial Bank, and China Merchants Bank are allowed with respect to current transactions, banks' own foreign exchange loans, and repayment of foreign exchange loan obtained abroad and registered with the SAFE, with a maximum maturity of 365 days.
Controls on Derivatives and other Instruments	
Purchase locally by nonresidents	These transactions are not allowed.
Sale or issue locally by nonresident	These transactions are not allowed.
India	
Forward exchange market	ADs are allowed to deal forward in any permitted currency. The RBI may enter into swap transactions with ADs, under which it buys or sells spot U.S. dollars and sells or forward dollars for maturities available in the market. A resident may enter into forward contracts with Ads to hedge against exchange risks. Forward contracts of importers and exporters booked and outstanding must not exceed at any point of time 100% of the eligible limit, provided that any amount in excess of 20% of the eligible limit shall be only on a deliverable basis. The eligible limit is defined as the last three years" average of import or export turnover, or the previous years" turnover, whichever is higher. A resident with an underlaying contract may enter into a forward contract with an AD in India to hedge exposure to exchange risk to the full extent of such a contract. ADs may provide forward exchange cover to foreign institutional investors (FII) up to the full extent of their investment in debt instruments and equities. FIIs may hedge the entire market value of their investments in debt instruments and equities. FIIs may hedge the entire market value of their investments in equities. ADs may also provide forward cover not exceeding six months to foreign direct investors to hedge their currency risk arising from proposed direct investments in India after ensuring that the foreign entity involved has completed all formalities and obtained the necessary approvals (where applicable) for the investment in India.

	Nonresident Indians (NIRs) may enter into forward contracts with ADs to hedge the amount of dividends due them or the balances held in their foreign currency nonresident (FCNR) accounts or nonresident external (NRE) accounts. They are also eligible to have forward cover with respect to their investments in portfolio investment schemes. ADs may offer plain vanilla European forward options to customers who have genuine foreign currency exposures. All conditions applicable for booking, rolling over, and canceling forward contracts are applicable to options contracts. Only one hedge transaction can be booked against a particular exposure or part thereof for a given time period. Options contracts also cannot be used to hedge contingent or derived exposures, with the exception of exposures arising from the submission of tender bids in foreign exchange. Residents with overseas direct investments in equities and loans may hedge against exchange risks arising from such investments.
Controls on Derivatives and other Instruments	
Purchase locally by non resident	ADs may offer forward or option contracts to nonresidents outside India to hedge their direct investments that were made in India after January 1, 1993, subject to verification of exposure in India. FII may hedge the market value of their entire investment in equity or debt. NRI may hedge the dividends due to them, balances held in FCNR and NRE accounts, and portfolio investments. FII and NRIs may trade in all exchange-trade derivative contracts that have been approved by the SEBI, subject to prescribed limits. FIIs and NRIs may also invest in these contracts using rupee funds held in India on a nonrepatriable basis, subject to the limit prescribed by the SEBI.
Sale or issue locally by non resident	These transactions are not allowed.
Republic of Korea	
Forward exchange market	There are no controls on the trading of over the counter-related derivatives if the transactions are made through domestic foreign exchange banks. However, transactions in credit derivatives with the domestic foreign exchange banks and those directly related to specific capital transactions require BOK notification. Security companies may carry out freely transactions in derivatives-such as forwards, foreign exchange swaps, foreign currency swap options, and interest rate swap options - with nonresident juridical persons. Other transactions in derivatives require BOK approval.

Controls on Derivatives and other Instruments	
Purchase locally by non resident	Yes
Sale or issue by non resident	There are controls on all derivative transactions by nonresidents involving the use of won-denominated financing.
Indonesia	
Forward exchange market	If there is no underlying local investment activity, forward foreign currency contracts offered by domestic banks to nonresidents are limited to $ 3 million or its equivalent a customer. These restrictions do not apply to investment-related transactions, such as equity participation, purchase of securities, and provision of credit.
Controls on Derivatives and other Instruments	
Purchase locally by nonresident	Nonresidents are not allowed to buy real estate. However, they are permitted to engage in inward direct investments in local real estate.
Sale locally by non residents	Yes.
Philippines	
Forward exchange market	All forward contracts to sell (*i.e.* excluding purchases) foreign exchange to nonresidents with no full delivery of principal, including cancellations and rollovers/renewals, require prior BSP clearance. All long-term (exceeding one year) foreign exchange forward contracts and nondeliverable forward (NDF) contracts (whether with residents or nonresidents) may only be undertaken by banks with expanded derivatives licenses. The BSP authorizes the rollover, without prior approval, of short-term deliverable forward contracts with nonresidents at every maturity during the course of the underlying long-term Philippine government securities, provided that (1) the underlying transactions for each short -term deliverable foreign exchange forward contracts are BSP-registered foreign investments in government securities, (2) the actual delivery or settlement of the foreign contract coincides with the date of the repatriation of the BSP-registered investments, (3) the value of the forward contract does not exceed the foreign currency equivalent of the maturity value or net proceeds of the BSP -registered investments computed on the basis of the agreed forward exchange rate (4) the repatriation and remittance out of the country of the BSP-

	registered investments comply with the documentary requirements under existing BSP rules, and (5) the bank concerned submits to the BSP a weekly report on forward contracts with nonresidents. The maturity of all forward contracts -*i.e*. outright forward and forward swap contracts to cover long-term foreign currency requirements- may not exceed six months. The maturity of foreign exchange forward (whether deliverable or nondeliverable) and swaps (sale of foreign exchange at the first leg and purchase of foreign exchange at the second leg) must not be longer than (1) the maturity of the underlying foreign exchange obligation or (2) the approximate due date or settlement of the foreign exchange exposure. However, for foreign currency loans, the maturity of deliverable foreign exchange forwards must be coterminous with the maturity of the underlying obligation. The maturity of the above mentioned swap contracts may not be less than 30 calendar days and not longer than (1) the maturity of the underlying foreign exchange obligation or (2) the approximate due date or settlement of the foreign exchange exposure.
Controls on Derivatives and other Instruments	
Purchase locally by nonresident	Derivative involving forward purchase of foreign exchange by nonresidents are not allowed, except for BSP - registered foreign investments under certain conditions.
Sale or issue locally by nonresidents	Swap contracts involving the sale of foreign exchange by nonresidents to bank as a first leg require BSP approval. NDF foreign exchange sales by nonresidents require prior BSP clearance.
Malaysia	
Forward exchange market	Forward exchange contracts may be effected for both commercial and financial transactions. For financial transactions, prior approval is required. For commercial transactions, forward cover for import may be provided for up to 12 months from the intended date of import, while for export purposes, forward cover may be provided for up to 6 months from the export date. Effective contracts to buy or sell foreign currency against ringgit or another foreign currency to hedge (1) payment or receipts for current account transactions, based on firm commitments or on an anticipatory basis (for forward contracts entered into on an anticipatory basis), the total outstanding value of forward contracts should not exceed the total amount paid or received; (2) payment for permitted investment abroad including lending to nonresidents in foreign currency, other than from conversion from ringgit for placement in a foreign currency account

	(FCA); (3) foreign currency exposure of permitted investments abroad; and (4) prepayments or repayments of permitted foreign currency credit facilities that are payable within the next 24 months. Second, nonresidents may enter into forward contracts to buy or sell foreign currency against ringgit to hedge (1) committed payments or receipts for current account transactions that are permitted to be settled in ringgit with residents, and (2) committed inflow and outflows for investment in, or divestments of, ringgit assets other than funds in external accounts, including fixed deposits negotiable instruments of deposits in ringgit, and over-the-counter derivatives or structured products that are tantamount to lending or borrowing of ringgit between residents and nonresidents Nonresident intermediaries may enter into swap arrangements not exceeding three working days with licensed onshore banks to cover payment for ringgit securities purchased by the nonresident intermediaries' nonresident clients with the following conditions: (1) swap arrangement shall be based on a firm commitment and not be on an anticipatory basis; and (2) the maturity date of the arrangement shall be the committed payment date with no rollover option. Multilateral development banks (MDBs) and foreign multinational corporations (MNCs) that are allowed to issue ringgit-denominated bonds may enter into forward contracts foreign currency for ringgit to meet coupon or principal payment of the bonds. In addition, they may also purchase forward foreign currency for repatriation of proceeds of the issuance abroad. Forward contracts against ringgit entered into by ADs and approved merchant banks are subject to net open position limits. Effective April 1, 2004, residents are allowed to sell forward nonexport foreign currency received for ringgit or another foreign currency to an AD or an approved merchant bank for any purpose up to the tenure of the underlying transaction, provided that the transaction is supported by a firm underlying commitment to receive the currency (previously, such receivables could be sold forward up to 12 months only).Also effective that date, residents with permitted foreign currency borrowing are allowed to enter into interest rate swaps with an onshore licensed bank, an approved merchant bank, or a licensed offshore bank in Labbuan, provided that the transaction was supported by a firm underlying commitment to receive the currency. Forward exchange contracts against the ringgit or another foreign currency with nonresidents require the prior approval of the Controller of Foreign Exchange (COFE), with

	following exceptions: (1) ADs may enter into short-term currency swap arrangement with nonresident custodian banks and stockbroking companies for payments of share purchase on the Malaysia Security Exchange Berhad (MSEB) that have maturities of up to three working days and that are based on firm commitments; and (2) ADs may enter in to outright ringgit forward sale contracts with nonresidents that have maturities of up to three working days and that are based on firm underlying commitments to purchase share on the MSEB. Forward Exchange contracts against foreign currency entered into by ADs and approved banks with nonresidents are subject to net open position limits.
Controls on Derivatives and other Instruments	
Purchase locally by nonresident	No controls apply on the trading of futures and options by nonresidents on the Malaysian Derivatives Exchange.
Sale or issue locally by nonresidents	The issuance of derivatives by nonresidents requires approval from the COFE. The purchase of foreign currency-denominated derivatives not traded on a future exchange in Malaysia by residents to nonresident requires prior approval.
Thailand	
Forward exchange market	Financial institutions may engage in spot foreign exchange market transactions with nonresidents in local currency. Approval is required for nonresidents to sell foreign currencies for baht for same-day delivery (value same day) and for next -day delivery (value tomorrow) Forward transactions must be related to the underlying trade and financial transactions.
Controls on Derivatives and other Instruments	
Purchase locally by nonresident	In case where there are no underlying trade and investment activities in Thailand, both credit facilities, including swap and forward exchange contracts obtained by a nonresident from all domestic financial institutions combined, are subject to maximum outstanding limit of 50 million. The nonresident's head office, branches representative offices, and affiliated companies are counted as one entity.
Sale or issue locally by nonresidents	The issuance of warrants or equity-related instruments and bonds by nonresidents in the local market is subject to approval by the SEC. The approval criteria are based on the soundness of the underlying stock. There is no penalty for nonresidents for participating in financial market.

Source : Annual Report on Exchange Arrangements and Exchange Restrictions, International Monetary Fund, 2006.

ANNEX II

Data and some empirical results

Data

The data used in the study are daily series and collected from the Reuters database. The study spans from December 10, 2004 to February 9, 2007. However, the period chosen is different for the tables and empirical analysis as per the data availability and comparability since the longer timeseries data are not available for all the currencies. Also the NDF turnover data are available for very short period.

The exchange rates (spot, forward and NDF) used in this paper are the closing prices for bid and ask. The bid-ask spreads reported in the study are the average percentage spreads, *i.e*. the difference between ask and bid prices, and divided by the average of the two multiplied with 100 for expressing in percentage terms.

Empirical results

All the variables used for empirical work have been tested for unitroots. However the exchange rates are non-stationary at their levels, they are stationary when taken in percentage return terms in all the cases.

For Granger-causality tests, the variables used are spot, forward and NDF returns and they are stationary. The lag length is selected on the basis of final prediction error (FPE) and log-likelihood criteria and it is 6.

For estimating the augmented GARCH model, *i.e*. equation (3) & (4), the lagged residuals are derived from the GARCH (1,1) model, *i.e*. jointly estimating equation (1) & (2). The GARCH (1,1) is estimated to model spot, forward and NDF volatility where a variety of mean equations, *i.e*. ARMA models are chosen on the basis of AIC and SC criteria[#]. All the pre- and post-diagnostic tests like test

[#] Descriptive statistics were calculated for all the return series and were found to be fat tailed leptokurtic and non-normal. Further, before estimating GARCH(1,1) models, the unconditional mean equations were also estimated to check the presence of ARCH effect and the non linear autorrelation was found to be significant up to lag length 8 providing evidence for presence of ARCH effect.

of ARCH effect (LB-Q test, ARCH-LM test), coefficient stationary test (Wald test) were conducted and all the results were found to be robust. Further, all the coefficients in variance and mean equations were also statistically significant without violating any non-negativity restrictions. The results are reported in Table A1.

Table A1: Estimates of GARCH(1,1) model

Variable	Model	Coefficients		t-Statistics	DW	LB-Q(8)	LM(8)	Wald
1	2	3	4	5	6	7	8	9
Spot	ARMA(2,2)-GARCH(1,1)	C	-0.01	-1.83(0.07)**	1.91	2.39 (0.88)	2.43(0.96)	4.22(0.04) *
		AR (2)	-0.64	-3.45(0.00)*				
		MA (2)	0.68	3.77(0.00) *				
		C	0.01	2.52(0.01) *				
		ARCH	0.22	3.55(0.00) *				
		GARCH	0.65	7.53(0.00) *				
Forward	ARMA(2,2)-GARCH(1,1)	C	-0.01	-1.31(0.19)	2.03	2.39(0.88)	2.30(0.97)	3.56(0.09) **
		AR(2)	-0.86	-9.77(0.00) *				
		MA(2)	0.90	12.53(0.00) *				
		C	0.01	2.22(0.03) **				
		ARCH	0.27	3.67(0.00) *				
		GARCH	0.64	6.45(0.00) *				
NDF	AR(1)-GARCH(1,1)	C	-0.01	-0.89(0.37)	2.10	5.88(0.55)	5.94(0.65)	2.80(0.09) **
		AR(1)	-0.12	-2.26(0.02) *				
		C	0.01	1.94(0.05) *				
		ARCH	0.17	2.91(0.00) *				
		GARCH	0.74	8.17(0.00) *				

*, ** indicate the significance level at 5% and 10% level respectively. Figures in brackets are P-values.

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Monetary Conditions Index for India

R. Kannan, Siddhartha Sanyal and Binod Bihari Bhoi*

In India, against the backdrop of continuous development and integration of financial markets – both domestically and with the global economy – the role of rate channels in influencing monetary conditions has increased substantially in the recent past in contrast to the exclusive dominance of the quantum channel during the 1980s. This paper attempts to construct a monetary conditions index (MCI) for India in order to take both interest rate and exchange rate channels simultaneously into consideration while evaluating the stance of monetary policy and evolving monetary conditions. A "broad" MCI has also been constructed which incorporates credit growth as an additional indicator of monetary conditions. Our results reveal interest rate to be more important than exchange rate in influencing monetary conditions in India. In the Indian context, MCI has been effective to put together more than one indicator in order to provide a better assessment of the stance of monetary policy and reveals its role as a leading indicator of economic activity and inflation. Accordingly, our findings underscore the potential of MCI as a valuable indicator of monetary policy in India supplementing the existing set of multiple indicators adopted by the monetary authority.

JEL Classification : E52, E58

Keywords : Monetary Conditions Index (MCI), Rate Channel, Monetary Policy

Central banks, in the current globalised economic order, often face the difficult task of pursuing multiple objectives such as price stability, financial stability and non-inflationary growth even though it is widely recognised that price stability assumes prime importance,

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and other objectives are corollary to the prime one. For several emerging economies, the additional objectives of maintaining a stable exchange rate, a desired current account balance and an optimal level of reserves pose added challenges to the conduct of monetary policy. With such multiple – and often conflicting – objectives, no single channel of monetary transmission alone is considered enough today for any central bank to rely upon. Monetary policy affects output and prices through its influence on key financial variables such as interest rates, exchange rates, asset prices, credit and monetary aggregates with different lags. The variability of the lags is accentuated by the ongoing financial deregulation and innovations, both financial and technological, in a large number of economies. For monetary policy to be effective, it is, therefore, essential to have a broad understanding of these channels of monetary transmission. Accordingly, central banks have been increasingly monitoring and analysing multiple transmission channels simultaneously in drawing policy perspectives.

Consistent with the evolving policy objectives, the choice of intermediate targets is also transforming with time. Financial innovations and widespread cross-border capital flows in the recent past has made the conventional monetary targeting difficult to pursue in view of the doubts about the stability of the money demand function. This prompted several central banks to switch from exclusively targeting monetary or credit aggregates. Greater degree of trade openness and increasing capital flows have also imparted difficulties in targeting exchange rates inducing central banks to increasingly adopt flexible exchange rate regimes. Exclusive reliance on either monetary targeting or exchange rate targeting, thus, does not appear to be optimal for central banks in the conduct of contemporary monetary policy. However, in the absence of fully developed and integrated financial markets, central banks in most emerging market economies (EMEs) find it difficult to do away with the quantitative aggregates in their conduct of monetary policy. In particular, credit markets often play an important role to direct flow of resources to productive sectors of the economy. Thus, even as central banks in developing economies make use of short-term interest

rates, monetary policy continues to aim at influencing aggregate demand by altering the quantity and timely availability of credit along with changes in the price of credit.

Structural, institutional and recent technological developments led to greater integration of various segments of the financial market in the recent past. This, in turn, has facilitated faster transmission of monetary policy impulses, thereby helping interest rates to emerge as the most preferred operating instrument for several central banks. However, with the fast integration of financial markets across the globe, conduct of monetary policy is becoming increasingly interdependent imposing constraints on the discretionary power of local monetary authorities in pursuing their domestic goals. Thus, instead of relying on any single instrument, it has become necessary for central banks to assess overall monetary conditions arising out of changes in both domestic as well as external macroeconomic factors. To capture the relative importance of domestic and external factors, certain central banks during the 1990s attempted to construct a monetary conditions index (MCI), a combination of interest rates and exchange rates, to evaluate the efficacy of their monetary management. The shift in focus of monetary policy in many countries from intermediate targets to more explicit emphasis on final policy goals also called for quantifying the effects of policy instruments on inflation and growth.

The aim of construction of MCI is to take both interest rate and exchange rate channels into consideration and is motivated from the standard open-economy macro models. MCI is typically measured as the weighted sum of the change in the short-term interest rate and exchange rate relative to a base period, with the weights being generally derived from empirical econometric models reflecting estimated impact of these variables on output or inflation. Thus, MCI encapsulates the extent of internal and external influences on the overall monetary conditions of a country. Higher the weight of the interest rate relative to that of the exchange rate in the MCI, greater is the importance of the former relative to the latter in influencing aggregate demand or prices. The rise in interest

rate or appreciation of the exchange rates of the domestic currency, *ceteris paribus*, causes the economy to slow down and lowers inflationary pressures. A fall in interest rates or a depreciation of the domestic currency, on the other hand, generally stimulates the economy, *albeit* with the possibility of higher inflationary pressures in the long run. The change in MCI, thus, captures in a single number the degree of tightening or easing of the monetary conditions.

This paper attempts to construct MCI in the Indian context as an indicator supplementing the existing set of information variables (under the multiple indicator approach adopted by the Reserve Bank of India since 1998) employed in identifying the sources of changes in monetary conditions. Furthermore, it is also expected to provide a gauge on the relative importance of interest rates and exchange rate in the transmission mechanism of monetary policy in India.

The rest of the paper is organised as follows. Section II sets out the theoretical construct. Section III narrates the cross-country experience and presents a brief literature survey. Section IV describes the evolution of monetary conditions in India in the recent past and narrates the construction of "narrow" and "broad" MCI for India. Section V discusses the results and implications of MCIs in the Indian context. Section VI presents the conclusion.

II. The Theoretical Construct

As mentioned earlier, MCI is a weighted average of the change in the domestic interest rates and exchange rates, relative to their values on a pre-specified base date. MCI could be constructed in terms of the effect of the interest rate and exchange rate changes on either *"aggregate demand"* or *"prices"* (Freedman, 1994).

It can be computed using either nominal or real variables. In real terms, MCI at time t can be written as:

$$MCI_t = w_r (r_t - r_0) + w_e (e_t - e_0) \quad \text{..... (A)}$$

where r_t is the short-term real interest rate in period t, e_t is the logarithm of the real effective exchange rate (where a rise in e_t represents an appreciation of the domestic currency) in period t, and r_0 and e_0 are interest rate and the exchange rate, respectively, in a given base period and w_r and w_e are the MCI's weights, with $w_r + w_e = 1$ and the ratio w_r/w_e reflecting the relative impact of interest rate and exchange rate on a medium-run policy goal (*e.g.*, output or inflation).

It may be noted that, since the index is constructed using differences between actual and an "arbitrarily" chosen base period, the index only represents a relative degree of change and not an absolute measure. No significance is usually attached to the level of the index and it should not be interpreted too mechanistically. The index is usually used to judge the degree of tightening or easing in monetary conditions from the base or some other reference period.

MCI can be used for monetary policy in various ways – as an operational target, as a monetary policy rule or as an indicator of policy stance. For its use as an operational target, the construction of MCI is based on the deviation of interest and exchange rates from certain equilibrium values, thereby implying deviation of current MCI from its "desired" level, which is believed to be associated with the long run objectives of monetary policy. The use of MCI in this way is complicated as it is not only difficult to estimate equilibrium values of the variables, but they are also subject to unanticipated shocks. For its use as a policy-rule, MCI is re-arranged by normalising on the interest rate where the interest rate is set to offset movements in the exchange rate to correct deviations of actual inflation from target or of actual output from potential. For its use as an indicator of policy stance, MCI does not require changing the level of monetary conditions to its desired path as is the case with its use as an operational target. Rather the change in MCI provides information about the policy stance. For instance, MCI calculated relative to a benchmark/ base period indicate whether policy has become "tighter" or "easier" relative to that period. In this construct, the absolute value of the MCI does not offer any meaningful interpretation, rather it is the direction of movement which reveals the change in policy stance. Accordingly, MCI as defined above in (A) is an indicator of stance,

as changes in current interest rate and exchange rates are yet to have an effect on output and inflation.

Apart from interest rate and exchange rate, recent literature also emphasise on the role of bank lending channel, credit market channel and asset price channel in the transmission mechanism. However, none of the channels is considered self-sufficient independent of each other and their importance is always changing over time, adjusting with the changes in the financial system. It is argued that although central banks operate through short-term interest rates to influence the long-term rates, the connection is not well understood; regarding exchange rates, uncovered interest parity fails; on bank lending it is observed that tighter monetary policy does not necessarily imply tighter lending standards for banks; credit channel suffers as a significant portion of firm finance for investment comes from internal sources of funds such as retained earnings; and on asset prices, it is argued that monetary policy's influence is limited (see Cecchetti, 2006). Thus, there exists a view that when there are other channels of monetary transmission in addition to interest rate or exchange rate channels, it may be desirable to consider as many of them as possible to evaluate the general stance of monetary policy.

In view of this, along with the traditional MCI based only on interest rate and exchange rate, it may, thus, be worth exploring deriving broader definitions of MCI including other variables such as credit offtake or asset prices, which have a bearing on the ultimate objectives of monetary policy. In the Indian context, for example, bank credit may be considered to be an important constituent while constructing MCI as banks play a dominant role in financial intermediation and, therefore, credit supply remains an important channel of monetary policy transmission mechanism. Accordingly, along with the traditional "narrow" MCI, in this paper, we have also attempted to derive a broader MCI in the Indian context by including credit growth along with the traditional variables, *viz.*, interest rates and exchange rates.

III. Review of Literature and Cross Country Experience

The Bank of Canada pioneered the construction of MCI during the early 1990s in light of the close interlinkages between its money and foreign exchange markets. The adoption of the MCI as an operating target broadened the horizons of interest rate targeting by attempting to tackle exchange rate shocks. Nominal MCI served as the immediate operational target of monetary policy, supplemented by monetary data that had proved good leading indicators of output (especially real narrow money) and the inflation rate (especially broad money) (Freedman, 1994). The initial specifications of the Bank of Canada's MCI equation eventually changed from being based on inflation to aggregate demand so as not to alarm the market, as a once-and-for-all price shock could be misinterpreted as the start of an inflationary spiral.

MCI became popular in several countries particularly during the second half of the 1990s as a way of interpreting the stance of monetary policy and its effect on the economy. Although today no central bank embraces MCIs explicitly in the form of a rule, MCIs have been used as a supplementary information variable by certain central banks in order to judge divergences between the actual and desired monetary conditions and as indicators of policy stance alongside other information variables.

The Reserve Bank of New Zealand (RBNZ) also used to take a stance on the monetary conditions based on MCI and had been announcing a future path of MCI, conditional on available information and consistent with the monetary policy stance.

Many other central banks also adopted MCI as a useful indicator of overall monetary conditions. The Norges Bank, the Bank of Iceland and the Bank of Sweden have constructed MCI as indicators of monetary conditions while the Bank of Finland adopted the MCI as a leading indicator of the influence of monetary conditions on aggregate demand. Several international agencies such as the Organisation for Economic Co-operation and Development (OECD), the International Monetary Fund (IMF) and the European Monetary Institute and

investment firms such as Deutsche Bank, Goldman Sachs, J.P. Morgan have constructed MCIs to gauge monetary conditions for various countries (Table 1).

The Norges Bank used weightings produced by an inflation equation that, unlike the Phillips curve equation, did not take into account the output gap – the difference between actual GDP and potential GDP. Instead, it assigned a particularly large weight to the exchange rate and a much smaller weight to the interest rate, which suited a small open economy especially sensitive to variations in the relative value of its currency.

Frochen (1996) constructed MCIs for five European countries for the period from 1987 to 1995, with series covering the effective exchange rate and nominal short-term and long-term interest rates. The indicators showed that monetary policy might have had a stabilising influence on the comparable price level in France and Germany since 1990. These effects however, were fairly moderate in

Table 1: Select Relative Weights for MCI

	Central Bank	IMF	OECD	Deutcshe Bank	Goldman Sachs	JP Morgan
1	2	3	4	5	6	7
Australia			2.3			4.3
Canada	3.0	4.0	2.3		4.3	2.7
France		3.0	4.0	3.4	2.1	3.5
Japan		10.0	4.0		8.8	7.9
New Zealand	2.0					
Sweden	3.0-4.0*		1.5	0.5		2.1
U.K.		3.0	4.0	14.4	5.0	2.9
U.S.A.		10.0	9.0		39.0	10.1

* : Indicates range as found in different studies.

Note : Weights are those on interest rates relative to those on exchange rates, *e.g.*, a relative weight of 3 indicates that a one percentage point increase in interest rate is equivalent to a three percentage point increase in exchange rate in terms of their impact on aggregate demand over time.

Source : Ericsson, Jansen, Kerbeshian and Nymoen (1998) and Bank of Canada (1995).

comparison with the opposite consequences of floating currencies on the economies of the United Kingdom, Italy and Spain starting in 1992. The same lack of symmetry shows up between the countries with strong currencies and those with weak currencies when the impact of monetary policy on real growth is considered.

Patra and Pattanaik (1998) attempted to develop objective indicators in terms of indices of exchange market pressure, intervention activity and monetary conditions in case of India. The weights for exchange rate and interest rates were estimated from a reduced form equation of money demand including the exchange rate impact using a sample period of April 1990 to March 1998.

In case of a small open economy like Thailand, Hataiseree (1998) emphasised that focusing on interest rate and the exchange rate may be particularly important in policy making because the exchange rate may be a primary channel through which monetary policy affects inflation and economic activity and the MCI can be used to compare the degree of importance between interest rate and the exchange rate in influencing the future inflation rate.

Jin-Lung Lin (1999) compiled MCIs for Taiwan by deriving weights for interest rate and exchange rate from a single-equation reduced-form model for GDP with specific focus on dynamic specification, nonstationarity and parameter constancy. Empirical results show that variants of MCIs are capable of indicating the monetary stance in Taiwan.

While constructing the MCI for Turkey, Kesriyeli and Kocaker (1999), derived the weights from an estimation of a price equation rather than from an aggregate demand equation because in Turkey the exchange rate is thought to be the driving force in the price adjustment process. Furthermore, the weights in the MCI were meant to reflect the 'linkage' between the operational target and the final target – inflation. The findings revealed that despite the high rate of real interest and real appreciation, which reflected the tight monetary policy as seen in the MCI figures, inflation and output growth were still at very high level. The paper stressed that increases in price

levels and the output growth should not be interpreted as the result of the monetary policy implemented by the central bank. Under such conditions, the central bank has adopted a relatively tight monetary policy since 1997, as indicated by the MCI, but this was not enough to cool down the economy because of general expansionary policies.

Gerlach and Smets (2000) derived a theoretical model to show that the optimal feedback rule of a central bank can be written in terms of an MCI, *i.e.*, the central bank can optimise its objective function by setting a weighted average of interest rates and exchange rates according to macroeconomic conditions.

Peng and Leung (2005) estimated MCIs for mainland China for assessing its monetary and financial conditions, by extending the conventional MCI – a weighted sum of real interest rates and the real effective exchange rate – to capture the credit availability effect, as bank credit was viewed as an important channel through which China's monetary policy is implemented. The MCI suggests a distinct easing of monetary conditions in 2002-03, reflecting a weaker US dollar, a relaxed lending policy by banks and an easing of deflation, which reduced the real interest rate thereby facilitating faster economic growth. However, macroeconomic measures to curb credit supply and raise interest rates in 2004 resulted in tighter monetary conditions. This was marked by a considerable rise in the MCI, which indicated a reversal of about half of the earlier easing.

Hyder and Khan (2006) constructed MCI for Pakistan using the Johansen's cointegration techniques and pointed out eight tight and six soft periods of monetary stance during March 1991 to April 2006 in case of Pakistan. The paper noted that though the scope of its use as an operational tool is limited, MCI can serve as an important indicator of monetary policy stance in case of Pakistan, if used with caution alongside other indicators.

The review of literature and cross country experiences reveal that MCI had been used by central banks basically as an indicator for monetary conditions as well as short- and intermediate-run operational monetary target, with the weights aiming to reflect the relative impact

of interest rates and exchange rates on aggregate demand or inflation. It could be seen from the literature that although it is possible to construct a weighted indicator relating to growth or inflation, there is widespread use of growth equations for the calibration of relative weights of MCI components.

Although MCIs expressed relative to a base period are relatively simple to calculate and appear to have intuitive appeal as measures of the stance of monetary policy in an open economy, they have been criticised both on their conceptual and empirical foundations [see among others, Eika, Ericsson and Nymoen (1996); Ericsson *et al* (1998); and Stevens (1998)]. MCI weights cannot be observed directly, so they are usually derived empirically from a model of the economy. Thus, MCI measures typically depend on the assumptions made to estimate them (including parameter constancy, cointegration, dynamics, exogeneity, estimation uncertainty and the choice of variables), and hence are model-specific. The MCI is a convex combination of an asset price and a rate of return, which may affect goal variables of monetary policy at different speeds. Thus, the responses of such goal variables to changes in the MCI will differ according to which component has changed. Different types of shocks have different implications for monetary policy. By construction, an MCI complicates the identification of exchange rate shocks because this requires focusing on movements in the exchange rate and interest rates separately, rather than aggregated together. Taken together, these factors may explain why the use of MCIs as operating targets has sometimes created difficulties. The analytical foundation of the MCI has been criticised on the ground that while the interest rate is exogeneous, the exchange rate is endogeneous and, therefore, these two variables should not be considered as substitutes in the way they are interpreted under MCI (King, 1997). Therefore, the movements in the MCI are required to be interpreted with caution. Although the frequency of outliers often tend to be less for MCI than for its constituent parts, an uni-dimensional pursuit of the MCI could easily lead to a “myopic” monetary policy, especially in the face of short-run shifts in market sentiment that do not affect fundamentals.

The early adopters of MCI, such as the Bank of Canada and the RBNZ, for instance, faced certain problems in continuing with MCI as operating targets. First, often market participants were inclined to take MCI as a precise short-term policy target. The Bank of Canada had to clarify that the MCI should not be treated as a narrow, precise measure, and it began to use the term "policy guide" to discourage the market to consider it as the operational target. Second, in view of the very construction of MCI, there were tendencies on the part of the market participants to treat all exchange rate movements as portfolio shocks with expectations of offsetting interest rate adjustment on the part of the central bank. On the contrary, the Bank of Canada, in fact, had to judge the source of the exchange rate shock and its persistence in order to decide its policy responses.

The MCI was particularly successful in Canada in the first half of the 1990s due to the dominance of portfolio adjustment shocks to its curreny. In the second half of the 1990s, however, real shocks on the Canadian currency were more common and, hence, offsetting interest rate responses were perceived to be unwarranted by the central bank. Accordingly, the Bank of Canada, since 1998, dropped the use MCI as the operational target. However, the Bank continued to reckon the importance of "monetary conditions" in describing its policy stance and its communication with the financial markets.

The RBNZ used to take a stance on the level of monetary conditions but did not take a view on desirable mix of interest rate and exchange rate, as it was believed that both rates could not be determined simultaneously in an open economy. The RBNZ, which initially used to announce the future path of MCI, eventually moved away from the practice since March 1999 as the use of tight indicative bands increased the day-to-day and week-to-week volatility of interest rates and did not allow sufficiently for the range and scale of events that had an impact on the New Zealand economy. However, the MCI continued to play an important role as a summary indictor of monetary conditions in monetary policy formulation at the RBNZ.

In general, with increasing trade openness and large cross-border capital flows across the globe since the second half of the 1990s, the

increased dominance of real shocks to the exchange rate made it near-impossible for the central banks to project a desired path of MCI, thereby, reducing its effectiveness as an operating target. However, most of these central banks continued to reckon MCI as a useful indicator of monetary conditions. Cross-country experiences show that MCI is used by those countries which have been targeting short-term interest rates and the exchange rate as part of their intermediate targets of monetary policy. In fact, given the high degree of openness (as measured by the value of trade as proportion of GDP) of these economies, monitoring MCI is one possible way of incorporating the exchange rate directly into the framework of monetary policy. Technically, therefore, the greater the openness of an economy, the higher would be the weight of the exchange rate relative to that of the interest rate. This is particularly important in the context of a flexible exchange rate policy and growing internationalisation of economies where both interest rates and the exchange rate play a critical role in the transmission mechanism of monetary policy.

In India, in view of continuous development and integration of financial markets – both domestically and with the global economy – the role of exchange rate and interest rates in influencing monetary conditions has increased to a great extent in the recent past. With the increasing role of such rate variables in transmitting monetary policy, MCI may provide additional summary information on monetary conditions and qualify as a useful indicator under the multiple indicator approach adopted by the Reserve Bank of India (RBI) since 1998. The next Section of this paper attempts to construct MCIs for India – first, a traditional "narrow" MCI incorporating only interest rate and exchange rate and, thereafter, a "broad" MCI which uses credit as an additional variable along with interest rate and exchange rate.

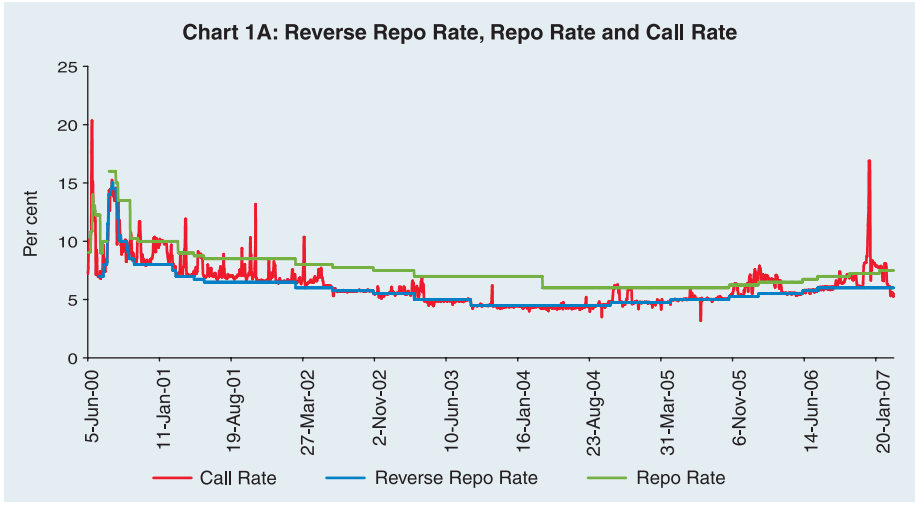
IV. Monetary Conditions Index for India

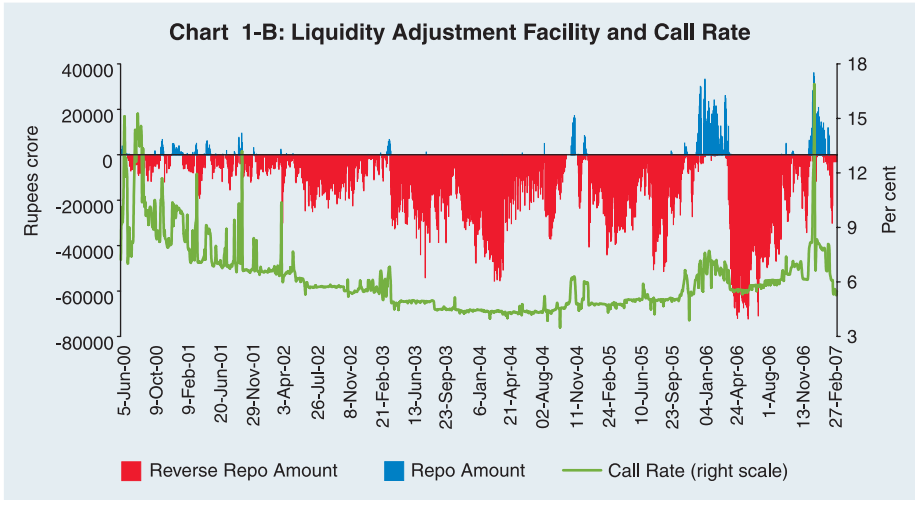
The purpose of constructing an MCI for India is to assess the efficacy of the conduct of monetary policy by recognising the evolving

importance of the various monetary transmission channels. Like many other EMEs, monetary policy in India has also witnessed significant changes in its operating procedures and instruments in the recent past. For instance, the conduct of Indian monetary policy had to face the challenges posed by the transition from a quantum to a rate channel of monetary transmission following financial liberalisation during the 1990s. The RBI's Working Group on Money Supply (Chairman: Dr. Y.V. Reddy) pointed out that monetary policy exclusively based on money demand could lack precision (RBI, 1998). As a result while money supply continued to serve as an important information variable, the RBI felt it necessary to monitor a set of additional indicators for monetary policy formulation. Accordingly, the RBI adopted a multiple indicator approach from 1998 wherein, besides monetary aggregates, information pertaining to a range of rates of return in different financial market segments along with the movements in currency, credit, the fiscal position, merchandise trade, capital flows, the inflation rate, the exchange rate, refinancing and transactions in foreign exchange – which are available on a high frequency basis – were juxtaposed with data on output and the real sector activity for drawing policy perspectives. It is widely perceived that, though the medium- to long-term impact of money supply on inflation cannot be ignored for the purposes of monetary policy, the transition to a multiple indicator approach had been a logical outcome of monetary policy reforms in India, which provided the necessary flexibility to the RBI to respond more effectively to the changes in domestic and international economic and financial market conditions. Under this approach, the role of monetary aggregates as the exclusive intermediate target have been de-emphasised and short-term policy interest rates have gradually emerged as the operating target of monetary policy in contrast to the earlier reliance on reserve requirements and credit ceilings/sectoral allocation of credit. Within the multiple goals assigned to the monetary authority, the achievement of price and financial stability received greater emphasis. The overall objective has been approached in a flexible and time variant manner with a continuous rebalancing of priority between growth and price stability, depending on the underlying macroeconomic and financial conditions.

Consistent with the structural changes in the monetary policy framework, a greater degree of emphasis was placed on developing multiple rate-based channels of monetary transmission and to enhance policy effectiveness. Accordingly, the RBI simultaneously undertook the development of the domestic financial market spectrum, sequenced into the process of deregulation of interest rates, the withdrawal of statutory pre-emptions, the qualitative improvement in monetary-fiscal coordination and the progressive liberalisation of the exchange and payments regime, including institutionalising a market oriented exchange rate policy since the early 1990s. These efforts enabled a shift from direct instruments of monetary control to indirect instruments in consonance with the increasing market orientation of the economy enabling the RBI to influence short-term interest rates by modulating the liquidity in the system through the Liquidity Adjustment Facility (LAF) operations (Chart 1).

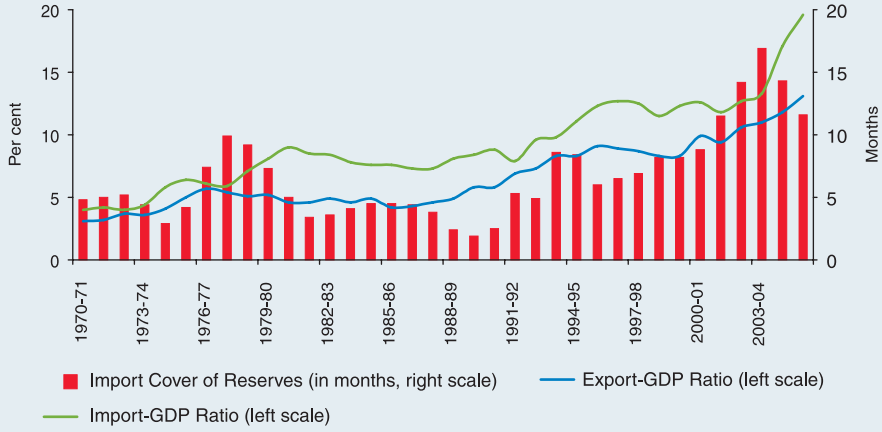
Apart from development in domestic financial markets, since the early 1990s the Indian economy witnessed a significant boost to external trade and capital flows enabled by a progressive liberalisation of the exchange and payments regime. The transition to market determined exchange rate of rupee took place in two stages. The liberalised exchange rate system (LERMS) instituted in March 1992 was a dual exchange rate arrangement under which 40 per cent of the current receipts were required to be surrendered to the Reserve Bank at official exchange rate while the rest 60 per cent could be converted at market rate. The unified market exchange rate regime replaced the dual exchange rate regime in March 1993 and since then the objective of exchange rate management in India has been to ensure that external value of the rupee is realistic and credible while reducing excess volatility in the short run and to help maintain adequate level of reserves. Exchange rate management is, thus, flexible without fixed or pre-announced targets or bands, with interventions primarily to ensure orderly market conditions. Quantitative restrictions on merchandise trade have been abolished and tariffs are progressively being brought down to international levels. Payments restrictions on





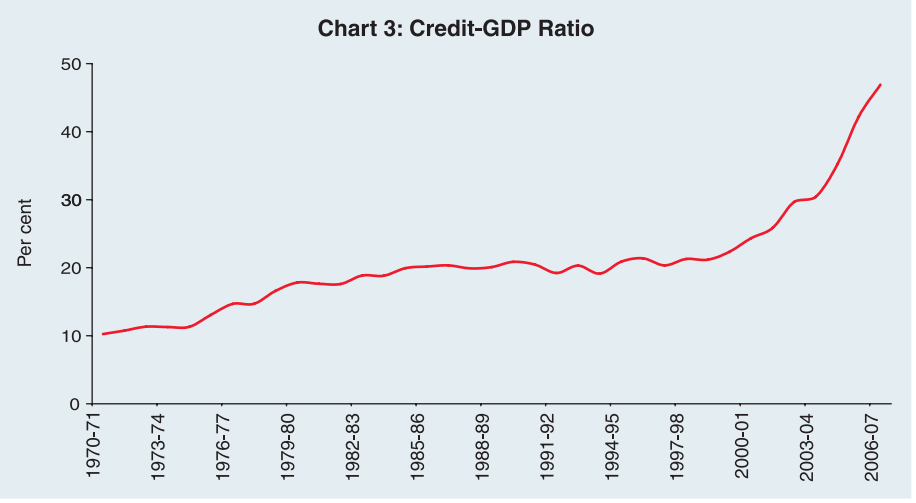
all current account transactions have been removed. A cautious and calibrated policy has been pursued for management of capital account liberalisation. The sequence and pace of liberalising capital transactions has been determined by the strength of the macro-economic fundamentals and by the evolving international environment (RBI, 2004). Accordingly, with the phased opening up of the Indian economy to external flows and increasing trade openness, the role of the exchange rate in the transmission mechanism has also assumed greater importance in recent years (Chart 2).

Chart 2: Trade Openness and Import Cover - India



With the gaining prominence and success of the rate channels in transmitting policy signals, several measures were undertaken to strengthen the process of price discovery in the financial markets leading to higher degree of market integration and continued financial deepening. However, the pass-through of the policy signals through the rate channels alone have been inhibited by certain structural rigidities still persisting in the systems of a developing economy. In the absence of fully developed and integrated financial markets, thus, quantitative variables like bank credit continued to play an important role in the Indian context (Chart 3). Thus, even with the gaining importance of short-term interest rates and exchange rates, monetary policy continued to aim at influencing aggregate demand by altering the quantum and availability of credit along with changes in the price of credit. In general, it may be held that in less developed financial markets, by using direct monetary instruments in conjunction with market-based instruments, the overall policy effectiveness can be improved. Thus, quantitative variables, although diminishing in importance, still play an important role in the monetary transmission mechanism in India.

Accordingly, in the Indian context, along with constructing a conventional MCI using only rate variables, it may be worth incorporating quantitative variables like credit also in the construction



of MCI. We now proceed to construct the indices for India and see what forms they take and what important information they provide for an objective analysis of monetary policy.

The Model

We have attempted to estimate a quarterly aggregate demand equation for deriving the relative weights of the components of MCI, *i.e.*, real interest rate and real exchange rate. In deriving the relative importance of components of an MCI, inflation rate or output gap is commonly used in the literature as the dependent variable in the reduced form equation. In this study, however, the relative weights of the component variables in the narrow MCI are calibrated by estimating an aggregate demand equation using output growth (real GDP growth) instead of output gap as the dependent variable, because of the difficulties in estimating potential output due to the structural changes and liberalisation underway in India and also because of the presence of various price controls. Moreover, the conventional methods such as HP filter may not be appropriate in deriving potential GDP in our case because of the small sample period (1996 Q_2 to 2007 Q_1).

It may be observed that MCI is sensitive to the choice of the interest rate. In the Indian context, while policy rates give the signals, it is through the overnight call money rate that the market forms expectation

about the policy stance. Accordingly, call rate is the most vibrant rate in the money market. Moreover, the call rate is preferred by the policy makers also over the alternative market-related short-term interest rates (*e.g.*, Treasury Bills rate, CP rate or secondary market G-Sec yield) in order to decide on the extent and timing of intervention in the money market. In the absence of a continuous term structure of money market interest rates (constraints such as time buckets and underdeveloped CP market) call rate emerged as the preferred choice in case of India.

The construction of the narrow MCI implicitly assumes a reasonable degree of flexibility in the underlying exchange rate over time. In the Indian context, although the RBI at times intervenes in the foreign exchange market, it does not intervene with a pre-determined target for the exchange rate. It allows the exchange rate to move over time in line with the macro-economic fundamentals. The RBI's intervention is essentially to curb excess volatility in the short-run and in order to ensure stability in the market. The recent phase of strong appreciation of the Indian Rupee and the RBI's non-intervention provide us additional support in this regard for construction of the MCI.

While constructing the MCI, a number of issues are important. First, as MCI assumes an underlying model linking GDP or inflation to interest rates, exchange rate and other variables to obtain valid inference on the key parameters and the resulting MCI, the dynamics of the model should be correctly specified. Second, the possible existence of unit roots and cointegration should be taken into account in testing the parameter significance and interpreting parameters. The assumption of parameter constancy is essential for proper parameter estimate and should be examined. Finally, the issue of omitted variables needs to be examined as it could lead to biased parameter estimate. The following steps have been followed to deal with such issues in this paper.

First, for the purpose of estimation, the generalised aggregate demand equation takes the following form.

$$y_t = \alpha + \beta_1 y_{t-1} + \beta_2 y_{t-2} + \ldots + \beta_p y_{t-p} + \theta_1 r_{t-1} + \theta_2 r_{t-2} + \ldots + \theta_p r_{t-p} + \lambda_1 e_{t-1} + \lambda_2 e_{t-2} + \ldots + \lambda_p e_{t-p} + \psi_1 c_{t-1} + \psi_2 c_{t-2} + \ldots + \psi_p c_{t-p} + \epsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where y is real GDP growth rate, r is the real interest rate, e is real effective exchange rate, c is real credit growth rate and € is the residual term.

In our estimation, aggregate demand is represented by the real GDP growth (excluding agricultural and allied activities, and community, personal and social services) in per cent (NANCGDPGP). Agriculture and allied activities and community, personal and social services have been excluded as they are relatively less sensitive to movements in interest rates and exchange rates. Interest rate is represented by inflation-adjusted call money rate in per cent (RCALLP), while real exchange rate is being captured by the deviation of the logarithm of the 36-country trade-based REER of the Indian rupee from its base value of 100 (ZLREER). The sample period is restricted to 1996Q2 to 2007Q1 because of non-availability of quarterly GDP data prior to 1996.

Second, we examine the issue of possible non-stationarity in the data. We test for presence of unit root for the series under investigation. The call rate, REER and credit growth turn out to be stationary at 5 per cent level of significance[1]. Although the real GDP growth series exhibits non-stationarity in general, the presence of a clear upward trend from the third quarter of 2001 suggests trend-stationarity. Accordingly, a trend-dummy for GDP has been introduced from 2001Q3 onwards denoted by GDPDUM.

Third, we carefully specify the dynamics of the model by incorporating appropriate lags of the dependent variable as well as the set of explanatory variables. Various types of diagnostic checking methods are employed to check if there is remaining correlation among the residuals such as the Ljung-Box Q-statistic test.

Under this freamework, narrow MCI can now be constructed as a weighted sum of deviations of interest rate and exchange rate from the base period as:

$$\text{Narrow MCI}_t = w_r (r_t - r_0) + w_e (e_t - e_0) \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where t = 0 is the base period (in our case 1997Q2) and w_r and w_e are the weights derived from the estimated coefficients of real

interest rate and real exchange rate from the generalised aggregate demand equation.

In the generalised equation as specified above, the sign of θs is expected to be negative since increase in interest rate lowers aggregate demand. The sign of λs is also expected to be negative as by definition an increase in REER signifies an appreciation of the Indian Rupee and, hence, *ceteris paribus*, dampen aggregate demand. Our estimate for the generalised aggregate demand equation (ignoring credit) is as follows, which exhibits expected signs for all the co-efficients and turned out to be significant.

$$\begin{aligned} NANCGDPGP = {} & 0.02 + 0.73\ NANCGDPGP(-1) - 0.15\ RCALLP(-4) - \\ & (2.56)^{**} \quad (8.52)^{*} \qquad\qquad (-2.34)^{**} \\ & 0.11\ ZLREER(-3) + 0.01\ GDPDUM \\ & (-2.04)^{**} \qquad (2.74)^{*} \end{aligned}$$

$\bar{R}^2 = 0.84$ and Durbin's h = -0.52 ……. (3)

Since multiplying a constant to MCI does not change the index in any material way, it is the ratio of λ/θ that is critical in computing MCI, which can be derived from our estimated equation (3) as 0.73 (= 0.11 / 0.15). The estimated coefficients suggest the weights for interest rate (w_r) and exchange rates (w_e) to be 0.58 and 0.42, respectively.

Thus, for simple economic interpretation, the MCI equation (2) can also be written as:

$$\text{Narrow MCI}_t = (r_t - r_0) + \lambda/\theta\ (e_t - e_0) \qquad \text{……..(4)}$$

where λ/θ gives the relative importance of exchange rate *vis-à-vis* the interest rate. Thus, our estimation result shows that one percentage point rise in real interest rate as equivalent to 1.36 (= 1/ 0.73) percentage point increase in REER (appreciation).

In order to further improve model specifications, we tried to include such a variable that was complementary to the price variables as far as the policy pronouncements are concerned for capturing the

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* : Figures in parentheses are t-statistics – significant at 1 per cent level.

** : t-statistics – significant at 5 per cent level.

effect of any other possible transmission channel on the real macroeconomic variables. The literature shows that the credit stance of banks has important supplementary effects on monetary policy transmission (Bernanke and Gertler, 1995). This is important for India as banks continue to play a dominant role in financial intermediation. Moreover, policy emphasis on bank credit expansion remains an important tool for monetary policy implementation, as shown by the continuing monetary policy emphasis on priority sector lending and credit delivery mechanism and modulating prudential measures and provisioning requirements on bank exposures to specific sectors.

Accordingly, the study extends the conventional MCI to capture the credit availability effect on the real economy by taking into account bank credit also as an explanatory variable in the estimation of the reduced form equation (1). Bank credit is captured by the real (inflation-adjusted) growth rate of non-food credit extended by the scheduled commercial banks in per cent (RNFCGP)[2].

Accordingly, for "broad" MCI the estimated equation is as follows:

$$\begin{aligned} NANCGDPGP = {} & 0.02 + \underset{(3.03)^*}{0.61}\ NANCGDPGP(-1) - \underset{(-2.86)^*}{0.18}\ RCALLP(-4) - \\ & \underset{(-2.39)^{**}}{0.13}\ ZLREER(-3) + \underset{(2.28)^{**}}{0.06}\ RNFCGP(-4) + \underset{(2.80)^{*}}{0.01}\ GDPDUM \end{aligned}$$

$\bar{R}^2 = 0.86$ and Durbin's h = 0.28 …….. (5)

In this equation also the signs of the co-efficients of interest rate and exchange rate are expected to be negative and the sign of ψ, the co-efficient of credit, is expected to be positive as increase in credit would, *ceteris paribus,* increase aggregate demand. Our estimates for equation (1) yield expected signs for all the co-efficients and turned out to be significant. The inclusion of credit did not distort the expected sign and significance of the other two variables, rather it improved the fit.

Thus, in line with equation (4), the "broad" MCI can be represented as:

$$\text{Broad MCI}_t = (r_t - r_0) + \lambda/\theta\,(e_t - e_0) + \Psi/\theta\,(c_t - c_0) \quad \text{…….(6)}$$

where $\lambda/\theta = 0.72$ (=0.13/0.18) and $\Psi/\theta = -0.33$ [= (-) (0.06/0.18)].

---

* : t-statistics – significant at 1 per cent level.

** : t-statistics – significant at 5 per cent level.

The estimated coefficients for broad MCI suggest the weights for interest rate, exchange rate and bank credit to be 0.73 and 0.51, and (-) 0.24, respectively. The ratios now need careful interpretation in view of an additional explanatory variable, *i.e.*, bank credit. The ratio of the estimated coefficients suggest that a one percentage point rise in real interest rate is, *ceteris paribus*, equivalent to 1.39 percentage point rise in REER or a 3.03 percentage point decline in real credit growth. Although the two measures of MCI broadly co-move, the extent differs at times due to difference in the relative weights of the constituent variables (Chart 4).

Chart 4-A: Narrow and Broad MCI[3]

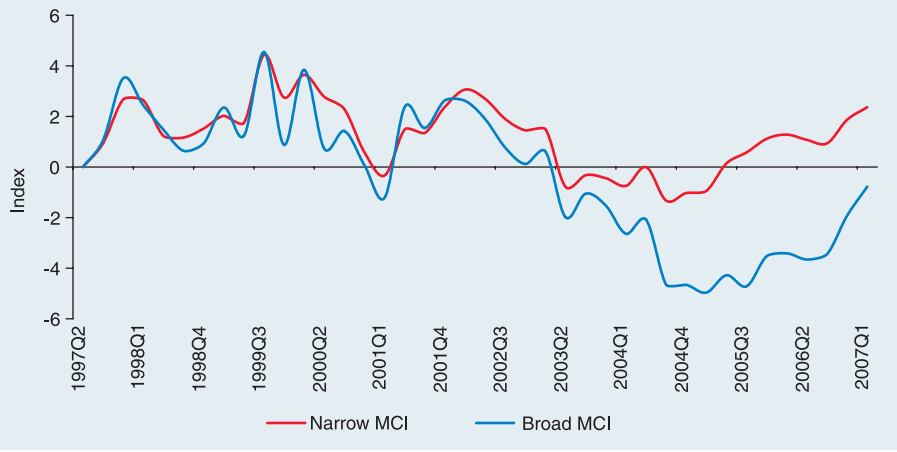
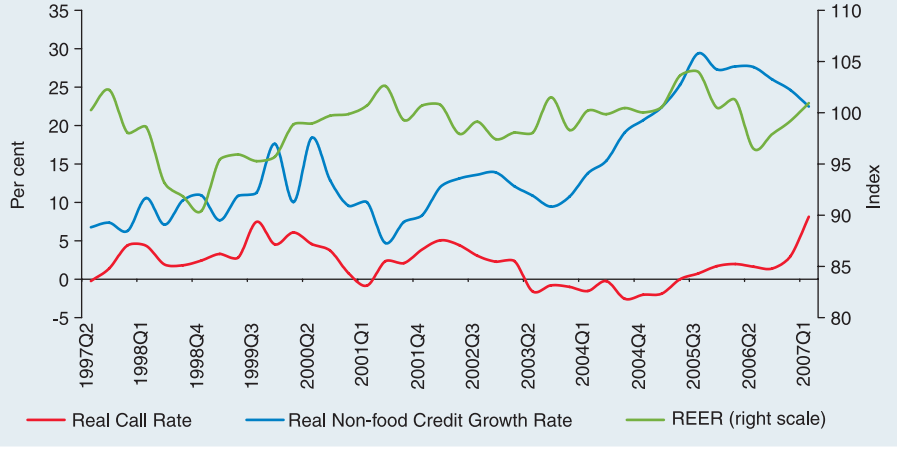


Chart 4-B: Interet Rate, Exchange Rate and Credit Growth



As noted earlier, the cointegration technique should ideally be adopted for testing the parameter significance and interpreting parameters in case of construction of the MCI. However, due to the constraints of limited number of observations/data, the cointegration technique could not be applied. Accordingly, we have estimated the equation in growth rate form and various types of diagnostic checking methods are employed to check if there is remaining correlation among the residuals. The Ljung-Box Q-statistic suggests absence of autocorrelation in the estimated residuals up to 12 lags. As the sample period became short while working on quarterly GDP growth data which is available only from $1997Q_2$, we could not run sub-sample CUSUM test and recursive regressions to investigate the issue of parameter constancy.

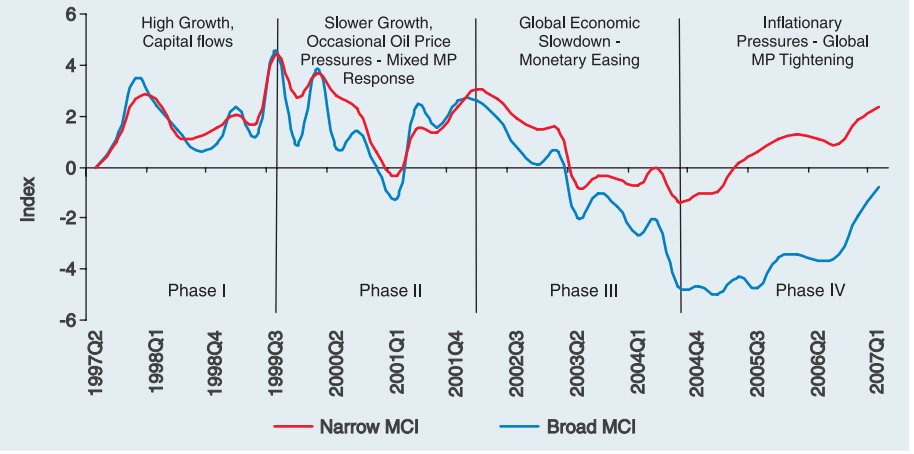
V. Results and Implication

Our estimated coefficients for narrow MCI suggest the weights for interest rate (w_r) and exchange rate (w_e) to be 0.58 and 0.42, respectively. The weights show that interest rate is relatively more important in influencing aggregate demand (58 per cent) than the exchange rate (42 per cent) during the period 1996Q2-2007Q1 and this seems to reflect the evolving dynamics of the Indian economy. This also suggests that flexibility in exchange rate and improvement in policy independence due to easing of fiscal dominance on monetary policy, along with continued policy emphasis at developing and deepening the financial markets in tandem with the deregulation of interest rates have enabled the emergence of interest rate as the main channel of monetary policy transmission in India. In a globalised environment, the higher weight for interest rate is also justified as interest rate modulations are integral parts of maintaining orderly conditions in financial markets, including the foreign exchange market. This is also in line with the increased convergence of operating procedures of monetary policy across countries.

The monetary conditions so derived appears to explain the setting of monetary policy better when correlated with past economic events than that is explained by either interest rate or

exchange rate independently and can be explained with the help of a phase-wise analysis of the movements in MCI (Chart 5). Economic liberalisation led to years of high growth during the latter half of the 1990s. The increase in MCI during this period emanated mostly from increases in interest rates. The phase of 1999-2002 was, on the contrary, a period of relatively subdued economic activity for India along with occasional oil price pressures. Accordingly, monetary policy response during this phase had to balance the concerns of supporting growth and mitigating the possibilities of a rise in inflation and inflationary expectations. Interest rates started stabilising with the gradual developments of the financial markets and the RBI's liquidity management operations gaining greater precision. Real exchange rate, as depicted by the multi-country REER, followed an appreciating trajectory with larger capital inflows. The two-way movement of MCI during this phase reflected the counter-balancing movements of its constituents. The concerns of global economic slowdown since 2001 prompted many central banks to aggressively pursue an accommodative monetary policy. In India, following the significant deceleration in economic growth, the RBI also resorted to monetary easing since June 2002, which facilitated the process of economic recovery and can be traced in the easing of the MCI till September 2004. The continued

Chart 5: Monetary Conditions in India



pursuance of accommodative monetary policy all over the globe helped reviving growth – world economic growth reached a high of over 5 per cent in 2004. The resultant demand pressures along with rising crude oil and other commodity prices fuelled inflationary spirals warranting several central banks, including the RBI, to pursue pre-emptive monetary tightening since September 2004. This phase of monetary tightening, in the Indian context, is also captured better by MCI compared to the trends in monetary aggregates or interest rates alone.

The inclusion of credit as another policy variable in the broad MCI needs careful interpretation. The estimated coefficients for broad MCI suggest the weights for interest rate, exchange rate and bank credit to be 0.73 and 0.51, and (-) 0.24, respectively. As bank credit is positively associated with aggregate demand, the importance of both the rate variables on aggregate demand is estimated to have increased because of their offsetting impact when judged along with credit. However, in view of pro-cyclicality in credit and counter-cyclical role of policy interest rate, the tightening or easing of monetary policy becomes a complex combination of the impact of the two forces. As such, the broad MCI behaves in a similar fashion like the narrow MCI and, in fact, better explains the extent of monetary easing during June 2002-September 2004 and the current phase of monetary tightening thereafter than what is suggested by money supply growth and narrow MCI. While the sharp growth in broad money since 2005Q1 implied monetary easing, the movement of MCI, in fact, suggests tightening of overall monetary conditions led by the continuous hikes in policy interest rates since October 2004 (Chart 6). Consequently, inflation which showed signs of deceleration by end-March 2005, eased further during 2005-06 reflecting simultaneous increases in policy rates as well as various prudential measures aimed at controlling credit to certain sectors of the economy. This along with the fiscal measures helped to contain inflationary expectations in view of higher international crude oil prices. The firming up of inflation and inflationary expectations during 2006-07 led to further policy-induced tightening of monetary conditions.

Chart 6-A: MCI and Broad Money Growth

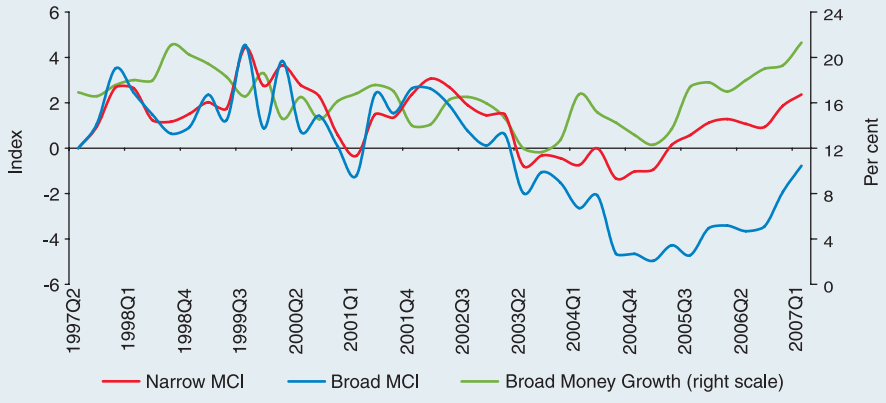


Chart 6-B: MCI and GDP Growth

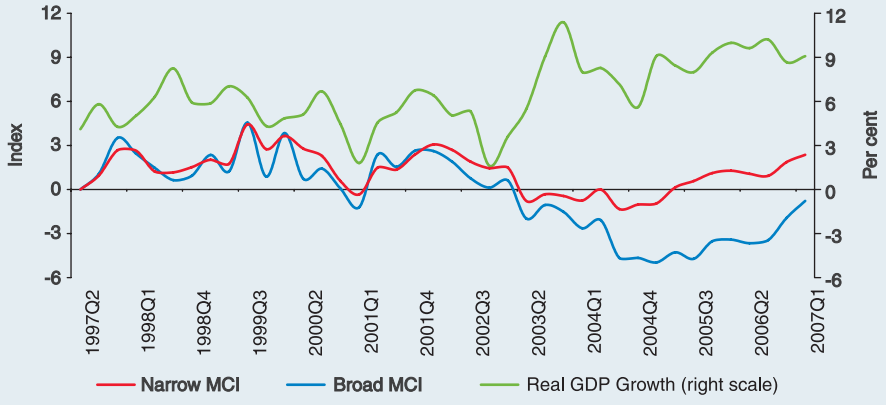
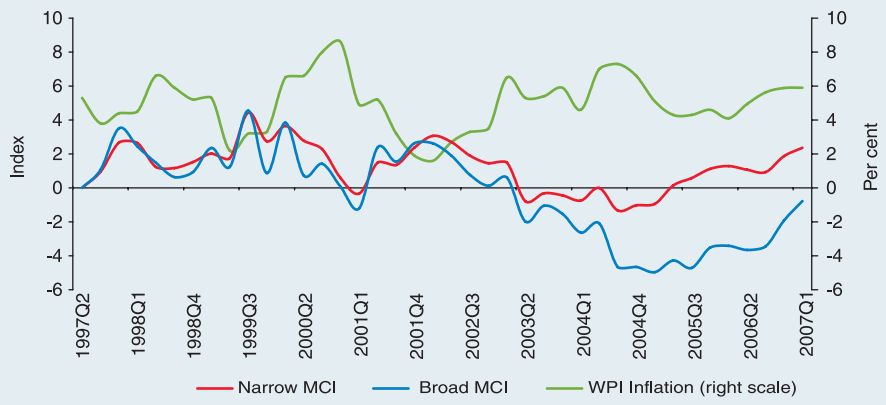


Chart 6-C: MCI and Inflation



VI. Conclusion

The MCI, *per se*, is not an answer to the age-old debate regarding the conflict of objectives of monetary policy. It is, however, effective to put together more than one indicator in order to have a better assessment of the stance of monetary policy. It is actually possible to find phases when just by tracking the movements of one variable one may commit a mistake to conclude that there is a tightening (or easing) of policy unless the more-than-compensating counter-movements in the other variables are taken into account. In that context, as MCI systematically takes into account both (and even credit, in case of broad MCI) there is no room for missing such counter-movements.

This paper demonstrates that monetary policy in India is transmitted through various channels such as interest rates, exchange rates and credit and therefore combining the impact of various channels in the MCI could improve the information content and help to explain better the responses of monetary policy to the actual outturn of economic events. In view of gaining importance of exchange rate channel of monetary transmission in India, the interest rates are more aligned with the international interest rates in the last few years. On the other hand, while on its own bank credit adds to aggregate demand in the economy, the fuller impact is partly offset by the countercyclical movement in policy interest rates, thereby fine tuning the overall monetary conditions consistent with the evolving macroeconomic environment. As output appears to respond relatively quickly compared to inflation to changes in monetary policy setting, MCI and GDP growth appears to be linked more closely as compared to MCI and inflation, although the direction of change in MCI appears to be consistent with the objectives of both growth and price stability. The movement in MCI reveals its role as a leading indicator of economic activity and inflation in India when properly interpreted with the lagged responses of these variables to policy signals. MCI, thus, provides more information about the policy stance than what is revealed by either interest rates, exchange rates or credit independently. Accordingly, our findings underscore the potential of MCI as a valuable indicator of monetary policy in India under the existing multiple indicator approach.

Note

1 Using the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test statistic (with Newey-West bandwidth using Bartlett kernel).

2 The credit data series has been duly adjusted for the impact of the merger (ICICI) and conversion (IDBI) in the banking system and quarter-end and year-end aberrations in the recent past.

3 Narrow and broad MCIs for 2007 Q1 are based on the call rate series that exclude the three outliers when the call rate crossed 50 per cent during March 2007.

References

Bank of Canada (1995), *Monetary Policy Report*, May.

Bernanke, Ben. S. and Mark Gertler (1995), "Inside the Black Box: The Credit Channel of Monetary Policy Transmission", *Journal of Economic Perspectives*, Volume 9, Number 4.

Cecchetti, S. (2006), "Sources of Central Bankers' Influence over the Economy", Paper presented at the Central Bank Governors' symposium at the Bank of England, June.

Duguay, P. (1994), "Emprical Evidence on the Strength of the Monetary Transmission Mechanism in Canada: An Aggregate Approach" *Journal of Monetary Economics*, Vol.33 (1), pp. 39-61.

Eika, Kari H., Neil R. Ericsson and Ragnar Nymoen (1996), "Hazards in Implementing a Monetary Conditions Index", *Oxford Bulletin of Economics and Statistics*, Vol 58, No.4.

Ericsson, N. R., E.S. Jansen, N. A. Kerbeshian, and R. Nymoen (1998), "Interpreting a Monetary Conditions Index in Economie Policy", *BIS Conference Papers*, Vol.6, pp. 237-254.

Freedman, C. (1994), "The Use of Indicators and of the Monetary Conditions Index in Canada", in Balino, T.J.T. and Cottarelli, C.(eds), Frameworks for Monetary Stability: Policy Issues and Country Experiences, pp. 458-476.

Frochen, P. (1996), "Monetary Conditions Indices", *Banque de France Bulletin Digest*, No 31, July.

Gerlach, Stefan and Frank Smets (2000), "MCIs and Monetary Policy", *European Economic Review (44/2000)*.

Hanson, B. and H. Lindberg (1994), "Monetary Conditions Index - A Monetary Policy Indicator", *Quarterly Review, Sveriges Riksbank*, Vol. 3, pp. 12-17.

Hataiseree, Rungsun (1998), "The Roles of Monetary Conditions and the Monetary Conditions Index in the Conduct of Monetary Policy: The Case of Thailand under the Floating Rate Regime", *Bank of Thailand Quarterly Bulletin*, September.

Hyder, Zulfikar and Muhammad Mazhar Khan (2006), "Monetary Conditions Index for Pakistan", *State Bank of Pakistan Working Paper No. 11/06*, May.

Jin-Lung Lin (1999), "Monetary Condition Index in Taiwan", Institute of Economics, Academia Sinia, August.

Kesriyeli M. and I. Ilhan Kocaker (1999), "Monetary Condition Index : A Monetary Policy Indicator for Turkey", *Discussion Paper No. 9908*, Central Bank of Republic of Turkey.

King, M. (1997), "Monetary Policy and the Exchange Rate", *Quarterly Bulletin*, Bank of England, pp. 225-227.

Patra, Michael Debabrata and Sitikantha Pattanaik (1998), "Exchange Rate Management in India: An Empirical Evaluation", *RBI Occasional Papers*, September.

Peng, W. and F. Leung (2005), "A Monetary Conditions Index for Mainland China", *Hong Kong Monetary Authority Quarterly Bulletin*, June.

Reserve Bank of India (1998), "Monetary Conditions Index", *Annual Report*, 1997-98.

Reserve Bank of India (1998), *Report of the Working Group on Money Supply: Analytics and Methodology of Compilation* (Chairman: Dr. Y.V. Reddy).

Reserve Bank of India (2004), *Report on Currency and Finance 2002-03*.

Reserve Bank of New Zealand (1996), "Summary Indicators of Monetary Conditions", *Reserve Bank of New Zealand Bulletin*, 59(3), pp 223-228.

Stevens, G.R. (1998), "Pitfalls in the Use of Monetary Conditions Indexes", *Reserve Bank of Australia Bulletin*, August.

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A Review of Trends in Banking Indicators in North Eastern Region of India

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This paper reviews whether the rapid growth in banking indicators in the North Eastern region of India following nationalisation of 14 major banks in 1969 and another six in 1980 based on social banking was sustained or not. It finds a phenomenon of retarding trend in almost all the banking parameters in the region since the beginning of the 1990s. It then attempts to reason out the impediments typically affecting the region, which has given rise to such a situation and makes a number of suggestions that would enhance the financial intermediary role of scheduled commercial banks in the region.

JEL Classification : G21

Keywords : Scheduled Commercial Banks, Credit, Deposit, Branch Network

Introduction

Modern banking in some of the north eastern states is only a post-nationalisation phenomenon since 1969. As on June 1969, not a single branch of scheduled commercial banks (SCBs) existed in Arunachal Pradesh and Mizoram, a situation akin to only some pockets like island Union Territories of Dadra and Nagar Haveli and Lakshadweep at that time. Only two branches each of SCBs served the entire State in Manipur and Nagaland on that date, while as late as June 1975, only one SCB branch served the entire State of Mizoram. Assam with a longer history of tea and oil industry was better served by banks among the States in the region.

This low level of banking development had much to do with the socio-economic and geographical reasons. Except the plain areas of Assam and Barak Valley (Assam), Tripura Valley and Imphal Valley, the rest are hilly States inhabited by more than one hundred different

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tribes each one differing in terms of dialect, traditions and other social features. A much larger percentage of population live in the rural areas, which was as high as 85.0 per cent as per 2001 census as compared to the national average of 72.0 per cent, while it was over 90.0 per cent in 1971, as compared to the national average of 80.0 per cent. Besides factors leading to inaccessibility such as poor transport and communication network in hilly terrains with sparse settlement of population, the subsistence nature of a traditional tribal economy has limited the demand for modern financial services. Furthermore, the typical financial institutions have neither customised the types of financial services they provide to the indigenous inhabitants nor innovated to suit the local demands.

Is the low level of economic development in the region due to low level of banking penetration? Since the influential works of McKinnon (1973) and Shaw (1973), showing the positive correlation between financial intermediation and economic growth, a number of studies have attempted to investigate the relative importance of financial intermediation among the determinants of growth. Many of them have assigned a greater role to financial intermediation than other determinants in the process of economic growth (Gorton and Winton, 2002; Boyreau-Debray, 2001; Levine, 1997; and Levine *et al,* 1999). While financial intermediation and economic growth are correlated, does the former cause the latter or the *vice versa* that the demand factors are equally important? This is an unsettled issue, though a number of studies have found that financial development lead to economic growth in a supply leading sequence (King and Levine, 1993; Benhabib and Spigel, 2000).

For the region typified by large infrastructural bottlenecks, was the expansion of modern banking system based on social banking since the nationalisation of major banks in 1969 sustainable? It has been highlighted that though financial intermediation in supply leading framework leads to economic development, without real sector development in terms of physical infrastructure and improvement in supply elasticities, the financial sector can even

misallocate resources, potentially generate bubbles and possibly amplify risks (Reddy, 2006). At the same time, provision of physical infrastructure, particularly in the rural areas, is equally important for generation of demand for financial services. This is so as improvements in availability of electricity, roads and telecommunications, warehouses in rural areas would lead to better supply chain management, enhance productivity and greater value addition to agriculture (Mohan, 2006). The unique socio-economic conditions and culture of the region would also warrant that without financial innovations to suit local demand conditions the process may not be sustained.

Thus, the paper analyses the trend in some select banking indicators capturing the extent of financial intermediation by the scheduled commercial banks in the region *vis-à-vis* the national pattern and at the same time brings out the divergence among the States. These banking parameters are: branch network, the percentage of adult population resorting to banking transactions, credit and deposit growth, level of per capita deposit and credit, the proportion of deposit and credit in state domestic product, credit-deposit ratio, and sectoral deployment of credit. It then attempts to reason out the cause for the observed trend and list out the impediments required to be removed.

The rest of the paper is organised as follows. Section II analyses the trend in the various banking indicators. In section III, an attempt is made to provide explanation for the observed trend and find out the various impediments to flow of credit in the region. Summary and concluding observations are contained in section IV.

Section II: Trends in Banking Indicators

Expansion in Branch Network

Starting from a low base, during the 1970s and 1980s, branch network of scheduled commercial banks in the region expanded much more rapidly. Consequently, the average population per branch

(APPBO) in all the States declined much faster than the national level during these two decades. The APPBO in 1973 ranged from about 59 thousand (Meghalaya) to 359 thousand (Mizoram), with a regional average of over 90 thousand, as against the national average of 35 thousand. In 1981, it had declined to a range of 18 thousand (Nagaland) to 41 thousand (Mizoram) with a regional average of 32 thousand, and narrowed the gap from the national average of 18 thousand. By 1991, the regional APPBO was less than 17 thousand while the national average was 13.7 thousand. Significantly, the APPBO dropped below the national average in Arunachal Pradesh (12.7 thousand), Meghalaya (11.2 thousand) and Mizoram (9.5 thousand). A similar trend decline was observed in the rural APPBO with the notable feature that in Arunachal Pradesh and Mizoram they were lower than the total average APPBO in the respective States.

The 1990s show a reversal in the trend and rise in the APPBO in the country. Though the same phenomenon is also observed in the region, and in each of the States, it rose much more in the region, particularly in Manipur and Nagaland. Further, while the APPBO at the national level has again resumed a declining trend during the first half of the current decade (2001-2005), the rising trend observed since 1991 continues in many of the States in the region. Though the rural APPBO rose in all the States since 1991, in Manipur and Nagaland they increased alarmingly to over 47 thousand by 2005, more than doubled the level of 1991 and twice the national average (Table 1).

In hilly terrains characterised by sparse population distribution and transport bottlenecks, despite a lower APPBO, a large section of the population, however, may not be effectively served by the existing bank branches. This would be the case in Arunanchal Pradesh, Meghalaya and Mizoram where APPBO is lower, but the average area per bank branch range from 121 square kms. to 1,232 square kms.; far higher than national average of 47 square kms. In the case of Manipur and Nagaland, the very high APPBO coupled with larger area per bank branch (227 to 286 square Kms.) indicates the extremely low level of banking penetration, particularly in the rural areas (Table 1).

Table 1: APPBO and Area Covered

States	Total APPBO					Rural APPBO					Area per SCB Branch Sq. Kms.
	1973	1981	1991	2001	2005	1973	1981	1991	2001	2005	
1	2	3	4	5	6	7	8	9	10	11	12
A.P	82826	28720	12714	15813	16211	79678	26837	11424	15508	17294	1232
Assam	89906	36308	18135	21008	20960	194279	59301	22747	28422	30678	62
Manipur	126111	36435	21871	28436	29791	164173	45456	23777	38686	46931	286
Meghalaya	59432	21203	11233	12741	12658	182776	30402	12455	14257	15536	121
Mizoram	359429	41146	9449	11279	11278	n.a.	46493	5812	7377	7883	276
Nagaland	93287	18451	17036	28009	27990	252227	26188	21767	44211	49272	227
Tripura	96747	19553	15318	17438	17429	184179	26107	18536	22067	23701	56
N E Region	90523	32018	16870	19894	19885	188566	48318	20123	25629	27796	131
All India	34982	18062	13711	15209	14949	102270	27820	17996	22722	24856	47

Source : Compiled from Various Issues of BSR, RBI, Basic Statistics, NEC and Census Data.

Gaps in Deposit and Credit Accounts per 100 Adult Population

Branch expansion and decline in APPBO should lead to increased recourse to banking transaction by the adult population, *i.e.*, a higher current and savings accounts, and credit accounts per 100 adult population.[1] Reflecting the positive impact of higher branch expansion and the decline in APPBO, the number of current and savings accounts per 100 adult population increased at a much faster rate in the region than at the national level during 1973 to 1991. However, because of the low base, the gap in this measure of banking penetration from the national average remained glaring in 1991, excepting Meghalaya. Till 1991, the States with the fastest branch expansion also recorded a faster growth in the number of current and savings accounts per 100 adult population and the ratio was higher in those States where the APPBO was lower, *viz.*, Arunachal Pradesh, Meghalaya and Mizoram.

Since 1991, there was a concerting trend with the ratio declining substantially in all the States, except Assam and Tripura. During 1991 and 2005, the decline was to the extent of 19.0 percentage points in Meghalaya and over 20.0 percentage points in Nagaland that for this latter State, the ratio in 2005 was lower than what was in 1981.

Another national trend which has eluded all these States is that while the ratio has risen during 2001 to 2005 at the national level, it continues to follow the declining trend. Thus in 2005, the current and savings accounts per 100 adult population ranged from 19.5 in Manipur to 40.9 in Meghalaya, with a regional average of 37.3, as against the national average of 58.3 (Table 2).

A similar trend is also observed for credit accounts per 100 adult population, which indicates access to bank credit. The ratio grew much more rapidly in all the States during the 1970s and the 1980s. However, barring Tripura, they remained below the national average throughout. Showing the national pattern, between 1991 and 2001, the ratio declined in all the States, barring Arunachal Pradesh and Mizoram, and excepting these two States, the ratios in 2005 stood significantly lower than the level in 1991 despite some improvement during 2001 to 2005. In 2005, the ratio ranged from 3.6 (Nagaland) to 13.6 (Tripura), with regional average of 6.6, as against the national average of 13.3 (Table 2).

Within a State there was large scale disparity in the level of banking penetration between the rural and urban population during 2001-05. In Arunanchal Pradesh, Meghalaya and Mizoram, with

Table 2: Current and Savings, and Credit Account per 100 Adult Population

States	Current and Savings Accounts					Credit Accounts				
	1973	1981	1991	2001	2005	1973	1981	1991	2001	2005
1	2	3	4	5	6	7	8	9	10	11
A.P	1.4	10.8	47.0	45.9	37.8	0.02	0.8	3.0	6.8	6.0
Assam	3.4	11.6	34.9	39.4	39.1	0.28	1.4	7.0	4.5	5.9
Manipur	2.0	8.2	25.2	20.1	19.5	0.31	0.8	4.3	3.2	4.0
Meghalaya	6.9	21.7	59.1	44.3	40.9	0.61	3.1	9.1	6.9	7.7
Mizoram	0.5	5.5	41.8	25.8	29.0	0.01	0.5	4.6	5.4	7.7
Nagaland	2.9	16.7	41.3	22.3	19.7	0.12	1.7	5.8	2.6	3.6
Tripura	5.4	10.7	39.3	37.0	36.1	0.44	6.6	23.5	12.3	13.6
N E Region	3.6	12.2	37.6	38.2	37.3	0.30	1.9	8.5	5.4	6.6
All India	10.5	28.9	60.3	55.0	58.3	1.87	6.2	13.9	9.7	13.3

Source : Compiled from Various Issues of BSR, RBI and Census Data.

better coverage of population per bank branch, the divide in current and savings account per 100 adult population was lesser as compared to the divide at the national level. Only Arunachal Pradesh had higher than national average level of current and savings account per 100 adult in rural areas, while for the urban areas only Assam had an average above the national average. In Manipur and Nagaland, where the rural APPBO is alarmingly high, over 90.0 per cent of the rural adult population had no current and savings account.

With regard to credit accounts per 100 adult population, they were lower than national average for both the urban and rural area in all the States, except Tripura. However, the gap between rural and urban areas was lesser in Arunachal Pradesh, Meghalaya, Mizoram and Tripura, while in the remaining three States, they were much higher (Table 3).

Table 3: Centre-Wise Current and Savings, and Credit Account per 100 Adult Population

States	Centre	Current and Savings Account					Credit Accounts				
		2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
1	2	3	4	5	6	7	8	9	10	11	12
A.P	Rural	33.1	33.3	33.8	29.7	29.4	4.4	4.8	4.7	4.5	4.6
	Urban	95.6	97.7	84.7	74.2	70.0	17.1	7.1	7.9	9.7	11.9
Assam	Rural	21.1	20.4	21.7	21.8	22.3	2.6	3.0	3.0	3.2	3.5
	Urban	165.3	159.3	150.6	146.8	153.9	18.0	16.2	17.1	19.2	22.1
Manipur	Rural	7.5	7.4	6.7	5.9	8.7	1.6	1.5	1.5	1.5	2.1
	Urban	60.3	54.5	56.5	53.3	54.1	8.2	7.0	7.2	8.6	10.0
Meghalaya	Rural	25.7	26.1	27.0	24.1	23.3	4.9	5.4	5.0	4.7	5.8
	Urban	120.2	112.7	111.3	112.5	112.7	15.0	10.6	11.7	15.7	15.4
Mizoram	Rural	18.7	18.7	20.1	19.8	22.1	4.6	5.7	5.7	6.9	6.3
	Urban	33.0	28.2	29.9	29.4	36.0	6.4	5.0	5.8	7.9	9.3
Nagaland	Rural	5.1	4.8	4.6	4.8	5.1	1.1	1.1	1.0	1.0	1.4
	Urban	102.2	93.2	93.5	87.1	87.4	9.1	9.9	10.2	11.3	13.7
Tripura	Rural	20.4	19.7	20.3	21.3	20.9	10.3	15.5	14.1	11.1	10.8
	Urban	118.0	117.4	111.5	107.1	110.0	22.4	31.8	30.0	28.1	27.2
N E Region	Rural	20.5	20.0	21.0	20.8	21.3	3.4	4.2	4.1	4.0	4.3
	Urban	134.6	129.2	123.2	119.6	124.4	16.3	15.4	15.9	17.5	19.6
All India	Rural	24.1	23.9	24.4	25.0	25.7	5.7	6.3	6.3	6.3	6.9
	Urban	135.3	133.7	132.3	137.8	142.8	19.9	20.4	21.8	26.3	29.9

Source : Compiled from Various Issues of BSR, RBI and Census Data.

Within this low level of banking penetration, there was also wide inter-district divergence. The total deposit accounts (including term deposits) per 100 population reveal the following. [2]

In 2005, the range in the ratio within a State was:[3]

Arunachal Pradesh - from 3.4 (Dibang Valley) to 55 (West Kameng);

Assam - from 13.6 (Dhubri) to 56.4 (Kamrup);

Manipur - from 2.3 (Tamenglong) to 20.4 (Imphal);

Meghalaya - from 2.9 (South Garo Hills) to 52 (East Khasi Hills);

Mizoram - from 5.4 (Lawngtlai) to 26.2 (Aizwal);

Nagaland - from 3.4 (Tuensang) to 37 (Dimapur); and

Tripura - from 18.9 (Dhalai) to 37 (West Tripura).

The ratio declined during 2001 to 2005 in most of the districts in each of the States. Further, districts that had the highest ratio were almost always the district with respective State capital or commercial town/cities having better banking facility. This inter-district disparity across the States is partly explained by APPBO, with correlation coefficient of -0.54, *i.e.,* the districts with higher bank penetration (lower the APPBO), in general also had higher deposit accounts per 100 population.

Deposit and Credit Growth

The deposit and credit growth rate were estimated using a semi-log trend of the following type,

$$\text{Log}Y = \beta_0 + \beta_1 \text{ Trend}$$

with β_1 as the estimate of growth rate.

Over the entire period of 1972 to 2005, deposit growth for the region as whole was 17.3 per cent, with each of the States, barring Assam, recording growth rates above the national average of 16.3

per cent. Eventhough, as a national pattern, there was a continuous deceleration in the growth in each of the decades, the rate of deceleration was faster in the region. During 1972 to 1981 and 1981 to 1991, deposit growth in each of the States was above the national average. During 1991 to 2001, four States recorded growth below the national average, while during 2001-2005, three States recorded sub-average growth rates. Thus, during 1991 to 2005, the average deposit growth in the region was below the national average (Table 4).

With regard to credit, distinction between two types of credit, *viz.*, sanctioned credit and utilised credit[4], is important for some of the States in the region. Credit sanctioned by the SCBs in the region could be utilised elsewhere in other parts of the country. Similarly, credit sanctioned elsewhere in other parts of the country could be utilised in the region. The difference between the two is therefore the net inflow of credit. Being less developed, the region typically receives net inflow of credit, though it is mostly confined to very few states, in particular Assam. Either this arises due to the sanctioning authority being located at other places where the corporate offices of SCBs are stationed, or more importantly, the agencies making the investment are also headquartered elsewhere. This would also reflect lack of local entrepreneurs to make investment in viable projects that exist in the region. Thus, non-local

Table 4: Deposit Growth

(in per cent)

States	Annual growth	Annual growth	Annual growth	Annual growth	Annual growth
	1972-1981	1981-1991	1991-2001	2001-2005	1972-2005
1	2	3	4	5	6
A.P	30.5	25.1	14.2	16.8	22.0
Assam	21.6	17.4	15.3	14.1	15.6
Manipur	27.9	19.5	16.2	18.5	17.6
Meghalaya	14.6	20.0	15.2	15.9	17.0
Mizoram	39.7	18.9	14.3	17.5	21.3
Nagaland	27.3	23.0	15.9	10.3	19.8
Tripura	17.8	17.8	20.8	12.8	18.4
N E Region	21.2	18.5	15.50	14.3	17.3
All India	18.3	16.3	15.50	15.2	16.3

Source : Authors' estimate.

entrepreneurs or firms exploit these investment opportunities, but they seek bank credit from those places where they are based and not from the region. It is interesting to find that over the period 1972 to 2005, sanctioned credit growth for the region as a whole of 16.4 per cent was above the national average of 15.5 per cent, with each of the constituting States recording a higher growth. They ranged from 15.6 per cent (Assam) to 26.9 per cent (Mizoram) (Table 5). However, growth in utilised credit was below the national average for the region as whole, even though all the States, barring Assam, recorded growth rates higher than the national average. This reflects the predominant share of Assam in credit utilisation in the region or most of the net inflow of credit was confined to Assam.

During 1991-2001, however, there was also large-scale deceleration in the growth of both sanctioned and utilised credit, while at the national level a marginal acceleration was observed. Further, this was the only decade when the growth in both types of credit was below the national average in all the States. In the case of Assam, the sub-average growth rate continued during 2001-2005 also. During 2001-2005, there was a substantial acceleration in the growth of both sanctioned and utilised credit; far more than the trend at the national level. While the growth in sanctioned credit during 1991 to 2001 ranged from 1.93 per cent in Nagaland to 12.8 per cent in Meghalaya (national average of 14.83 per cent), they ranged from 16.0 per cent

Table 5: Credit Growth

(in per cent)

States	Sanction					Utilisation				
	Annual growth 1972-1981	Annual growth 1981-1991	Annual growth 1991-2001	Annual growth 2001-2005	Annual growth 1972-2005	Annual growth 1972-1981	Annual growth 1981-1991	Annual growth 1991-2001	Annual growth 2001-2005	Annual growth 1972-2005
1	2	3	4	5	6	7	8	9	10	11
A.P	41.90	35.60	9.30	25.30	25.40	22.50	33.20	5.60	22.10	20.70
Assam	20.80	19.50	10.10	16.00	15.60	15.50	18.30	7.00	9.20	14.60
Manipur	24.90	26.30	10.00	21.40	18.50	27.50	25.60	10.20	20.90	18.60
Meghalaya	15.30	21.10	12.80	41.00	17.90	19.80	24.10	10.30	53.40	19.20
Mizoram	44.20	32.30	12.60	34.00	26.90	64.60	32.10	10.70	32.70	30.00
Nagaland	28.90	23.70	1.93	24.00	18.00	30.60	24.20	1.70	19.30	18.10
Tripura	40.00	22.00	6.20	20.20	19.30	34.10	21.20	6.97	19.60	18.30
N E Region	21.80	20.70	9.50	20.00	16.40	16.90	19.60	7.10	16.40	15.40
All India	17.80	14.80	14.83	18.20	15.50	17.80	14.80	14.83	18.20	15.50

Source : Authors' estimate.

in Assam to 41.0 per cent in Meghalaya during 2001-2005 (national average of 18.2 per cent) (Table 5).

A similar pattern is also observed with regard to the growth in utilised credit during 2001-05, with the notable feature that in Assam the acceleration was marginal, and as a result, the growth rate was far below the regional as well as the national average. In contrast, in Meghalaya, while the acceleration in the growth of sanctioned credit during 1991-2001 to 2001-2005 was little over three times, in terms of utilisation it was about five times, suggesting substantial inflow of credit (Table 5). The sectoral composition of this trend in the utilised credit is carried out in a later section.

Given the above trend in the decadal growth rates, we attempted to find out the most significant single year when a trend break in the growth rate could be detected during 1981 to 2005. The decade of the 1970s was excluded as many of the States started from a low base and consequently reflected exaggerated growth rates. For the same, a semi-log trend of the following type was employed.

$$LogY = \beta_0 + (\beta_2 + \beta_0)\, Dummy + \beta_1\, Trend + (\beta_1 + \beta_3)\, Dummy * Trend$$

This is a kinked semi-log trend fit to check for presence of break in the growth rate over the sample period. Dummy takes a value of 1 from the point of significant departure from the overall trend growth and thereafter, and 0 otherwise.[5] The point that gave the highest R-bar square, *i.e.*, the best fit of the regression was chosen. The growth rate before the identified point is given by β_1, and thereafter, it is given by $(\beta_1 + \beta_3)$. The growth rate accelerates after the identified point when $\beta_3 > 0$ and decelerates with $\beta_3 < 0$.

Deposit growth decelerated in all the States, except Manipur, with the years of deceleration spread between 1986, 1989 and 1992, while at the national level no such statistically significant trend was observed. The deceleration was over 10.0 percentage points in Arunachal Pradesh, Mizoram and Nagaland. Interestingly, in Manipur a contrasting trend of accelerated growth in deposit is discerned from 1986, yet remained about the decelerated growth of other States only.

Notwithstanding the acceleration in the sanctioned credit in all the States during 2001-05 mentioned above, a drastic deceleration in the growth of sanction credit beginning around the early 1990s can be discerned in all but one State (Meghalya). It reflects that the deceleration since about the early 1990s was much more prominent than the acceleration in very recent years that for the combined period there is an overall deceleration. The rate of deceleration ranged from about nine percentage points in Assam to about 30.0 percentage points in Arunachal Pradesh. In contrast, for Meghalaya and at the all India level, reflecting the predominance of higher growth rate during the last five years, an accelerated growth rate from the earlier period is discerned. A similar trend is also observed in utilised credit. However, the deceleration began at a later period than that of sanctioned credit. In Assam which received the bulk of the net inflow of credit, the year from which deceleration began coincides with the onset of implementation of financial sector reforms in India, *i.e.*, 1993-94 (Table 6).

Gap in Per Capita Deposit and Credit

As would be expected, barring Meghalaya, the per capita deposit in 1973 was much lower than the national level and continued to do so in 2005. In 1973, the per capita deposit in these States ranged from 7.7 per

Table 6: Trend Break in the Growth of Deposit and Credit During 1981 to 2005

(in per cent)

States	Deposit			Sanction			Utilised		
	Before Break	After Break	Break at	Before Break	After Break	Break at	Before Break	After Break	Break at
1	2	3	4	5	6	7	8	9	10
A.P	25.14	14.16	1992	41.94	11.32	1986	33.16	12.67	1992
Assam	19.25	15	1989	20.59	11.66	1991	17.37	15.03	1994
Manipur	10.49	15.91	1986	29.99	9.84	1990	28.92	9.78	1989
Meghalaya	22.39	15.56	1989	14.61	40.99	2001	19.25	34.98	1997
Mizoram	30.58	15.72	1986	32.38	20.26	1992	42.78	16.67	1990
Nagaland	27.03	14.61	1989	28.1	6.95	1989	29.34	6.57	1989
Tripura	20.75	17.84	1992	23.15	9.1	1991	22.87	9.17	1991
N E Region	20.46	15.28	1989	21.77	11.9	1991	18.21	15.24	1994
All India	16.48	16.38	1986	14.61	17.74	2000			

Source : Authors' estimate.

cent of the national average in Mizoram to 95.3 per cent in Meghalaya, with regional average amounting to only 32.7 per cent of the national average. The relative gap narrowed up to 1991, and substantially so in three States, *viz.*, Arunachal Pradesh, Mizoram and Nagaland. However, during 1991 to 2001, the gap once again enlarged markedly in the four hilly States of Arunachal Pradesh, Meghalaya, Mizoram and Nagaland. During 2001 to 2005, there was a mixed trend with the gap narrowing for some States and widening for some States leading to a widening of the gap for the region from the national average since 1991. In 2005, per capita credit ranged from 25.7 per cent of the national average in Manipur to 78.4 per cent in Meghalaya, with the regional average forming 43.1 per cent of the national average (Table 7).

The gap in the per capita credit from the national average was much larger than the corresponding gap in per capita deposit. In 1973, sanctioned per capita credit ranged from no credit in Mizoram to 33.8 per cent of the national per capita credit in Meghalaya, with regional average forming only 16.6 per cent of the national average. During 1973 to 1991, there were significant catch up in all the States, except Meghalaya, thereby more than doubling the level of regional sanctioned per capita credit to 35.2 per cent of the national average. During 1991 to 2001, the trend reversed and the gap from the national average enlarged markedly in all the States, though some recovery has taken place during 2001 to 2005, excepting Assam. Thus, in 2005,

Table 7: Per Capita Deposit as ratio to national average

(in per cent)

States	1973	1981	1991	2001	2005
1	2	3	4	5	6
A.P	14.4	32.4	71.4	60.9	65.1
Assam	30.6	32.6	41.4	40.0	39.9
Manipur	15.5	22.2	24.8	19.6	25.7
Meghalaya	95.3	65.5	90.0	77.2	78.4
Mizoram	7.7	35.4	63.2	48.0	52.3
Nagaland	32.1	48.1	74.7	48.8	38.5
Tripura	34.8	32.4	42.6	53.1	49.1
N E Region	32.7	34.2	45.9	43.3	43.1
All India	100	100	100	100	100

Source : Estimated from BSR, RBI and Census data.

the gap in per capita sanctioned credit from the national level remained glaring, with the level ranging from 12.9 per cent of national average in Nagaland to 50.4 per cent in Meghalya and a regional average of 23.0 per cent (Table 8).

The gap with respect to per capita utilised credit was also large and remained so, but due to net inflow of credit it was narrower than the gap in terms of per capita sanctioned credit. In 1973, due to Assam (37.3 per cent of national average), the regional per capita utlised credit was 30.0 per cent of the national average, much higher than 16.6 per cent in terms of sanctioned credit. The State-wise range was no credit in Mizoram to 37.3 per cent of the national average in Assam. In 1991, the regional average moved up to 45.1 per cent of national average, with State-wise range of 28.5 per cent in Manipur to 58.2 per cent in Arunachal Pradesh. However, due to much slower growth in credit during 1991 to 2001, the per capita utlised credit for the region formed only 24.4 per cent of the national average in 2001. The difference between the utlised and sanctioned credit also declined during this period, indicating decline in the share of net inflow of credit in the total utilised credit in the region.

During 2001 to 2005, the gap from the national average narrowed down once again in all the States, except Assam. Meghalya and Mizoram particularly have made significant gain during the last five years, and for the former, the level of per capita utilised credit in

Table 8: Per Capita Credit as a ratio to National Average

(in per cent)

States	Sanction					Utilised				
	1973	1981	1991	2001	2005	1973	1981	1991	2001	2005
1	2	3	4	5	6	7	8	9	10	11
A.P	0.9	5.1	31.4	15.8	21.8	7.3	11.2	58.2	23.7	29.8
Assam	18.2	26.1	34.7	23.2	21.6	37.3	31.6	46.7	26.9	25.7
Manipur	6.9	10.9	28.2	14.4	16.4	5.5	13.3	28.5	14.0	16.4
Meghalaya	33.8	16.7	29.9	22.9	50.4	16.4	19.6	37.5	23.6	99.0
Mizoram	0.0	5.4	26.7	20.7	38.5	0.0	9.2	31.0	24.6	47.5
Nagaland	15.8	12.8	38.3	10.4	12.9	15.5	22.7	57.4	11.7	13.1
Tripura	5.2	25.3	49.4	20.4	21.4	8.2	27.3	41.7	20.3	21.6
N E Region	16.6	22.6	35.2	21.5	23.0	30.0	28.6	45.1	24.4	29.3
All India	100	100	100	100	100	100	100	100	100	100

Source : Estimated from BSR, RBI and Census data.

2005 was about the national average. Yet, because of the enlargement of the gap during the decade of the 1990s and the continuance of this trend in Assam, in 2005, the per capita utilised credit for the region was 29.3 per cent of the national average only; a gap even higher than what was in 1973. Thus, it is observed that much of the gain achieved in narrowing down the gap during the decades of the 1970s and the 1980s lost its ground during the last 15 years, and in particular during the decade of the 1990s (Table 8).

Gap in Deposit and Credit to Income (NSDP) Ratio

A number of studies [King and Levine (1992 and 1993), Benhabib and Spiegel (2000) and Khan and Snehadji (2003)] indicate that financial development is one of the major determinants of economic growth. While the direction of causality between financial development and economic growth is an unsettled issue, the higher the level of economic development the higher is the extent of financial deepening measured by the ratio of deposit and credit to GDP. In many developed countries of the Western countries, where financial deepening has reached a matured stage, credit and deposit to GDP ratios are much above 100.0 per cent. For instances, credit to GDP ratios in UK is around 159.0 per cent and in the Euro area it is about 145.0 per cent. These ratios are much lower in the developing countries like India, and more so in underdeveloped pockets such as North Eastern Indian States.

Deposit to NSDP ratio increased substantially since the beginning of the 1980s. However, the absolute gap from the national average increased over the years. The regional deposit to NSDP ratio, which stood at 17.7 per cent during 1981-1985 increased to 35.8 per cent during 2001-05, as against the increase in the national average from 35.6 per cent to 63.6 per cent during the same period. The gap with the national average enlarged significantly during the quinquennium 2001-2005. The increase in the ratio during this quinquennium over the previous one was 6.0 percentage points in the region, which was less than half the increase at the national

Table 9: Deposit to NSDP Ratio

(in per cent)

During	A.P.	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Tripura	N.E.	India
1	2	3	4	5	6	7	8	9	10
1981-85	13.7	18.0	8.5	29.1	26.2	21.2	12.3	17.7	35.6
1986-90	25.4	23.4	12.7	41.6	21.8	28.6	20.2	24.1	43.5
1991-95	31.7	24.1	13.6	41.9	24.4	21.9	24.6	25.0	45.6
1996-00	35.7	29.3	16.5	46.3	25.2	28.6	29.0	29.8	47.8
2001-05	45.9	39.5	21.8	56.8	27.9	26.9	34.2	35.8	63.6

Source : Estimated from BSR and Handbook of Statistics, RBI.

level of 15.8 percentage points. Large divergence in the ratio persists among the constituting States. Mizoram and Nagaland have recorded the slowest increase in the ratio, and as a result, from second and third highest during 1981-85, they fell to third and second lowest, respectively, during 2001-05. Manipur and Meghalaya have continued to be the States with the lowest and the highest ratio throughout. During 2001-05, the ratio ranged from 21.8 per cent in Manipur to 56.8 per cent in Meghalaya, as against the national average of 63.6 per cent (Table 9 and Chart 1).

Both sanctioned and utilised credit to NSDP ratio has remained not only lower than the national ratio, but the gap has widened since 1991-95. During 1986-90 and 1996-2000, while the ratio increased slowly at the national level, they declined in each of the States for both the types of credit. For utilised credit, the ratio for the region

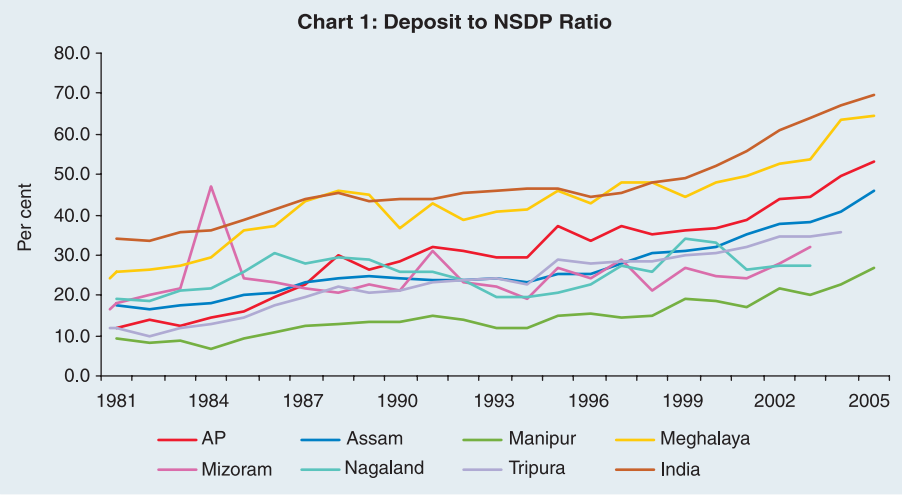


Table 10: Credit to NSDP Ratio

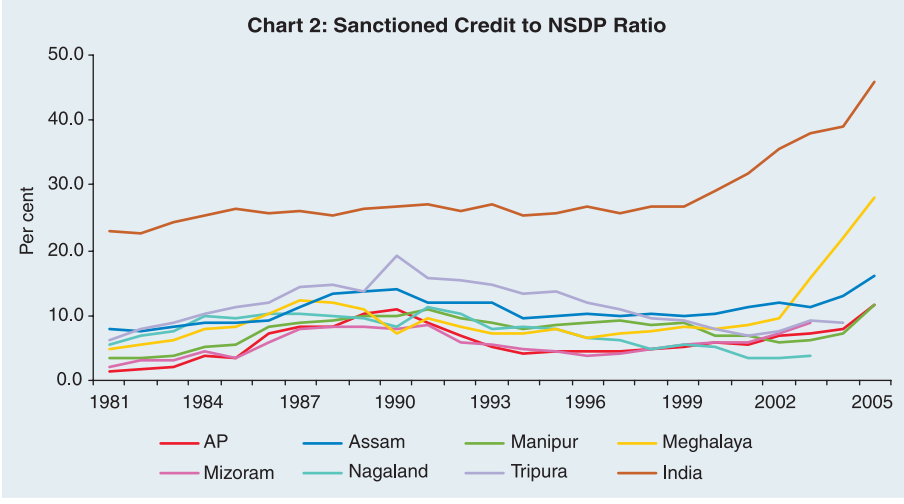
(in per cent)

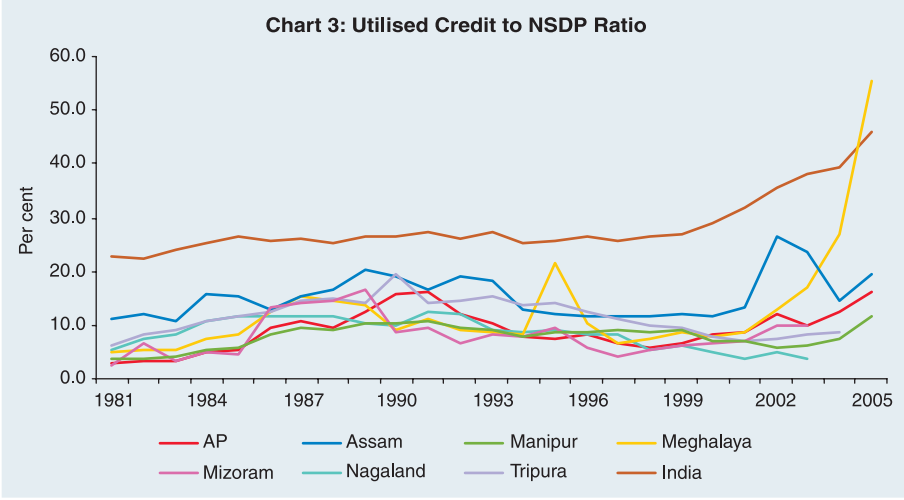
Average	A.P		Assam		Manipur		Meghalaya	
During	sanction	utilisation	sanction	utilisation	sanction	utilisation	sanction	utilisation
1	2	3	4	5	6	7	8	9
1981-85	2.5	4.0	8.3	13.0	4.3	4.5	6.5	6.3
1986-90	8.9	11.6	12.4	16.8	9.2	9.6	10.5	13.0
1991-95	6.0	10.8	11.0	15.8	9.2	9.2	8.0	11.7
1996-00	4.9	7.1	10.1	11.6	8.5	8.6	7.4	8.2
2001-05	7.9	11.8	12.7	19.4	7.5	7.5	16.8	24.2

Average	Mizoram		Nagaland		Tripura		NE		India
During	sanction	utilisation	sanction	utilisation	sanction	utilisation	sanction	utilisation	sanction
1	2	3	4	5	6	7	8	9	10
1981-85	3.2	4.4	7.8	8.7	8.8	9.1	7.7	11.2	24.3
1986-90	7.6	13.4	9.7	10.9	14.8	15.1	12.0	15.5	26.0
1991-95	5.8	8.3	9.1	10.3	14.6	14.3	10.6	14.4	26.3
1996-00	4.8	5.6	5.6	6.7	9.9	10.1	9.2	10.4	27.0
2001-05	7.3	8.9	3.5	4.0	8.1	7.9	9.8	16.0	38.1

Source : Estimated from BSR and Handbook of Statistics, RBI.

during 1996-2000 was lower than the ratio during 1981-85. The declining trend in the ratio has continued in Manipur, Nagaland and Tripura during 2001-05, while in the rest it increased. Thus, during 2001-05, while the credit to NDP ratio for the country was 38.1 per cent, for the region it was 9.8 per cent for sanctioned credit and 16.0 per cent for utilised credit, with the respective range among the States for the two types of credit being 3.5 per cent in Nagaland to 16.8 per cent in Meghalaya for sanctioned credit and 4.0 per cent in Nagaland and 24.2 per cent in Meghalaya for utilised credit (Table 10, Chart 2 and 3).





Gap in Credit Deposit Ratio

The higher gap in credit *vis-à-vis* deposit from the national average is reflected on the lower CD ratio in the region. However, there are differences between the CD ratio as per sanction and utilisation, and also among the States. First, there has been a substantial gap between the two types of credit in Arunachal Pradesh and Assam, and Meghalaya in the most recent years. Second, the ratio for both types of credit increased in all the States during 1972-75 to 1986-90, while at the national level a declining trend was observed. Yet, during 1986-90, when the sanctioned C-D ratio was at its peak in each of the States, they ranged from 25.6 per cent in Meghalaya to 71.3 per cent in Manipur, with a regional average of 49. 6 per cent, as against the national average of 59.9 per cent (Table 11). Only two States, *viz.*, Manipur and Tripura had higher than national CD ratio during the major part of the 1980s and first half of the 1990s. Third, while the gap with respect to sanctioned credit was large, in terms of utilised credit, the regional average did not diverge much from the national averge during 1972-75 to 1991-95 (Chart 4). This was due to a much higher CD ratio as per utilisation in Assam during this period. Fourth, since the first half of the 1990s, both types of C-D ratio dipped substantially in all the

Table 11: Credit Deposit Ratio

(in per cent)

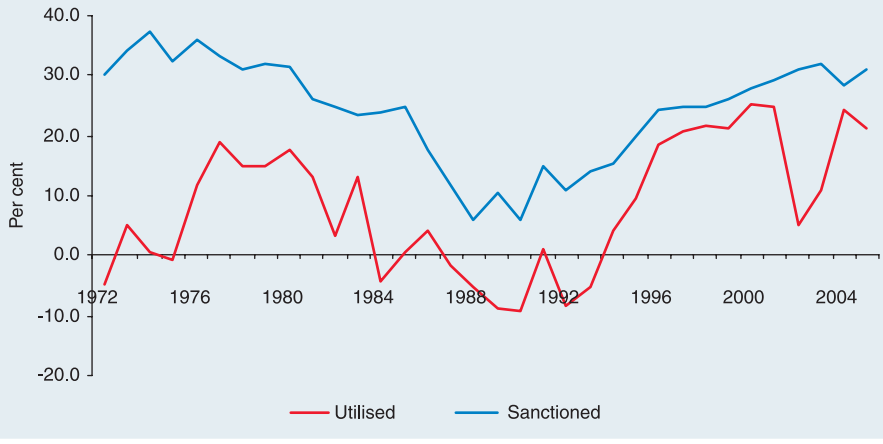
Average	A.P		Assam		Manipur		Meghalaya	
During	sanction	utilisation	sanction	utilisation	sanction	utilisation	sanction	utilisation
1	2	3	4	5	6	7	8	9
1972-1975	5.5	41.9	45.9	93.5	35.8	35.0	16.2	12.8
1976-1980	7.3	27.7	43.6	65.6	29.8	29.8	17.4	18.5
1981-1985	18.1	28.7	46.0	72.3	51.4	54.0	22.1	21.6
1986-1990	32.2	42.9	50.9	71.2	71.3	73.0	25.6	30.6
1991-1995	19.0	34.6	45.9	65.6	67.7	67.6	19.1	27.5
1996-2000	13.8	20.0	34.8	39.8	52.6	52.7	16.0	17.8
2001-2005	17.0	25.4	32.0	49.5	34.1	34.5	28.5	40.4

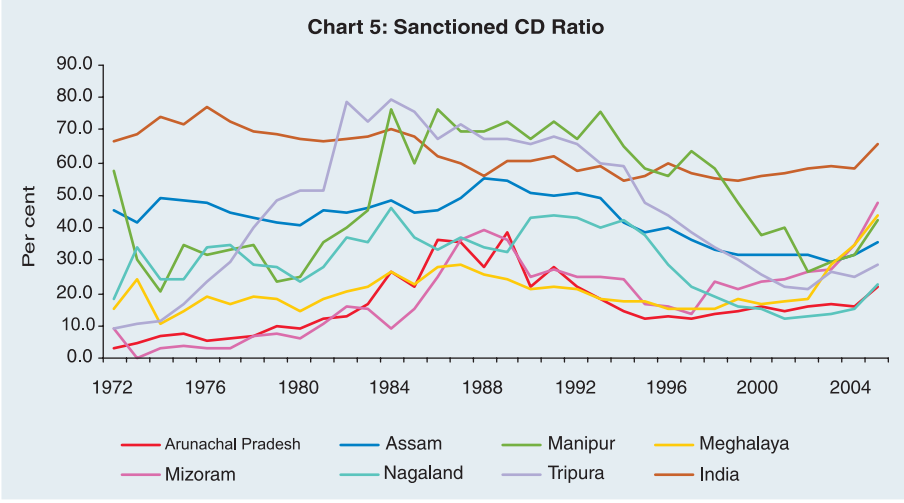
Average	Mizoram		Nagaland		Tripura		NE		India
During	sanction	utilisation	sanction	utilisation	sanction	utilisation	sanction	utilisation	sanction
1	2	3	4	5	6	7	8	9	10
1972-1975	4.0	1.8	25.1	25.4	11.8	18.5	37.0	70.6	70.5
1976-1980	5.2	6.4	29.8	36.9	38.6	42.7	38.4	55.6	71.2
1981-1985	13.0	18.2	36.8	40.8	71.6	73.9	43.4	62.9	68.0
1986-1990	32.4	58.8	36.1	40.4	67.8	68.0	49.6	64.1	59.9
1991-1995	23.7	34.6	41.5	46.8	60.0	58.4	42.5	57.4	57.7
1996-2000	19.4	22.6	20.3	24.4	34.5	35.2	31.0	35.0	56.5
2001-2005	32.1	38.9	15.3	16.7	24.7	24.1	29.4	42.3	59.7

Source : Estimated from BSR, RBI.

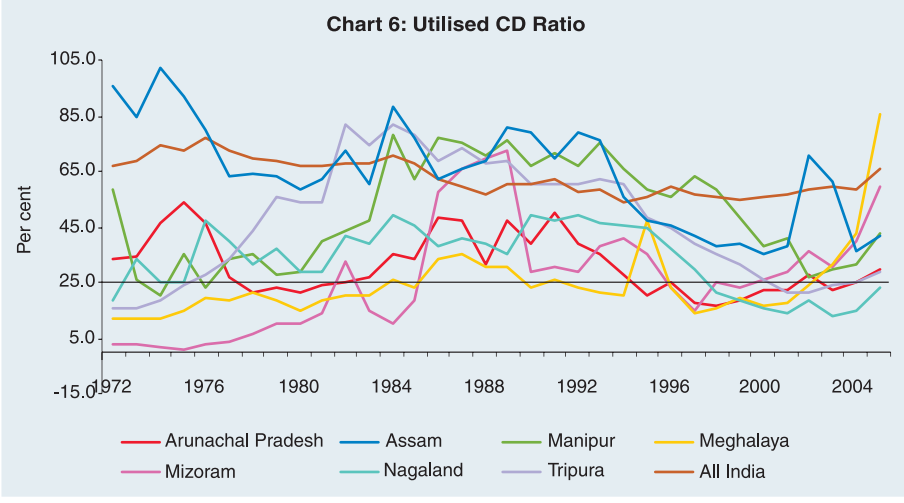
States, though Arunachal Pradesh, Meghlaya and Mizoram have made some recovery during 2001-2005. The result was that, for the region as a whole, a substantial gap from the national average

Chart 4: Gap in Region CD Ratio from National Average





developed for both types of credit, while earlier the gap was only in terms of sanctioned credit. Fifth, the inter-State disparity in CD ratio decreased substantially, but at a lower level than earlier. During 2001-05, sanctioned CD ratio ranged from 15.3 per cent in Nagaland to 34.1 per cent in Manipur, with a regional average of 29.4 per cent, as against the national average of 59.7 per cent. During the same period, utilised CD ratio ranged from 26.7 per cent in Nagaland to 49.5 per cent in Assam (Table 11, Chart 5 and 6).



Sectoral Deployment of Credit

The following provides the trend in the sectoral composition of utilised credit in these States *vis-à-vis* the national pattern. There has been a decline in the share of agriculture, which in most of the States were above 20.0 per cent during 1980-83 and 1992-95, and were markedly above the share in the national average. While this decline in the share of agriculture is a national phenomenon, the extent of decline between 1992-95 and 2001-05 was much more striking in most of the States in the region. The decline in the share of industry was even more than that of agriculture, with the exception of Meghalaya (due to one time financing of state electricity board by a nationalised bank) and Tripura where share of industry has been traditionally low. The share of transport operators also dipped significantly, but most of the decline in its share took place during 1980s. Similarly, barring Arunachal Pradesh, the share of trade also declined in all the States. However, within trade, share of retail trade has been predominant in the region, which is unlike at the national level where wholesale trade, which is considered to be more productive than retail trading (Roy, 2006), corners a larger share (Table 12).

On the other hand, share of personal loans increased substantially in all the States. While this has been a national trend, it was much more prominent in the region that, for most of the States, this sector now constitutes the most important sector in the utilisation of bank credit. The share of personal loan during 2001-05 ranged from 23.0 per cent in Meghalaya to 44.6 per cent in Mizoram, as against the national average of 20.1 per cent (Table 12 and Chart 7).

Thus, even though the total CD ratio during 2001-05 was substantially lower than national average in all the States in the region, credit for personal loans to deposit ratio of 10.7 per cent for the region as a whole was higher than the national average of 9.94 per cent, with three States exceeding the national average and the rest of the States rapidly catching up (Table 13).

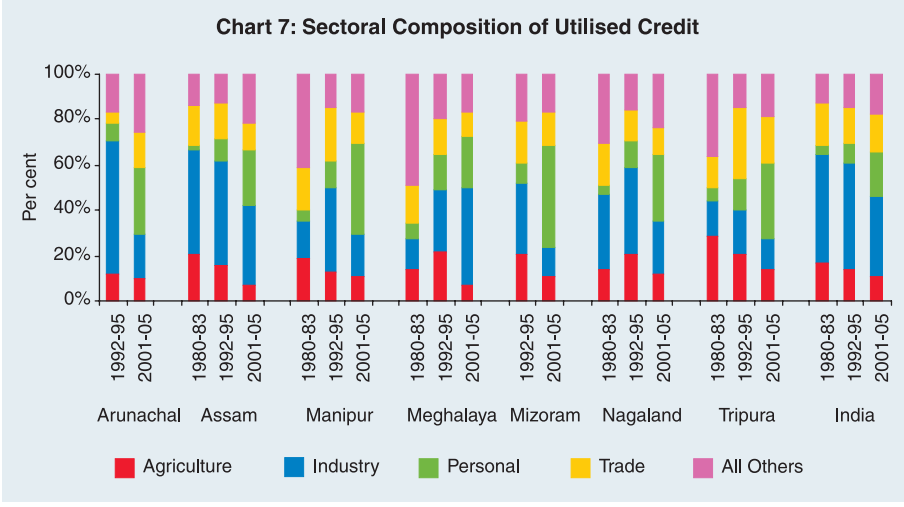
Table 12: Sectoral Share of Utilised Credit

(in per cent)

Sectors	Arunachal Pradesh		Assam			Manipur			Meghalaya		
	1992-95	2001-05	1980-83	1992-95	2001-05	1980-83	1992-95	2001-05	1980-83	1992-95	2001-05
1	2	3	4	5	6	7	8	9	10	11	12
Agriculture	12.2	10.1	20.9	15.2	7.1	18.7	13.2	11.1	16.2	21.9	6.6
Direct Finance	11.2	8.9	17.9	11.7	5.3	12.7	11.9	8.6	12.3	18.5	5.0
Indirect Finance	2.1	1.1	3.1	3.5	1.8	5.9	2.1	2.5	0.4	3.4	1.5
Industry	58.8	18.8	45.6	46.6	34.7	16.4	36.8	18.5	15.7	26.7	43.2
Transport Operators	6.4	3.6	7.2	4.3	2.3	33.8	8.6	2.5	28.0	6.0	2.8
Professional& Other Services	1.8	7.6	2.2	2.4	2.8	3.6	2.1	3.7	5.0	2.1	3.7
Personal Loans	7.5	29.2	2.3	9.3	24.8	5.0	12.0	39.6	8.0	15.7	23.0
Rest Of Personal Loans	5.8	21.6		5.6	14.7		6.8	22.1		7.2	13.6
Trade	4.7	16.9	17.7	16.1	12.2	18.3	23.3	14.2	19.2	16.1	10.6
Wholesale Trade	1.1	4.0		3.6	3.8		2.7	2.0		3.5	3.4
Retail Trade	3.6	13.0		12.5	8.4		20.6	12.3		12.6	7.2
Finance	0.0	1.7		1.0	3.3		1.8	0.1		1.0	0.2
All Others	8.5	12.1	4.0	5.2	12.8	4.3	2.2	10.3	6.2	10.6	9.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
SSI	7.3	6.6	8.6	11.0	6.0	5.7	28.8	10.3	6.9	8.6	4.0

Sectors	Mizoram		Nagaland			Tripura			All India		
	1992-95	2001-05	1980-83	1992-95	2001-05	1980-83	1992-95	2001-05	1980-83	1992-95	2001-05
1	2	3	4	5	6	7	8	9	10	11	12
Agriculture	21.0	10.8	13.8	20.8	11.5	28.0	20.8	14.0	16.5	13.3	10.7
Direct Finance	19.9	10.1	12.5	17.3	10.1	23.4	18.6	13.1	12.5	11.6	8.7
Indirect Finance	1.1	0.7	1.3	3.5	1.4	4.5	2.2	0.9	4.0	1.7	2.0
Industry	31.2	13.1	33.0	38.0	23.4	16.2	19.7	13.1	48.5	47.5	35.2
Transport Operators	10.6	6.5	20.8	7.7	2.5	24.6	6.4	3.6	4.9	2.2	2.0
Professional& Other Services	1.1	1.4	5.2	2.5	4.5	2.5	2.7	6.4	2.4	2.1	4.0
Personal Loans	8.8	44.6	4.4	11.4	29.9	5.3	13.7	33.8	3.7	9.0	20.1
Rest Of Personal Loans	3.1	13.3		7.3	23.2		10.2	19.9		5.1	9.8
Trade	18.2	14.7	18.0	14.6	12.0	14.2	30.7	20.6	18.4	15.6	16.2
Wholesale Trade	4.0	3.7		2.2	3.4		3.0	4.0		10.4	8.7
Retail Trade	14.3	11.0		12.3	12.0		27.7	16.5		5.2	7.5
Finance	1.2	0.1		0.1	1.5		3.8	0.3		2.9	4.8
All Others	7.8	8.7	4.8	4.9	14.6	9.1	2.2	8.2	5.6	7.2	6.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SSI	11.0	6.3	14.5	20.3	10.0	7.2	11.4	6.6	11.8	11.8	6.1

Source : Estimated from BSR, RBI.



The broad observations which follow from the trends in the above banking indicators are: first, much more rapid strides were made in the region in all the banking indicators during the first two decades of the post nationalisation phase since 1969. Consequently, the gap from the national average narrowed down significantly, and in indicators such as APPBO, it crossed over, *i.e.*, lower than the national average, in Arunachal Pradesh, Meghlaya and Mizoram. Yet, in almost all the other remaining indicators, the gap remained glaring as the States in the region started from a much lower base. Second, much of the gain during the first two decades of post-nationalisation phase lost its ground during the decade of the 1990s, and for some of the indicators such as the level of current and savings accounts per 100

Table 13: Personal Loan to Deposit Ratio

(in per cent)

Year	Arunachal	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Tripura	N.E. Region	India
1	2	3	4	5	6	7	8	9	10
2001	4.27	6.99	9.01	4.32	10.29	3.76	5.20	6.37	6.95
2002	6.13	8.35	8.58	4.84	11.98	3.83	6.43	7.53	7.35
2003	6.47	13.27	12.74	5.60	15.76	4.07	7.83	11.14	8.93
2004	8.78	12.39	16.85	10.41	21.32	5.89	9.21	11.71	11.85
2005	12.07	15.80	20.83	24.20	29.04	10.96	11.69	16.50	14.65
Average	7.55	11.36	13.60	9.87	17.68	5.70	8.07	10.65	9.94

Source : Estimated from BSR, RBI.

adult population and per capita credit, the gaps from the national average reverted back to the level of earlier period. Given the trend at the national level, widening of gap in the banking indicators of the region from the national average during the 1990s indicates retardation on in the growth of activities of SCBs in the region during this period. Third, there has been a differential impact among the States in the region.

Section III: Explaining Observed Trends and Impediments to Flow of Credit

Reasons for the Observed Trend

Given the unique features of the region, the financial sector reforms introduced since the beginning of the 1990s will have much to do with the observed trends. A substantial transformation of the banking sector has taken place with the introduction of decontrol of interest rates, reduction of pre-emption of banking resources, while at the same time putting in place the international best practices on prudential norms, income recognition and capital adequacy, among others. Given the health of the SCBs at that time, these measures severely restricted the leverage and the bottom lines of banks in India. In the new environment, SCBs slowed down branch expansion where the business prospect was limited, and curtailed credit when the risk of default was high.

In the region, these problems were much more severe due to the unique features of the States. Low business prospects was combined with lower recovery rate and higher NPAs, which led to severe curtailment in branch expansion and credit disbursement in the aftermath of financial sector reforms. These constraints were not there earlier, as SCBs following nationalisation, adopted social banking with less consideration on commercial aspects. However, as pointed out by Mohan (2006), at the national level also this strategy of banking development may have reached its limit by the 1990s.

Some of the indicators which reflect this lower volume of business are deposit and credit per branch and per employee (Table 14). In 1991, the average deposit per branch for the region was Rs. 183 lakh (state-wise range from Rs. 129 in Manipur to Rs. 301 lakh in Nagaland), as against the national average of Rs. 325 lakh. As on 2005, the respective figures were Rs. 1,432 lakh (state-wise range from Rs. 986 in Mizoram to Rs. 1,798 in Nagaland) and Rs. 2,497 lakh. However, deposits in general are mobilised at the lower cost in the region, as the share of current deposits in total deposits is higher than national average in almost all the States. For instance, in 2005, this share was 15.85 per cent for the region (State-wise range from 11.74 per cent in Tripura to 31.64 per cent in Manipur), while at the national level it was 12.13 per cent. The higher share of current deposit could arise on account of government deposit accounts, which are current in nature.

Credit per branch was even lower. In 1991, the average credit per branch in the region was Rs. 86 lakh (state-wise range from Rs. 39 lakh in Mizoram to Rs. 132 lakh in Nagaland), as against the national average of Rs. 201 lakh. In 2005, credit per branch increased to Rs. 501 lakh (state-wise range from Rs. 387 lakh in Arunachal Pradesh to Rs. 723 in Meghalaya), but remained substantially lower than the national average of Rs. 1,647 lakh.

Table 14: Business Indicators of Banks

(in Rs. Lakh and per cent)

States	Deposit per branch		Credit per branch		Deposit per employee		Credit per employee		Share of Current Deposit	
	1991	2005	1991	2005	1991	2005	1991	2005	1992	2005
1	2	3	4	5	6	7	8	9	10	11
A.P	215	1762	60	387	20.9	193.0	5.8	42.4	19.3	22.4
Assam	178	1398	88	493	15.9	126.1	7.9	44.5	18.7	15.0
Manipur	129	1278	93	542	12.9	129.6	9.3	54.9	24.8	31.6
Meghalaya	239	1657	53	723	20.0	177.8	4.4	77.6	17.2	14.3
Mizoram	142	986	39	472	22.7	126.8	6.3	60.6	21.8	16.1
Nagaland	301	1798	132	412	24.6	170.9	10.8	39.1	14.3	20.6
Tripura	155	1429	105	409	13.2	128.3	9.0	36.7	18.5	11.7
N E Region	183	1432	86	501	16.5	134.5	7.8	47.1	18.6	15.9
All India	325	2497	201	1647	20.6	194.0	12.7	128.0	17.9	12.1

Deposit per employee in the region is also lower than the national average. However, the gap is much lesser than the gap in terms of deposit per branch, implying a lower number of employee per branch than the national average. Yet, the number of customers (deposit account) per staff in 2005 was lower than national average in all the States, except Assam.[6] In 1991, the regional average deposit per employee was Rs. 16.54 lakh, as against the national average of Rs. 20.56 lakh, but three States (*viz.*, Arunachal Pradesh, Mizoram and Nagaland) exceeded the national average. In 2005, none of the States exceeded the national average of Rs. 194 lakh, giving a regional average of Rs. 134.47 lakh.

Similarly, credit per employee is lower but again not to the extent of the gap observed in credit per branch.[7] However, the gap from the national average is much higher for credit per employee than deposit per employee. In 1991, credit per employee for the region was Rs. 7.76 lakh (with a range of Rs. 4.42 lakh in Meghalaya to Rs. 10.81 lakh in Nagaland), while the national average was Rs. 12.73 lakh. By 2005, the gap enlarged with regional average of Rs. 47.07 lakh as against the national average of Rs. 127.99 lakh, while State-wise, it ranged from 36.75 lakh in Tripura to Rs. 77.56 lakh in Meghalaya.

In other words, both the business turnover per branch and employee are lower than the national average and the gap grew. Within this situation, liability (deposit) per branch and per employee was relatively higher than the corresponding asset (credit) per branch and per employee in the region. On the other hand, the share of non-performing component of these credits was much higher, thereby indicating that banks branches were more unviable in region than at the national level. Half a decade after the initiation of financial sector reforms, *i.e.*, in 1999, the NPA to advances ratio of SBI, the commercial bank with largest business share in the region, ranged from 28.5 per cent in Meghalaya to as high as about 60.0 per cent in Manipur and Nagaland, as against the banks total ratio of 15.6 per cent. Even in 2005, the NPA to advances ratio of all SCBs in four States, for which data are available, ranged from 8.4

Table 15: NPA to Advances Ratio and Recovery Rates

(in per cent)

States	NPA/Advances of SBI in 1999	NPA/Advances of SCBs in 2005	Recovery rate from PSA		Recovery from Govt. Schemes	
			1999	2005	1999	2005
1	2	3	4	5	6	7
A.P	30.5	n.a.	44.6	26	19.9	24
Assam	40.5	11.9	14.4	36	7.1	34
Manipur	59.5	14.44	4.8	37	5.4	17
Meghalaya	28.5	n.a.	31.2	49	9.9	49
Mizoram	36.7	8.35	36.7	58	17.7	58
Nagaland	59.8	14.3	11.4	46	5.3	46
Tripura	31.4	n.a.	12	30	9.3	30
All India	15.6	5.2	n.a.	n.a.	n.a.	n.a.

Source : Report of Trend and Progress of Banking in India, SLBC Agenda Notes of Respective States and Kaveri (undated mimeo).

per cent in Mizoram to about 14.5 per cent in Manipur and Nagaland, as against the national average of 5.2 per cent. These higher NPA in the region arises from very low recovery rate from priority sector advances, which accounts for bulk of the total advances in all the States. In 1999, the recovery rate for all banks including co-operatives ranged from a low of 4.8 per cent in Manipur to 45.0 per cent in Arunachal Pradesh, which is low by any standard. Improvement in the recovery rate has taken place in all the States by 2005, except Arunachal Pradesh, yet remained much to be desired ranging from 26.0 per cent in Arunachal Pradesh to 58.0 per cent in Mizoram. The recovery rate under government schemes was even lower, though it improved during 1999 to 2005 (Table 15).

The lower volume of business, higher proportion of bad loans, coupled with sparse settlement of population and growing law and order problem, to mention a few of the problems, while the banks were required to follow a stricter prudential norms, thus led to deceleration in the growth of activities of SCBs in the region.

Impediments

A number of factors which limit the credit absorption capacity, enhance the risk of default and impede increasing the outreach of banks and flow of bank credit in the region are identifiable.

Lack of adequate infrastructure in the form of roads, communications and transport and power, which restricts the movement goods and services, people, and development of a common market, has been the most important impediment to socio-economic growth of the region. Tenth Finance Commission estimated that when the national economic and social infrastructure index is 100, the index ranged from 48 in Arunachal Pradesh to 82 in Assam. Barring Assam and almost a negligible part of Nagaland, there are no rail links. Even the existing links are mostly single track, which reduces the speed drastically. Most of the national highways and the state highways continue to remain in dilapidated conditions in hilly terrains with winding roads, while district and village roads are even worse.

Agriculture sector is highly underdeveloped with production mostly for subsistence. In the plain areas, the population pressure is much higher than the national average, reflected in much lower operational size of holding. The operational holding size in Assam, Manipur and Tripura ranged from 0.60 hectare to 1.17 hectare, as against the national average of 1.41 hectare. In these three States, marginal and small operational holdings account for 44 per cent (Assam) to 76 per cent (Tripura) of the total holdings, as against the national average of 36 per cent. Small operational size of holding restricts use of modern inputs, which reduces the demand for institutional credit. Further, while the yield per hectare in the plain areas is higher than the national average (for instance foodgrain yield in Manipur and Tripura in 2000-01 was 2,305 Kgs. per hectare and 2,059 Kgs. per hectare respectively, as against the national average of 1,636 Kgs. per hectare), yield per population dependent on agriculture is not necessarily higher because of the higher population pressure. In Assam, both the yield per hectare and cultivators are lower. As a result, the available marketable surplus is lower limiting generation of cash flows. For instance, the marketable surplus ratio of rice in Assam in 2001-02 was 46 per cent, much lower than the national average of 73.6 per cent and each of the major rice producing States in the country (see GOI, 2004).

On the other hand, in the hill areas, large areas are still under shifting cultivation. Even under settled cultivation, due to topographical reasons, there are constraints to adoption of modern cultivation method, and consequently, the yield rate per hectare and per agricultural worker is much lower. In Arunachal Pradesh and Nagaland, the operational holding size is higher ranging from 3.31 hectare to 4.82 hectare, but the foodgrain yield ranged from 1,103 Kgs. per hectare to 1,550 Kgs. per hectare in 2000-01. Thus, limited marketable surplus is again generated. This is also reflected from the fact that no States in the region is self-sufficient in foodgrain production, of which rice is the major crop. Besides, inadequate post-harvest infrastructure like warehouses facility and dearth of organised market facilities under scattered production generating limited volume of outputs severely restricts the monetisation and development of agricultural sector. Despite being an agrarian economy with a higher percentage of population dependent on agriculture and allied activities, and a greater share in NSDP than the national average of 22.5 per cent (ranging from 24.21 per cent in Mizoram to 35.83 per cent in Arunachal Pradesh), demand for credit from this sector, therefore, remain limited.

Due to inadequate infrastructure, various forms of subsidy granted in separate industrial policy for the region have failed to attract outside entrepreneurs, which the few first generation local entrepreneurs can not fill. Thus, no large-scale industries in the private sector exist and the industrial sector remains underdeveloped. Consequently, the share of industry in NSDP ranged from a meagre 0.15 per cent in Nagaland to 8.96 per cent in Meghalya and 15.33 per cent in Assam, as against the national average of 20.6 per cent.

The demand for credit from real sector (agriculture and industry) is, therefore not only low, but also the economic structure is lopsided with disproportionate contribution from community, social and personal services (salaried sector) in State income, of which, public administration forms a major component. Barring Assam with 49.8 per cent, the share of tertiary sector is distinctly higher than the

national average of 57.0 per cent in all the States, ranging from 60.0 per cent in Arunachal Pradesh to as high as 74.0 per cent in Mizoram. Within the services sector, the contribution from community, social and personal services (CSS) in the NSDP ranged from 17.4 per cent in Assam to 35.2 per cent in Mizoram, as against the national average of 14.5 per cent. Within CSS, public administration is dominant in all the States, except Assam which shows the all India pattern. The share of public administration in NSDP ranged from 12.6 per cent in Nagaland to 18.2 per cent in Arunachal Pradesh, as compared to national average of 6.5 per cent only. The predominance of public administration can be gauged from the fact that it is either the second or third most important sub-sector after agriculture contributing to the State income in all the States, except Assam.

Even within the limited demand for credit due to the constraints provided by the above factors, the unique land tenure system such as community ownership in the hills, which not only leads to absence of legalised ownership rights and proper land records but also restricts alienation of land, disenables collaterisation of land for bank lending. While this problem is absent in the plain areas as inheritable rights are established, due to non-segregation of pattas on lands inherited over generations, collateralisation of land for bank lending in this area has also become a problem.

While low recovery rate would also follow from poor quality of credit, repayment culture is lacking in the region, and particularly so with government sponsored programmes. This could be the adverse fallout of grant culture in the region, which tends to imbibe a mindset to the people that any involvement of government means a grant and not a loan. In the region, there could also be other irregularities necessarily cropping up when government machinery is involved in bank financing that there is incentive for non-payment of loans. In fact, government is the main source of indebtedness of rural household in the region, ranging from 9.2 per cent in Manipur to 97.6 per cent in Mizoram, as against the national average of 6.1 per cent only. Even for the urban households, government is the main source in five States,

ranging from 11.6 per cent in Manipur to 83.1 per cent in Nagaland (AIDIS, 1991).

The above impediments have also inflicted the local formal institutions like RRBs and Cooperatives**,** which together account for more than 41.0 per cent of the bank branches. As a result, while these institutions should be in a better position than all India commercial banks to cater to the local needs, they are mostly plagued with huge accumulated losses and lack of business plans. Consequently, RRBs are unable to expand their operations and a significant number of districts (19 out of 34 districts) in Meghalaya, Nagaland and Arunachal Pradesh are still not covered by them. Similarly, six of the seven Apex banks in the region are plagued by poor governance and weak financials.

The level of awareness of people on various banking schemes is low due to socio-economic conditions and cultural factors and banks not making any conscious effort to increase it. At the same time, a matured credit culture is lacking and there is preference for hassle free informal channel instead of formal procedures of typical banking transactions that requires documentation. Lack of product differentiation and innovations to suit local conditions can be another factor for inability of the formal financial institutions to replace the traditional institutions, which are flexible and informal but trustworthy being deep-rooted as it has run through generations. For instance, in the plain areas of Manipur a Chit Fund like social institutions called 'Marup' is pervasive, which provides to the people a highly flexible alternative avenue to banks for saving and borrowing purposes. A casual observation also finds mushrooming growth of micro lending institutions in Manipur who charges exorbitant rates of interest, yet people prefer them to banks.

The consumption level is higher in the region, and consequently, rate of financial savings is low, limiting recourse to banking channel. Using NSS consumption and NSDP data from CSO, it is estimated that, in 2002-03, private consumption as a ratio to NSDP is estimated at 52.8 per cent for the region as a whole, as against the national

average of 42.3 per cent. For instance, Mizoram is one State with the highest literacy rate and the lowest APPBO, but with the highest level of consumption relative to its income, the level of current and savings accounts per 100 adult population is the third lowest among these seven States. While the socio-economic and cultural factors are important factors, lack of saving avenues due to inaccessibility to a bank branch would also encourage consumption and/or savings can take the form of non-financial assets. In this regard, as mentioned above, due to hilly terrain and the sparse settlement of population, APPBO would not fully capture the accessibility of the people to banking services.

Section IV: Summary and Concluding Remarks

From the trends in banking indicators reviewed above, the seven States in the region may be broadly classified into three sub-groups. In the first group are the Arunachal Pradesh, Meghalaya and Mizoram with low APPBO. States with medium level of APPBO are Assam and Tripura, while Manipur and Nagaland belong to the third group of very high APPBO. All the States have a much lower level of current and savings accounts, and credit accounts per 100 adult population than at the national level, but within the region, these ratios are higher in the States belonging to the first and second sub-groups. The gap in per capita deposit and credit from the national average is the least for the first group followed by the second and third group in that order. Similarly, deposit and credit to NSDP ratio follow a similar trend, though they are much lower than the national average in all the States.

The difference in CD ratio, however, does not conform to the above categorisation of States. Three States which have plain areas, *viz.,* Assam, Manipur and Tripura used to have a much higher CD ratio, about or higher than the national average, during the 1980s and the first half of the 1990s. For Assam, much of the reason for higher ratio was due to substantial inflow of credit. The remaining four hilly States had a much lower ratio during the corresponding

period. Since the mid-1990s, there has been a substantial decline in the ratio in the above three States with plain areas.

Notwithstanding the above broad categorisation differentiating the States, there was common trend of retardation in the growth of activities of SCBs in all the States during the decade of the 1990s. The number of current and savings accounts per 100 adult population (barring Assam) declined, deposit and credit growth -particularly credit- decelerated substantially, the relative gap in per capita credit and deposit, and in deposit and credit to NSDP ratio from the national average enlarged. Some reversal of this trend, however, has taken place during the last five years in most of the States. Another common trend is the much larger decline in the share of agriculture and industry in utilised credit and corresponding increase in the share of retail credit than at the national level.

Both the demand and supply gaps are important reasons for low level of financial intermediation in the region. While socio-economic and cultural factors have inhibited demand for banking services, it is important to note that poor infrastructure has been one of most important constraining factor. As Reddy (2006) notes, without real sector development in terms of physical infrastructure and improvement in supply elasticities, supply led financial intermediation can lead to misallocation of resources, potentially generate bubbles and possibly amplify the risks. Provision of these facilities will not only generate demand for rural credit (Mohan, 2006) but also improve the efficiency of supply. Much of the initiatives for development of infrastructure and formulating a development strategy to create a favourable investment climate and credit culture will have to come from the State Governments. However, these facilities could only be provided over a longer horizon.

Meanwhile, the existing supply gap in banking services need to be addressed soon.[8] For this, banks will have to innovate and adapt themselves to the given situation prevailing in the region by redesigning their products according to local demand and reach out to the people. The emphasis should be on productive sectors, as real

sector is underdeveloped and the economy is already lopsided. Owing to this lopsided nature of the economy, retail credit has shown a much higher growth in the region than at the national level, and is one of the most important reasons for the revival of credit growth in most of the States during the last five years or so. This is a national phenomenon arising from growth of consumerism, easing of lending standards by banks, comparatively lower defaults, *etc.*, (Roy, 2006). In the region, while the demand for credit to real sectors is lacking, retail credit has a ready demand due to disproportionately higher share of public administration and other services in NSDP (salaried class people), and higher level of consumption relative to income emanating from social habits. The non-requirement of immovable property such as land collateral enhances both the demand and supply for these types of loans. But, unlike in other parts of the country, such retail bank credits will not create economic activity in the region, and not sustainable, as the ensuing retail purchases will have to be sourced from elsewhere outside the region.

Though there are a number of unbanked areas, given the topography of the region with sparse settlement of population and transport bottlenecks, branch expansion may not be always feasible on account of financial viability. The alternatives to branch expansion for outreach, *viz.,* business correspondent and facilitator model is best suited for the region, as there are a number of community based organisations, NGOs and post offices (about 8,000 as compared to some odd 1,230 SCB branches), which are well dispersed in the region than bank branches. Besides, the disadvantage of topography and sparse settlement of population can be overcome through IT based solutions, as mobile connectivity has improved substantially in the region. Smart cards and mobile payments allow banking transactions from non-branch locations. The banks will, however, be required to have an IT plan at the branch level and incur initial lump sum investment for the purpose.

One important reason for the people keeping away from the banking fold is the complexities of documentation required in a typical

banking transaction. A simplified procedure is a must, which can be introduced as a pilot project in some select areas. After due customisation of simple deposit (such as 'no frills account') and credit products (like general credit card (GCC)) through awareness programmes, more areas can be covered. For familiarising these products, services of respected local persons like schoolteacher, retired official, postman, *etc.*, could be taken on commission basis. The services of these people could also be taken for recovery of loans, as their respectability among the masses could be leveraged.

The operations of banks through self help groups (SHGs) is another important route that needs to be reassessed and scaled up. SHGs movement which peaked up late is confined mostly in Assam, though rapid growth is also taking place in other States too. In general, the recovery rates have also been higher for finance to SHGs. To encourage this, banks may be allowed to refinance MFIs for SHG lending.

Given the unique land tenure system in the region, the norm on land as collateral for bank loans need to be relaxed in the region. The issue of land procession certificate (LPC) has begun by most of the States in hill areas, but falls short of legal backing. Further, lack of cadastral survey and multiplicity of authority and other complexities including limited transferability rights are inhibiting factors. A continued emphasis on such collateral by banks would hinder growth of credit in the region. The focus of the bank should be on the cash flow generating from the credit. Establishing the right to cultivate the land by the borrower should be the focus, and not on individual ownership and transferability of the land in the event of failure on loan repayment. Wherever available, LPC should serve the purpose as this is enough evidence on cultivable right of the borrower on the land. And if this is not available, a letter of comfort from the community based organisation on cultivable right of the borrower should suffice. For any viable projects in both agriculture and industry, other forms of guarantees such as primary security, personal guarantee or other trust guarantee could replace land (immovable property) collateral.

For the RRBs, besides the measures such as reassessment of staff needs, altering business strategy, implementing IT based solutions and allowing greater freedom in operations, their synergy can be achieved through amalgamation. The Assam Gramin Vikash Bank formed after amalgamation of four RRBs is now the single largest scheduled commercial bank having highest number of bank branches in Assam. The bank has achieved improved financials after amalgamation.

With regard to State co-operative banks, in addition to infusion of capital, allowing management by professionals, designing of suitable banking products and charting out a clear road map for revival, they can be considered for business correspondent on commission basis by SCBs. This arrangement can help both the parties, as the co-operatives have experience in banking transactions, are well dispersed and their financials can improve, while for the SCBs their outreach will increase.

Notes:

[1] Among the two ratios, the former ratio is also considered as one of the benchmark to assess the reach of financial services to the population (Leeladhar, 2005). These ratios are also considered as indicators of banking penetration (Mohan, 2006).

[2] Due to non-availability of data at the district level, we have considered total deposit accounts per 100 populations, instead of current and savings accounts only.

[3] We have not reported the detailed estimates to preserve space, but they are available from the authors.

[4] Thorat Committee on CD Ratio, appointed by Government of India in 2004 distinguished the importance of utilization as against sanction to measure the CD ratio of a State.

[5] Since this point is not known *a priori,* we searched it within a range of 15 per cent to 85 per cent of the sample period, which is the standard practice in the literature to locate structural breaks at an unknown point of time.

[6] For States other than Assam (545), it ranged from 262 in Mizoram to 483 in Tripura as against the national average of 518.

[7] Credit accounts per employee was however lower, except Tripura (125), and ranged from 52 in Nagaland to 66 in Manipur, against the national average of 86.

[8] Financial Sector Plan for the North Eastern Region (Usha Thorat Committee, 2006) has deliberated in great details and recommended comprehensive measures to raise the level of financial inclusion in all its aspect in the region.

References:

All India Debt and Investment Survey (1991), National Sample Survey Organisation, Government of India.

Benhabib, J. and M Spiegel (2000), "The Role of Financial Development in Growth and Investment", Journal of Economic Growth, Vol. 5, December 2000.

Boyreau-Debray, G. (2001), "Financial Intermediation and Growth: Chinese Style", World Bank, Washington, DC, 2001.

Gorton, Gary and Andrew Winton (2002), "Financial Intermediation", NBER Working Paper, No. 8928.

Government of India (2004), Agricultural Statistics at a Glance 2004, Ministry of Agriculture, August.

Kaveri V.S., (undated), "Banking in North Eastern Region- An Inter-State Analysis", North Eastern Institute of Bank Management, Guwahati (Mimeo).

Khan, M.S. and Abdelhak S Snehadji (2003), "Financial Development and Economic Growth: A Review and New Evidence", Journal of African Economies, Centre for the Study of African Economies.

King, R.G. and R. Levine (1992), "Financial Indicators and Growth in a Cross Section of Countries", World Bank Policy Research Working Paper No. 819.

King, R.G. and R. Levine (1993), "Finance and Growth: Schumpeter Might be Right", Quarterly Journal of Economics, Vol. 108, 1993.

Leeladhar, V. (2005), "Taking Banking Services to the Common Man-Financial Inclusion", Febank Hornis Memorial Foundation Lecture, Ernakulam, December 2, 2005.

Levine, R. (1997), "Financial Development and Economic Growth: Views and Agenda", Journal of Economic Literature, 35(2), 1997, pp. 668-726.

Levine, R. Norman Loayza and Thorsten Beck (1999), "Financial Intermediation and Growth: Causality and Causes", World Bank Country Economics Department Papers 2059, Washington, DC, 1999.

McKinnon, R. I. (1973), Money and Capital in Economic Development, Washington DC, Brookings Institution, 1973.

Mohan, Rakesh (2006), "Economic Growth, Financial Deepening and Financial Inclusion", Address at the Bankers' Conference 2006, Hyderbad, November 3, 2006.

Reddy, Y.V. (2006),"Globalisation, Money and Finance – Uncertainities and Dilemmas", Valedictory address at the FICCI-IBA Conference, Mumbai, September 28, 2006.

Reserve Bank of India, Basic Statistical Returns, Various Issues.

Reserve Bank of India (2006), Committee of Financial Sector Plan for North Eastern Region (Usha Thorat Committee), Mumbai.

Reserve Bank of India (2005), Handbook of Statistics of Indian Economy, 2004-05.

Roy, Mohua, (2006), "A Review of Bank Lending to Priority and Retail Sectors", Economic and Political Weekly, March 18, 2006.

Shaw, G. (1973), Financial Deepening in Economic Development, New York, Oxford University Press, 1973.

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Bancassurance : A Feasible Strategy for Banks in India ?

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This paper attempts to explore the scope for bancassurance models as feasible source of sustainable income to banking sector by exploiting the synergy in the context of India having the largest banking network on the one hand and lower insurance penetration and insurance density on the other hand. While analysing the present trend of banks handling insurance products, it also highlights some of the likely issues in general as well as specific from the point of regulator and supervisor. It concludes that going by the present pace, bancassurance would turn out to be a norm rather than an exception in future in India and it would be a 'win-win situation' for all the parties involved - the customer, the insurance companies and the banks.

JEL Classification : G21, G22

Keywords : Bancassurance, Banks in Insurance Business, Insurance penetration and density in India.

Introduction

World over the idea of separation of roles between banks and other financial activities has become redundant. Even in the United States which was known for strict separation of banking and non-banking activities during the Glass-Steagall Act regime broke the dividing wall. The post Gramm-Leach-Bliley (GLB) Act, 1999 scenario, it is stated to have indicated increased preference for banks coterminously dealing with other non-banking financial products, including the insurance products. In Asian countries (*e.g.*, Taiwan, Singapore, Japan, *etc.*) too the trend has been set towards financial supermarket. The financial liberalisation and financial innovations have drawn the worlds of banking and insurance closer together,

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desegmenting the financial industry and spurring competition (Knight, 2005). Therefore, banks dealing in insurance products have increasingly become accepted norm rather than exception.

In India, ever since espousing of financial reforms following the recommendations of First Narasimham Committee, the contemporary financial landscape has been reshaped. Banks, in particular, stride into several new areas and offer innovative products, *viz.*, merchant banking, lease and term finance, capital market / equity market related activities, hire purchase, real estate finance and so on. Thus, present-day banks have become far more diversified than ever before. Therefore, their entering into insurance business is only a natural corollary and is fully justified too as 'insurance' is another financial product required by the bank customers.

The Reserve Bank of India being the regulatory authority of the banking system, recognising the need for banks to diversify their activities at the right time, permitted them to enter into insurance sector as well. Furtherance to this line, it issued a set of detailed guidelines setting out various ways for a bank in India to enter into insurance sector (Annex I sketches out the guidelines). In the insurance sector, the Insurance Regulatory and Development Authority (IRDA), despite its recent origin in 2000, avowed to regulate and develop the insurance sector in India through calibrated policy initiatives. Given India's size as a continent it has, however, a very low insurance penetration and low insurance density. As opposed to this, India has a well entrenched wide branch network of banking system which only few countries in the world could match with. It is against this backdrop an attempt is made in this paper to explore the 'bancassurance strategy' which integrates banking and insurance sector to harness the synergy and its allied problems and prospects in the Indian context. This paper is presented in four sections purely on pedagogic basis. Section I includes introduction, and a snap shot of reforms in insurance sector in India, Section II focuses on the status of insurance penetration in India, *vis-à-vis* select countries, the concept of 'bancassurance' as a distribution strategy and draws attention to the international

experience. Section III analyses the scope for bancassurance in the Indian context from bankers and insurers' perspectives. Section IV dwells on different bancassurance models, present trend of bancassurance models in India, while it also highlights some issues in general as well as regulatory and supervisory related. Concluding remarks are presented in Section V.

Section I

Insurance Sector during Post Reforms - A snapshot

It is obvious that reforms in financial sector would not be complete if one of the key sub-sector, *viz*., insurance sector is not being taken along. Therefore, the Government of India had appointed a Committee on Reforms in the Insurance Sector under the Chairmanship of Late R.N.Malhotra (known as Malhotra Committee) in 1994. There has been considerable time lag between reforms in the insurance sector and the rest of the financial sector, particularly in comparison with the banking sector. Incidentally, the experience with many other countries were also very similar. However, following the implementation of Malhotra Committee's far reaching recommendations, the insurance sector had undergone sweeping changes during the later 1990s and 2000 onwards and of which only a few developments are highlighted here. IRDA was established in the year 2000 as an exclusive Regulatory Authority for the insurance sector through the enactment of IRDA Act, 1999. A number of amendments were brought in various insurance related statutes, *viz.*, Insurance Act, 1938, LIC Act, 1956 and General Insurance Business Nationalisation Act, 1972 (GIBA). The Progress in the overall developments in the insurance sector were swift and more prominent after the establishment of IRDA. The four public sector non-life insurance companies were de-linked from being subsidiary of the General Insurance Company of India. Now they operate independently and compete with each other. The upshot of these developments was the breakage of monopoly by public sector in the insurance sector paving the way for the entry of private entities into the insurance market and the era of competition set in with availability of wide range of insurance products in the market than ever.

Insurance Market in India - A Quick look

With the progress of reforms, Insurance market has been flooded with a number of players. As at end-March 2006, among the life insurers, there were 15[1] companies in private sector and Life Insurance Corporation of India (LIC) was the solitary public sector company. Among non-life insurers, nine companies were in private sector and four companies were in public sector (Annex II). As regarding the present size of the insurance market in India, it is stated that India accounts not even one per cent of the global insurance market. However, studies have pointed out that India's insurance market is expected to grow rapidly in the next 10 years. Mathur (2004) for instance, stated that in spite of significant growth of life insurance business through the outstanding efforts of LIC, only 25 to 26% of insurable population in India has been insured.

In terms of 'insurance penetration ratio'(defined as ratio of insurance premium to GDP), a key indicator of the spread of insurance coverage and insurance culture, India compares poorly by international standards. The penetration ratio was less than one per cent in 1990s and it improved to 4.8% by end-March 2006. As against this, a Survey Report of Swiss Re revealed that the penetration ratio as at end-March 2006, in respect of some of the European countries, *viz.,* UK and Switzerland at 16.5% and 11.0%. In Asia, Taiwan and South Korea had registered their respective ratio of as high as 14.5% and 11.1%. Insurance Penetration ratio for the World was placed at 7.5% far greater than that of India (Table 1).

Thus in a country with more than 1.2 billion population, the poor penetration ratio indicates that a vast majority of population remain outside the reach of the insurance, especially in rural and semi-urban areas, in the context of the absence of social security schemes. This clearly suggests the presence of vast potential for tapping the insurance market particularly by widening the distribution channels. This is where the strategy of bancassurance could possibly become more relevant.

Table 1: Insurance Penetration – International Comparison-2006 (Select European and Asian countries)

Countries	Insurance Penetration # (Per cent)		
	Life	Non-life	Total
1	2	3	4
European Countries			
U K	13.1	3.4	16.5
Switzerland	6.2	4.9	11.1
France	7.9	3.1	11.0
Ireland	7.9	2.5	10.4
Nederland	5.1	4.3	9.4
Belgium	6.5	2.7	9.2
Portugal	6.1	2.9	9.0
Germany	3.1	3.6	6.7
Asian Countries			
Taiwan	11.6	2.9	14.5
South Korea	7.9	3.2	11.1
Japan	8.3	2.2	10.5
Hong Kong	9.2	1.2	10.4
Singapore	5.4	1.1	6.5
Malaysia	3.2	1.7	4.9
PR China	1.7	1.0	2.7
India	**4.1**	**0.7**	**4.8**
World	**4.5**	**3.0**	**7.5**
U.S.A	4.0	4.8	8.8
Canada	3.1	3.9	7.0

: Insurance penetration is measured by the ratio of insurance premium to GDP (in per cent).
Source: Swiss Re.

Section II

This section discusses the concept of bancassurance and international experience mainly focused to select European countries.

Bancassurance Strategy – The Concept

Bancassurance, *i.e.*, banc + assurance, refers to banks selling the insurance products. Bancassurance term first appeared in France in 1980, to define the sale of insurance products through banks' distribution channels (SCOR 2003). This term is extremely familiar

among the European countries as banks selling insurance products in most of these countries are a common feature. Banks are being used as an effective alternate channel to distribute insurance products either as 'stand-alone insurance products' or 'add-ons to the bank products' by way of combining the insurance with typical banking products/services. According to IRDA, 'bancassurance' refers to banks acting as corporate agents for insurers to distribute insurance products. Literature on bancassurance does not differentiate if the bancassurance refers to selling of life insurance products or non-life insurance products. Accordingly, here 'bancassurance' is defined to mean banks dealing in insurance products of both life and non-life type in any forms. Banks in Europe though predominantly deal with life insurance products, they are also channeling the non-life insurance products. It is also important to clarify that the term bancassurance does not just refer specifically to distribution alone. Other features, such as legal, fiscal, cultural and/or behavioural aspects also form an integral part of the concept of bancassurance (SCOR 2003). Quite reverse of the concept of bancassurance, there is also a concept known as 'assure banking' which refers to the provision and distribution of financial and banking services by insurance companies.

International line - Select European Countries

The strategy of bancassurance has been highly successful in Europe, especially France and Portugal stated to be most successful in bancassurance wherein as much as 70 % of the insurance products were sold through the banking channel alone followed by Spain where more than 59 % of the insurance products were being sold through the banks. In countries such as Belgium and Italy, though the bancassurance concept has been in prevalence for some years but seems to be picking up only since the late 1990s. As opposed to the above, in the UK and the Netherlands the concept of bancassurance stated to be relatively less popular although banks sell the insurance products. In Germany although the system of universal banking is predominant, bancassurance does not seem to have showed up a big stride.

Table 2 : Bancassurance as Distribution Channel for Life Insurance Products in Select European Countries

(in per cent)

Countries #	Proportion of insurance products distributed by banks
1	2
France	70
Portugal	69
Spain	63
Belgium	42
Ireland	30
Sweden	22
Nederland	18
UK	12

 # : Data relates to the year 2000.
Source : (Sigma 2002), Swiss Re.

Most important factors for the success or otherwise of bancassurance in most of these countries cited in the literature is the favourable legal system in the respective country, supported by the availability of strong banking infrastructure coupled with the banking culture. The system of 'relationship banking' stated to have contributed amply in building up of bancassurance. It may be pointed out that a flexible banking system catering to understand the needs and requirements of the customers intimately is considered to be best suited for bancassurance. In other words, 'stronger the bank - customer relationship' higher the prospects for bancassurance. Above all, the reputation of the banks were also stated to have played a key role in popularising the concept of bancassurance in Europe. Fiscal factors in the form of tax incentives also played crucial role in some countries such as France (SCOR, 2003). Literature has also amply pointed out that besides diversifying their activity and optimizing the choice of products, bancassurance have contributed sizably to the banks' earnings in European countries especially when there was tremendous pressure on the banks' net interest margin due to stiff competition in the banking industry. Moreover, as the banking system in most of the European countries have reached a state of saturation with the traditional banking activities 'bancassurance' helped them in great deal to diversify their activity and also stated to have lent a

helping hand to the banks to retain their customers' loyalty. It also equally helped the insurance companies to spread out their market network at relatively shorter time, efforts and above all with lower cost. Interestingly, regarding risk perception, Genetay and Molyneux (1998) had concluded that bancassurance expansion does not threaten with higher risk positions for banking institutions and instead, at the least, it may even result in reducing the risk position mildly. This is quite contrary to the general risk perception about banks involving in insurance business.

The flip side of the bancassurance as revealed by the international experience, are that, as some of the products of insurance, especially from the long term savings point of view, resemble closely that of the term deposits of the banks, there was apprehension that insurance products would supplant the bank products instead of supplementing. There has also been problem that not all the insurance products, the banks could market, in the European countries at least in the initial stage. Furthermore, there were also resistances, in the initial stages, from the insurance agents/ brokers due to apprehension of loss of business for them by channeling insurance products through banks. There was, of course, the issue of 'conflict of interest' within the financial sector. Partly all these could have contributed for the less success of 'bancassurance strategy' even among some of the European countries, as pointed out earlier. Nevertheless, bancassurance, by and large, has been successful among a number of European countries, and recent studies have pointed out that similar trend is being witnessed even among some of the Asian and Latin American countries. The apprehension that through bancassurance, the possibility of migration of risks arising out of insurance business to banking activities/ system still persists, despite studies by Graham and Boyd (1988) and Genetay and Molyneux (1998) had concluded with reassuring results, *viz.*, banks diversification into insurance business would only stand to gain in terms of risk/ return benefits.

Section – III
Bancassurance in India

With the above backdrop attempt is made here to analyse the scope for bancassurance in India focused mainly from the bankers'

perspective, though issues arising from the points of view of insurance and customers were also being discussed.

Present Distribution Channels for Insurance Products in India

Insurance industry in India for fairly a longer period relied heavily on traditional agency (individual agents) distribution network IRDA (2004). As the insurance sector had been completely monopolised by the public sector organisations for decades, there was slow and rugged growth in the insurance business due to lack of competitive pressure. Therefore, the zeal for discovering new channels of distribution and the aggressive marketing strategies were totally absent and to an extent it was not felt necessary. The insurance products, by and large, have been dispensed mainly through the following traditional major channels: (1) development officers, (2) individual agents and (3) direct sales staff. It was only after IRDA came into existence as the regulator, the other forms of channels, *viz.*, corporate agents including bancassurance, brokers (an independent agent who represents the buyer, rather than the insurance company, and tries to find the buyer the best policy by comparison shopping[2]), internet marketing and telemarketing were added on a professional basis in line with the international practice. As the insurance sector is poised for a rapid growth, in terms of business as well as number of new entrants tough competition has become inevitable. Consequently, addition of new and more number of distribution channels would become necessary.

Scope for Bancassurance in India

By now, it has become clear that as economy grows it not only demands stronger and vibrant financial sector but also necessitates to provide with more sophisticated and variety of financial and banking products and services. Krueger (2004) pointed out that the history of the North America is a case in reference of one of financial strengthening and deepening in tandem with economic growth. As India is being considered one of the fast developing economy among the emerging market economies, financial sector has also grown much vibrant with the financial reforms. In fact, in recent years, it is surmised

that even the 'global economic growth' hinges on growth prospects of the emerging economies like China and India to a greater extent. Significantly, Indian economy has recorded an average growth of over 8.5 per cent for the last four years, with macroeconomic and financial stability (RBI, 2006) and indications are that it may grow at even better rate in the near future provided there is good monsoon. Experience also showed that economic growth had strongly supported the expansion of middle income class in most of the Asian countries, and now it is the turn of India. Experience reveals that at the initial growing stage of the economy the primary financial needs are met by the banking system and thereafter as the economy moves on to higher pedestal, the need for the other non-banking financial products including insurance, derivatives, *etc.,* were strongly felt. Moreover, as India has already more than 200 million middle class population coupled with vast banking network with largest depositors base, there is greater scope for use of bancassurance. For instance as at end March 2005, there were more than 466 lakh bank accounts with scheduled commercial banks. It is worth being noted that, Swiss Re (2002) in its study on Asia pointed out that bancassurance penetration is expected to tangibly increase in Asia over next 5 years and this has been greatly proved.

In simple words, it is aptly put that bancassurance has promised to combine insurance companies' competitive edge in the "production" of insurance products with banks' edge in their distribution, through their vast retail networks (Knight, 2006).

i) Bankers' Perspective

In the post reforms, the financial sector has more number of players of both domestic and foreign and the dividing line between the banks and non-banking financial institutions' activities had considerably thinned down. Overlapping in one another's functions/ areas have become more common than exception. The direct upshot of these developments led to intensive competition in the banking sector and which in turn had a strong bearing on the banks' net interest margin (spread). In fact the emerging scenario is likely to bring down the banks' spread even thinner. As it can be seen from the Table 3 that the spread ratio has considerably come down cutting across all

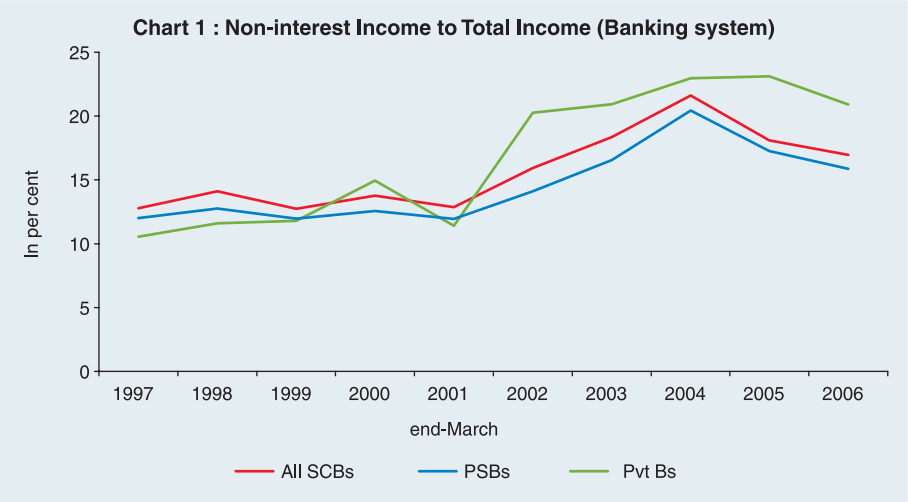
Table 3 : Interest Spread for Bank Groups in India
(Net interest margin as per cent to total assets)

Bank Group	1990-91	2003-04	2004-05	2005-06
1	2	3	4	5
Public Sector Banks	3.22	2.97	2.90	2.72
Private Sector Banks	4.02	2.18	2.34	2.30
Foreign Banks	3.92	3.46	3.33	3.51
Total Banking System*	3.31	2.86	2.83	2.78

* : includes all scheduled commercial banks.
Source : RBI publications.

the banking groups. For the banking system (scheduled commercial banks) the spread ratio decelerated from 3.31 per cent at end-March 1991 to 2.78 per cent at end-March 2006. In the case of Indian private sector banks it declined sharply from as high as 4.02 per cent at end-March 1991 to 2.30 per cent at end-March 2006. Public sector banks are no exception, despite their monstrous size, they registered a decline in spread ratio from 3.22 per cent to 2.72 per cent during the same period. Foreign banks operating in India were always known for the higher spread than the rest, even their spread had decelerated from 3.92 per cent to 3.51 per cent. Therefore, banks were compelled to be constantly on the look out for a stable alternate sources of earnings in the form of non-traditional and fee based sources of incomes.

Banks' response to these developments has been to migrate towards newer and non-traditional areas of operations especially relating to fee based activities / non-fund based activities. This is reflected in the sharp increase of proportion of non-interest income to total income in recent years (Chart 1). Further, banking system in India was prone to very high NPAs, the net NPA ratio of banking sector was as high as 15.7 per cent at end-March 1997, which, with concerted efforts declined sharply to around 1.20 per cent by end-March 2006. Although this was an unprecedent achievement in the Indian banking industry, diversification towards new areas such as bancassurance, promises greater scope for further enhancement in earnings with no menace of increase in NPAs. In the ensuing paradigm, the banking sector irrespective of public or private sector and foreign or domestic banks', their increased reliance on the non-fund based business activities would become inevitable.



Persistent endeavor in scouting for new technology, new products/ services/ new avenues, has become necessary for the growth as well as sustainability of banking system. It is in this context possibly, bancassurance could well be an appropriate choice for banks to increase their stable source of income with relatively less investments in the form of new infrastructure.

As far as banking sector's infrastructure is concerned, only a few countries could match with India for having largest banking network in terms of bank branches spreading almost throughout the length and breadth of the country. This is a direct outcome of the then prevailing deliberate policy thrust towards branch expansion. At end-March 2006, we have as many as 284 scheduled banks, of which 88 are commercial banks and 196 are Regional Rural Banks (RRBs). There are as many as 70,324 bank offices, of which, nearly 70% of the branches are located in rural and semi urban areas and the remaining around 30% are in urban and metropolitan areas. The population served by a bank office worked out to be around 16000 people at end-March 2006. Besides the commercial banking system, India has a large rural credit cooperatives as also urban cooperative banking network. Taken together these institutional set up, the ratio of population served by a bank branch would work out to be far lower. Thus, on the one hand we have a very low insurance penetration and

low insurance density[3] as compared with the international standards, on the other hand, India has a widely stretched and well established banking network infrastructure. It is this contrasting situations to assimilate the two systems by way of 'bancassurance strategy' to reap the benefits of synergy. This is an opportune time for both banking and the insurance sectors to come closer and forge an alliance for the mutual benefit. For, both the regulators, *i.e.*, RBI and IRDA have already proffered appropriate policy guidelines and set in a congenial environment for such an endeavor. Besides, the Government of India's unequivocal policy to provide insurance cover to the low income households and the people at large at a minimum cost are also favourable.

Moreover, going by the present trend of mergers and acquisition and consequent consolidation, the emergence of financial supermarkets and financial conglomerates could not be ruled out in India, therefore bancassurance could as well be one more financial activity of the banks. There is also one more dimension to this activities, unlike the normal banking activities, international experience showed that bancassurance helped the banks to have a non-volatile source of income. Above all, in India still vast majority of banking operations are conducted through the manual operations at the banks' branch level with relatively less automation such as ATMs, tele-banking, internet banking, *etc.*, unlike many developed countries. This stands out as an added advantage for the banks to have direct interface with the customers, to understand their needs/ tastes and preferences, *etc.*, and accordingly customize insurance products. In fact there are also greater scope for innovation of new insurance products in the process. Bancassurance would therefore be uniquely suited to exploit the economies of scope for the banks in India. Bancassurance also becomes a blessing in disguise from the point of view of CRAR. Significantly, even customers stated to be preferring for banks entering into insurance. For instance, a survey conducted by FICCI revealed that 93 per cent of the respondents have preferred banks selling insurance products. Therefore bancassurance can be a feasible activity and viable source of additional revenue for the banks.

Studies have also portrayed that adding life insurance activities to banking operations allowed banks to increase their assets under management substantially and to diversify their earnings.

ii) Insurers' Perspective

Contemporaneously, with the sweeping financial reforms in the insurance sector and the consequent opening up of this sector, all the private entities plunged almost simultaneously with a very little spacing of time and the entire insurance sector has been exposed to stiff competition. A number of foreign insurance companies in both life and non-life segment have entered by way of joint ventures with an equity stake of upto 26 per cent in the local companies[4]. IRDA had reported that as much as Rs. 8.7 billion was brought in by these companies by way of foreign investments, with the extant provision of 26 per cent foreign capital. In the context of Indian insurance market being growing at an annual rate of 21.9 per cent (IRDA, 2005), any increase in the foreign participation in the capital would only intensify the competition with more number of fresh entrants, given the better growth prospects.

Life Insurance Segment

Life insurance market recorded a premium income of Rs.1,05,875.8 crore during the year 2005-06 as against Rs.82,854.8 crore during the last year recording a growth of 27.78 per cent . Sector-wise, private insurers together registered a growth of 95.19 per cent on top of 147.65 per cent recorded last year, while public sector, *viz.*, LIC recorded a growth of 20.85 per cent on top of 18.25 per cent (larger base) during the same period. Till recently the entire life insurance business in India was with the public sector, whose share has, however, come down sharply in recent years. In terms of gross premium underwritten, its market share has come down from around 95 per cent at end-March 2005 to 91 per cent by end-March 2006. In terms of first year premium LIC's share has come down sharply to 64.52 per cent from 73.41per cent during the same period reflecting tremendous pressure built up by the competition.

Non-Life Insurance Segment

The non-life insurance segment registered a growth of 16.46% from Rs. 17,480.59 crore at end-March 2005 to Rs.20,359 crore at end-March 2006. Falling in line with the trend observed in Life insurance, the non-life segment also showed sizable decline in the share of the public sector insurers to 73.66 per cent at end-March 2006 from 80.0 per cent in the previous year. The private sector insurers gaining the momentum at a greater speed, because of their aggressive marketing strategy coupled with offer of wider choice of innovative products.

It is significant to note that, of the total new policies issued, in respect of both life and non- life insurers, the share of private sector has sharply increased and correspondingly the public sector insurers' share has declined (Table 4). This implies that the freshers showing increased preferences towards the private sector insurers.

Nevertheless, the existing insurance business is by and large concentrated in and around the towns, cities and metros and still a vast majority of rural areas and even people in urban unorganised sector are yet to be covered. In India, especially the absence of proper social security schemes even more emphasizes the necessity for insurance coverage. It may be pointed out that, though the Insurance density ratio increased three fold from Rs. 370.80 at end-March 2000 to Rs. 1,140 as at end-March 2006, and similarly the Insurance penetration ratio increased from 1.9 to 4.8 per cent during the same period (Table 5), these ratios, however compare poorly with majority of the countries around the World including many countries in Asia.

Table No. 4 : New Policies Issued by Insurers in India

(percentage share)

	Life Insurance			Non Life		
	2003-04	**2004-05**	**2005-06**	**2003-04**	**2004-05**	**2005-06**
1	2	3	4	5	6	7
Public Sector	94.21	91.48	89.08	92.09	89.19	83.08
Pvt Sector	5.79	8.52	10.92	7.91	10.81	16.92

Source *:* IRDA Annual Reports.

Table 5 : Select Indicators of Insurance Business in India

Year	Insurance Density* (Rs)			Insurance penetration**(%)		
	Life	Non-life	Total	Life	Non-life	Total
1	2	3	4	5	6	7
1999-00	274.72	96.09	370.80	1.41	0.49	1.90
2000-01	342.48	98.99	441.47	1.66	0.48	2.14
2001-02	483.07	122.42	605.49	2.18	0.55	2.73
2002-03	528.32	135.90	664.22	2.27	0.58	2.86
2003-04	617.78	161.76	779.54	2.53	0.65	3.17
2004-05	760.14	160.37	920.51	2.65	0.56	3.21
2005-06	956.42	183.91	1140.00	4.10 $	0.70 $	4.80 $

* : It refers to Insurance premium per capita *i.e.*, total insurance premium income/population.
** : Premium as percentage to GDP.
$: The source for this data Swiss Re.
Note : Density of insurance for 2003-04 onwards has been worked out based on Mid-year population.
Source : IRDA, Annual Report, various issues.

The success or otherwise of any new business/ products/ service depends on how quickly and widely it reaches out to the customers/ potential customers. This holds good even for insurance products, the insurance companies can reach out the entire country at a greater speed with less cost through bancassurance. This has already been proved in India, to a significant extent. For instance, till banks were legally not permitted to deal in insurance products, the insurance penetration ratio was appallingly lower, and it was only after the passage of the Insurance Bill and the subsequent amendments to BR Act permitting the banks to deal in insurance products that the penetration ratio in general increased sharply in a short period as exhibited in Table 5.

The foremost advantage for insurers being that they will have the direct access to the large customer base, at relatively faster rate and at the lowest cost. Banks' prior knowledge about the customers and their financial standing and other background is a gold mine for the insurers not only to tap the market but also would help to device the products that suits customers the most. In fact studies in Europe have proved that bancassurance strategy had saved the cost to insurers to a greater extent. In one of the study by Swiss Re, it was observed that for the insurers, bancassurance have resulted in cost saving to the tune of 21.2 per cent

and the expected revenue gain of 4.4 per cent (Sigma No 7, 2002). McKinsey in one of its study, also estimated a boost of 20 to 25 per cent increase in the life insurance business if its routed through banking network in US.

In the Indian case it would be all the more true, as not every new insurer had the advantage of being a subsidiary to the parent who happened to be a large commercial bank like SBI Life, HDFC Chubb and ICICI Prudential Insurance. All the insurers in private sector established in India have greatly benefited through collaborative arrangements with one or the other bank to reach the clients base without a huge investment in the form of infrastructure, as banks were already well established with a large branch network. Thus, *a la* Swiss Re green field start-up operations will be easier without even need to recruit a large number of insurance agents. Insurance companies at best needs to invest only on training the frontline bank staff that too in the case of corporate agency. In the case of referral arrangements, insurers' own agents could act upon the clients data base supplied by the banks. Possibilities of cost saving and expected revenue gain for insurance companies thus are high. Experience of banks' staff in understanding their clients' requirements would help the insurer in greater deal to innovate new products or to improvise the existing products at a greater speed.

For the insurance sector, it is now the most congenial policy environment to adopt bancassurance as IRDA has been encouraging banking institutions and the corporate sector to actively take part in the distribution system of insurance products by palliative changes in the earlier guidelines which required the Directors of the corporate agency to undergo the necessary training, *etc.* Similarly RBI as the regulator of banking system had smoothened the way for the banks to enter the insurance activities. The Central Government also took a number of proactive measures which, *inter alia,* are necessary amendments in the Banking Regulation Act, 1949 and other insurance related Acts so as to enable the banks and insurance sector to come closer and synchronize legitimately each other's activities. Thus it is a great opportunity for both banking system and the insurance sector to take advantage by acting swiftly. The present regulatory requirements of the

insurance companies is that a certain proportion of sales should be met with the rural and social sector. This gives an added advantage for the insurance companies to seek the help of banking network for their strong and wider rural and semi urban branch network.

Bancassurance – What is in store for Customers ?

The most immediate advantage for customers is that, in insurance business the question of trust plays a greater role, especially due to the inbuilt requirement of a long term relationship between the insurer and the insured. In India, for decades, customers were used to the monopolistic attitude of public sector insurance companies, despite there were many drawbacks in their dealing, they enjoyed customer confidence, this trend continues even now mainly due to their Government ownership. The customers to move over to private insurance companies that are collaborated with foreign companies which are less known to the Indian public would take little more time. The void between the less known newer private insurance companies and the prospective insured could be comfortably filled by the banks because of their well established and long cherished relationship. Under these circumstances, any new insurance products routed through the bancassurance channel would be well received by the customers. Above all, in the emerging scenario, customers prefer to have a consolidation and delivery of all financial services at a single window in the form of 'financial super market', irrespective of whether financial or banking transactions, because such availability of wide range of financial/ banking services and products relieves the customers from the painstaking efforts of scouting for a separate dealer for each service/ product. Even internationally, the trend is towards the 'one-stop-shop'. Customers could also get a share in the cost savings in the form of reduced premium rate because of economies of scope, besides getting better financial counseling at single point. Even in the case of developed countries the financial literacy and financial counseling has been increasingly stressed in recent years, these become essential especially when decision involves long term investments. In India, recently Reddy (2006) has been emphasising on the importance and necessity for financial

counseling and financial literature. In that context too the bankers are better placed in extending such counseling or financial advises to the customer because of their well established long cherished relationship. The relationship between insurer and insured and bank and its client are different, the former involves taking decisions for long term parting of money, in such cases counseling is necessary, here too the bancassurance can be of reassuring for the customer.

Section IV
Bancassurance Models

I. Structural Classification

a) Referral Model

Banks intending not to take risk could adopt 'referral model' wherein they merely part with their client data base for business lead for commission. The actual transaction with the prospective client in referral model is done by the staff of the insurance company either at the premise of the bank or elsewhere. Referral model is nothing but a simple arrangement, wherein the bank, while controlling access to the clients data base, parts with only the business leads to the agents/ sales staff of insurance company for a 'referral fee' or commission for every business lead that was passed on. In fact a number of banks in India have already resorted to this strategy to begin with. This model would be suitable for almost all types of banks including the RRBs /cooperative banks and even cooperative societies both in rural and urban. There is greater scope in the medium term for this model. For, banks to begin with resorts to this model and then move on to the other models.

b) Corporate Agency

The other form of non-risk participatory distribution channel is that of 'corporate agency', wherein the bank staff is trained to appraise and sell the products to the customers. Here the bank as an institution acts as corporate agent for the insurance products for a fee/ commission. This seems to be more viable and appropriate for most of the mid-sized banks in India as also the rate of commission would be relatively higher than the referral arrangement. This,

however, is prone to reputational risk of the marketing bank. There are also practical difficulties in the form of professional knowledge about the insurance products. Besides, resistance from staff to handle totally new service/product could not be ruled out. This could, however, be overcome by intensive training to chosen staff packaged with proper incentives in the banks coupled with selling of simple insurance products in the initial stage. This model is best suited for majority of banks including some major urban cooperative banks because neither there is sharing of risk nor does it require huge investment in the form of infrastructure and yet could be a good source of income. Bajaj Allianz stated to have established a growth of 325 per cent during April-September 2004, mainly due to bancassurance strategy and around 40% of its new premiums business (Economic Times, October 8, 2004). Interestingly, even in a developed country like US, banks stated to have preferred to focus on the distribution channel akin to corporate agency rather than underwriting business. Several major US banks including Wells Fargo, Wachovia and BB &T built a large distribution network by acquiring insurance brokerage business. This model of bancassurance worked well in the US, because consumers generally prefer to purchase policies through broker banks that offer a wide range of products from competing insurers (Sigma, 2006).

c) Insurance as Fully Integrated Financial Service/ Joint ventures

Apart from the above two, the fully integrated financial service involves much more comprehensive and intricate relationship between insurer and bank, where the bank functions as fully universal in its operation and selling of insurance products is just one more function within. Where banks will have a counter within sell/market the insurance products as an internal part of its rest of the activities. This includes banks having a wholly owned insurance subsidiaries with or without foreign participation. In Indian case, ICICI bank and HDFC banks in private sector and State Bank of India in the public sector, have already taken a lead in resorting to this type of bancassurance model and have acquired sizeable share in the insurance market, also made a big stride within a short span of time. The great advantage of

this strategy being that the bank could make use of its full potential to reap the benefit of synergy and therefore the economies of scope. This may be suitable to relatively larger banks with sound financials and has better infrastructure. Internationally, the fully integrated bancassurance have demonstrated superior performance (Krishnamurthy, 2003). Even if the banking company forms as a subsidiary and insurance company being a holding company, this could be classified under this category, so long as the bank is selling the insurance products along side the usual banking services. As per the extant regulation of insurance sector the foreign insurance company could enter the Indian insurance market only in the form of joint venture, therefore, this type of bancassurance seems to have emerged out of necessity in India to an extent. There is great scope for further growth both in life and non-life insurance segments as GOI is reported have been actively considering to increase the FDI's participation to the upto 49 per cent.

II. Product-based Classification

i) Stand-alone Insurance Products

In this case bancassurance involves marketing of the insurance products through either referral arrangement or corporate agency without mixing the insurance products with any of the banks' own products/ services. Insurance is sold as one more item in the menu of products offered to the bank's customer, however, the products of banks and insurance will have their respective brands too, *e.g.*, Karur Vysya Bank Ltd selling of life insurance products of Birla Sun Insurance or non-life insurance products of Bajaj Allianz General Insurance company.

ii) Blend of Insurance with Bank Products

With the financial integration both within the country and globally, insurance is increasingly being viewed not just as a 'stand alone' product but as an important item on a menu of financial products that helps consumers to blend and create a portfolio of financial assets, manage their financial risks and plan for their financial security and well being (Olson 2004). This strategy aims at

blending of insurance products as a 'value addition' while promoting its own products. Thus, banks could sell the insurance products without any additional efforts. In most times, giving insurance cover at a nominal premium/ fee or sometimes without explicit premium does act as an added attraction to sell the bank's own products, *e.g.*, credit card, housing loans, education loans, *etc.* Many banks in India, in recent years, has been aggressively marketing credit and debit card business, whereas the cardholders get the 'insurance cover' for a nominal fee or (implicitly included in the annual fee) free from explicit charges/ premium. Similarly the home loans / vehicle loans, *etc.,* have also been packaged with the insurance cover as an additional incentive.

III. Recent Trend of Bancassurance in India

Bancassurance proper is still evolving in Asia and this is still in infancy in India and it is too early to assess the exact position. However, a quick survey revealed that a large number of banks cutting across public and private and including foreign banks have made use of the bancassurance channel in one form or the other in India. Banks by and large are resorting to either 'referral models' or 'corporate agency' to begin with. Banks even offer space in their own premises to accommodate the insurance staff for selling the insurance products or giving access to their clients database for the use of the insurance companies. As number of banks in India have begun to act as 'corporate agents' to one or the other insurance company, it is a common sight that banks canvassing and marketing the insurance products across the counters. The present IRDA's regulation, however, restricts bankers to act as a corporate agent on behalf of only one life and non-life insurance company.

In the case of ICICI-Prudential Life Insurance company, within two years of its operations, it could reach more than 25 major cities in India and as much as 20 per cent of the life insurance sale are through the bancassurance channel (Malpani 2004). In the case of ICICI bank, SBI and HDFC bank insurance companies are subscribers of their respective holding companies. ICICI bank sells its insurance products practically at all its major branches, besides it has

bancassurance partnership arrangements with 19 other banks as also as many as 200 corporate tie-up arrangements. Thus, among the private insurance companies, ICICI Prudential seem to exploit the bancassurance potential to the maximum. ICICI stated that Bank of India has steadily grown the life insurance segment of its business since its inception. ICICI prudential had also reported to have entered into similar tie-ups with a number of RRBs, to reap the potential of rural and semi-urban. In fact, it is a step in the right direction to tap the vast potential of rural and semi-urban market. It will not be surprising if other insurance companies too follow this direction.

Aviva Insurance had reported that it has tie-ups with as many as 22 banking companies, which includes private, public sector and foreign banks to market its products. Similarly, Birla Sun Life Insurer reported to have tie-up arrangements with 10 leading banks in the country. A distinct feature of the recent trend in tie-up arrangements was that a number of cooperative banks have roped in with bancassurance arrangement. This has added advantage for insurer as well as the cooperative banks, such as the banks can increase the non-fund based income without the risk participation and for the insurers the vast rural and semi-urban market could be tapped without its own presence. Bancassurance alone has contributed richly to as much as 45 per cent of the premium income in individual life segment of Birla Sun Life Insurer (Javeri, 2006).

Incidentally even the public sector major LIC reported to have tie-up with 34 banks in the country, it is likely that this could be the largest number of banks selling single insurance company's products. Ironically, LIC also has the distinction of being the oldest and the largest presence of its own in the country. SBI Life Insurance for instance, is uniquely placed as a pioneer to usher bancassurance into India. The company has been extensively utilising the SBI Group as a platform for cross-selling insurance products along with its numerous banking product packages such as housing loans, personal loans and credit cards. SBI has distinct advantage of having access to over 100 million accounts and which provides it a vibrant and largest customer base to build insurance selling across every

region and economic strata in the country. In 2004, the company reported to have became the first company amongst private insurance players to cover 30 lakh lives.

Interestingly, in respect of new (life) business bancassurance business channel is even greater than the size of direct business by the insurers at 2.17 per cent. Even in respect of LIC around 1.25 per cent of the new business is through bancassurance. Considering the large base, even this constitutes quite sizeable to begin with in the case of LIC. This speaks for itself the rate at which the bancassurance becoming an important channel of distribution of insurance products in India. It is significant to note that the public sector giant LIC which has branches all over India, too moving towards making use of bancassurance channel.

It is significant to note that in the Indian case, all those insurers and banks who have taken the lead in identifying the bancassurance channel, at the early stage, are now reaping the maximum benefits of deeper existing customer relationship as also wider coverage of newer customers besides enhancing fee based income. During 2005-06, as much as 16.87 per cent of new business were underwritten through banks as corporate agent channel alone as compared with 6.61% through direct business (Table 6). However, banks as referrals taken together has sizeable chunk of business. This growth was primarily due to the aggressiveness witnessed in the private life insurance sector and one of the drivers for this

Table 6 : New Business (Life) Undertaken through various Intermediaries : 2005-06

(Per cent)

Insurers	Individual agents	Corporate Agents		Brokers	Referrals	Direct Business
		Banks	Others			
1	2	3	4	5	6	7
Private Insurers	59.71	16.87	8.92	0.83	7.06	6.61
LIC	98.37	1.25	0.32	0.06	0.00	0.00
Total	85.67	6.38	0.31	0.31	2.32	2.17

Source : IRDA, Annual Report, 2005-06.

substantial growth is the contribution of the banking industry (Financial Express January 1, 2006).

Bancassurance in India – Some Issues

The difference in working style and culture of the banks and insurance sector needs greater appreciation. Insurance is a 'business of solicitation' unlike a typical banking service, it requires great drive to 'sell/ market the insurance products. It should, however, be recognized that 'bancassurance' is not simply about selling insurance but about changing the mindset of a bank. Moreover, in India since the majority of the banking sector is in public sector and which has been widely disparaged for the lethargic attitude and poor quality of customer service, it needs to refurbish the blemished image. Else, the bancassurance would be difficult to succeed in these banks. Studies have revealed that the basic attitudinal incompatibility on the part of employees of banks and insurance companies and the perception of customers about the poor quality of banks had led to failures of bancassurance even in some of the Latin American countries.

There are also glitches in the system of bancassurance strategy in the form of 'conflict of interests', as some of the products offered by the banks, *viz.,* 'term deposits' and other products which are mainly aimed at long term savings/ investments can be very similar to that of the insurance products. Banks could as well feel apprehension about the possibility of substitution effect between its own products and insurance products and more so, as a number of insurance products in India come with an added attraction of tax incentives.

In case the Bancassurance is fully integrated with that of the banking institution, it is suitable only for larger banks, however, it has other allied issues such as putting in place 'proper risk management techniques' relating to the insurance business, *etc.*

As there is a great deal of difference in the approaches of 'selling of insurance products' and the usual banking services- thorough understanding of the insurance products by the bank staff coupled with extra devotion of time on each customer explaining in detail of each product's intricacies is a prerequisite. Moreover, insurance products have

become increasingly complex over a period of time, due to improvisation over the existing products as well as due to constant innovation of new products, emanating from the excessive competition adding to even more difficulties in comprehension of the products and marketing by the bank staff. These can result in resistance to change and leading to problems relating to industrial relations.

Unlike, the banking service, there is no guarantee for insurance products that all efforts that a bank staff spends in explaining to a customer would clinch the deal due to the very nature of the insurance products. This frustration of the bank staff has the danger of spill over effect even on their regular banking business.

Bankers in India are extremely naïve in insurance products as there were no occasions in the past for the bankers to deal in insurance products, therefore they require strong motivation of both monetary and non monetary incentives. This would be more so in the emerging scenario due to complex innovations in the field of insurance / pension products at a rapid pace with the entry of a number of foreign insurance companies with vast experience in the developed countries' framework.

In view of the above, reorientation of staff in the public sector banks in particular, to be less bureaucratic and more customer friendlier would indeed be a challenging task, *albeit* it is a prerequisite for the success of bancassurance.

With the financial reforms and technological revolution embracing the financial system, there has been a great deal of flexibility in the mind set of people to accept change. The above outlined problems need not, however, deter the banking sector to embark on bancassurance as any form of resistance from the bank employees could be tackled by devising an appropriate incentive system commensurate with intensive training to the frontline bank staff.

Regulatory and Supervisory Issues

With the increased structural deregulation within the financial system and globalisation the banking system in India has been

exposed to tough competition compelling them to move towards not only new vistas of business activity under one roof by moving towards the 'universal banking framework' and eventually the emergence of financial conglomerate. Such developments bring along some regulatory and supervisory concerns. Banks have all along been functioning strictly on a 'traditional banking style' with highly compartmentalised manner. Now that the banking system enjoys more of 'structural freedom' exposing themselves to non traditional activities such as insurance, derivatives, investments banking, *etc.*, there is possibility of migration of risks from the rest of the activities to the banking system. Thus, the increased market integration and globalisation are demanding new realism on the part of the regulator and supervisor for more stricter prudential regulation and supervisor on 'inter-sector' activities especially, considering the pace with which the system is moving. This process is referred in the literature as 'structural deregulation' and 'supervisory re-regulation'. While it is inevitable that Indian banks entering into insurance sector, given the size of the transactions in 'general insurance transactions', coupled with the type of built-in risks on the one side and that the banking system being the focal point of the payment and settlement on the other, any migration from the former to the latter will have a greater systemic implications. Therefore adequate and appropriate checks and balances are required to be put in place in time by all regulatory authorities concerned. Going by the international experience and specificity of the Indian system, the likely problem areas are being enumerated here:

- The problem of 'conflict of interest' would also arise in a different form; as banks are privy to a lot of information about the customer, especially in the context of know your customer (KYC) system being in place, these information could be used by the insurers for their unfair advantage.

- With more integration between and among various constituents of financial sector, there is greater possibility for 'contagion effect'.

- In India all insurance companies in private sector of recent origin and are in the process of stabilising, also highly aggressive due to

tough competition. The over ambitiousness should not smack their own limitation, especially in the case were insurance business is an internal organ of the universal banking system. Especially in a situation such as large scale natural calamities, *viz.*, Tsunami, earthquake, floods, *etc.*, would have a serious debilitating impact on the banking system, *via* insurance business. Therefore, the regulation and supervision needs to address the institution as a 'financial conglomerate' rather than each institution individually.

- The regulator of the insurance sector is of very recent origin unlike the banking sector regulatory authority, *viz.*, RBI. Although IRDA has done appreciable work within the short period, the regulation itself is a learning experience, any major migration of risk from insurance to banking would be more devastating if that was not handled appropriately at the right time.

- In the absence of a unified regulator or a single regulator, the possibility for 'regulatory arbitrage' could not be ruled out. Presently there is no statutory compulsion that the regulators should part with each other the sensitive information relating to their respective regulatory areas in order to read the signal, if any, which has systemic implications.

- Differences in the risk characteristics in banking and insurance will persist, relating, in particular, to the time pattern and degree of uncertainty in the cash flows and that has to be recognised and appropriately handled.

- The insurers' internal risk management and control systems for managing their asset market activities, and credit risk seems to be relatively less transparent unlike the banking system as also the prudential regulatory and supervisory system towards insurance is relatively recent one and less rigor as compared with the banking system, especially in the context of the banking system moving towards the Basel II framework.

- Conflicts of interest between different regulators also could not be ruled out.

- Ensuring transparency and disclosure on activity-wise may be difficult task for the regulators, *albeit* it is essential.
- Possibility of abuse of consumers by bankers from being coerced to buy insurance products against their will need to be guarded, which RBI has been already emphasising in its circular.
- Risk of 'double gearing' also possible as pointed out by Gentlay and Molyneux (1998).
- Possibility of banks using the long term insurance funds to meet their short term liquidity and the problem of asset - liability management also could not be ruled out.
- Recognising the value of sound risk management practices and hence also valuations on an aggregate portfolio basis - rather than individual instrument basis – would become essential to achieve alignment of underlying economic realities with financial statements, as the system is moving towards higher integration of varieties of activities including insurance.

Section V
Concluding Remarks

The success of bancassurance greatly hinges on banks ensuring excellent customers relationship, therefore banks need to strive towards that direction. As pointed out by Low (2004), the changing mindset is cascading through the banking sector in India and this would be a right time for banks to resorting to bancassurance, especially in the context of proactive policy environment of regulatory authorities and the Government. The fact that the banking operations in India, unlike in other developed countries, are still branch oriented and manually operated *vis-à-vis* highly mechanized and automated banking channels, *viz.*, internet banking, ATMs, *etc.* are all the more conducive for flourishing of bancassurance. Regulators could explore the possibility of allowing banks having tie-up arrangements with more than one insurance company, giving wider choice for the customers. In addition to acting as distributors, banks have recognised the potential of

bancassurance in India and will take equity stakes in insurance companies, in the long run. This is somewhat similar a trend observed in the United Kingdom and elsewhere where banks started off as distributors of insurance but then moved on to the fully owned insurance subsidiaries. Going by the present pace, bancassurance would turn out to be a norm rather than an exception in future in India. Supervisory concerns as pointed out earlier, could best be tackled by way of closer and systematized coordination between the respective supervisory authorities. There needs to be a clear cut identification of activities between banking and insurance at the institution's level as also at the level of regulators. Adequate training coupled with sufficient incentive system could avert the banks' staff resistance if any. In sum, bancassurance strategy would be a 'win-win situation' for all the parties involved - the customer, the insurance companies and the banks.

Notes

[1] Bharti Axa Life Insurance also commenced operation.

[2] According to IRDA Insurance broker means a person for the time-being licensed by the Authority under regulation 11, who for a remuneration arranges insurance contracts with insurance companies and/ or reinsurance companies on behalf of his clients. The insurance broker means either 'direct broker', a reinsurance broker or a, composite broker. An individual, firm, a company, a cooperative society or any other person authorized by the IRDA.

[3] Measured by the ratio of total insurance premium income by population.

[4] The process of increasing this upto 49% is still stated to be under active consideration of the Government.

References :

Business standard (2004): 'Bancassurance growth lifts Bajaj Allianz to No 3 spot' October 8, 2004.

Financial Express (2006): Bancassurance: Taking the Lead, January 1, 2006.

Government of India (1994) : Report of the Committee on Reforms in the Insurance sector (Malhotra Committee Report) New, Delhi.

Graham and Boyd (1988) : 'The Profitability and Risk Effects of allowing Bank Holding Companies to Merge with other Financial Firms: A Simulation Study', *Federal Reserve Bank of Minneapolis Quarterly Review,* Spring 3-20

Insurance Regulatory Development Authority, *Annual Report*, various volumes, New Delhi.

Karunagaran A (2005) **:** Towards Universal Banking in India - Some Regulatory and Supervisory Issues, *IBA Bulletin, Special Issue 2005*, January, Vol XXVII No 1.

Knight D Malcolm (2005) : Meeting worlds ? Insurance and Banking, *Speech***,** available at BIS website.

Krishnamurthy R (2003) : 'Blueprint for Success – Bringing bancassurance to India' *Irda Journal,* pp20-23 December 2003, IRDA, New Delhi.

Krishnapani Kesiraj (2003) Edtd : Bancassurance an introduction, ICFAI Press, Hyderabad.

Krueger O Anne (2004) : Banking Needs of Global Economy, Keynote Address, *IBA Bulletin, Special Issue 2005*, January, Vol XXVII No 1.

Low Chris (2004) : 'Changing mindset is cascading thru banking sector' *Business line* October 9, 2004

Malpani Sudarshan (2004) : **'**Many Roads to bancassurance**…'** *Irda Journal*, pp26-27. August 2004, IRDA, New Delhi.

Mathur S B (2003) : 'Strategies…' *Irda Journal*, pp29-30. December 2003, IRDA, New Delhi.

Benelay Nadege and Molyneux Philip (1998) : Bancassurance, Mac Millan Press Ltd., London

Olson W Mark (2004) : 'Regulatory update banking industry, insurance and securities activities'**,** Remarks at the Bank Insurance and Securities Association Legislative, Regulatory and Compliance Seminar, Washington DC, June 10, 2004. *Reproduced in BIS Review 36/2004*, Basle.

Ranade Ajit and Ahuja Rajeev (1999) : 'Life Insurance in India : Emerging Issues', Economic and political Weekly, January 16-22/ 23-29, Vol XXXIV, Nos 3 and 4. Mumbai

Rao G V (2003) : 'What Brokers Are ?', *Irda Journal*, March 2003, IRDA, New Delhi.

Reserve Bank of India website **:** *www.rbi.org.in* for banking related references.

Swiss Re (2002): Bancassurance Developments in Asia, Sigma No 7/ Switzerland.

Swiss Re (2004): World Insurance in 2003, Sigma No 3/ Switzerland.

Swiss Re (1992): Bancassurance : A Survey of competition between banking and insurance' Sigma No 2/ Swiss Re, Switzerland.

SCOR (2003) : Bancassurance across the globe – Meets with very mixed response' SCOR Technical Newsletter, February, France.

ANNEX I

RBI Guidelines for the Banks to enter into Insurance Business

Following the issuance of Government of India Notification dated August 3, 2000, specifying 'Insurance' as a permissible form of business that could be undertaken by banks under Section 6(1)(o) of the Banking Regulation Act, 1949, RBI issued the guidelines on Insurance business for banks.

1. Any scheduled commercial bank would be permitted to undertake insurance business as agent of insurance companies on fee basis, without any risk participation. The subsidiaries of banks will also be allowed to undertake distribution of insurance product on agency basis.

2. Banks which satisfy the eligibility criteria given below will be permitted to set up a joint venture company for undertaking insurance business with risk participation, subject to safeguards. The maximum equity contribution such a bank can hold in the joint venture company will normally be 50 per cent of the paid-up capital of the insurance company. On a selective basis the Reserve Bank of India may permit a higher equity contribution by a promoter bank initially, pending divestment of equity within the prescribed period (see Note 1 below).

   The eligibility criteria for joint venture participant are as under:

   i. The net worth of the bank should not be less than Rs.500 crore;

   ii. The CRAR of the bank should not be less than 10 per cent;

   iii. The level of non-performing assets should be reasonable;

   iv. The bank should have net profit for the last three consecutive years;

   v. The track record of the performance of the subsidiaries, if any, of the concerned bank should be satisfactory.

3. In cases where a foreign partner contributes 26 per cent of the equity with the approval of Insurance Regulatory and Development

Authority/Foreign Investment Promotion Board, more than one public sector bank or private sector bank may be allowed to participate in the equity of the insurance joint venture. As such participants will also assume insurance risk, only those banks which satisfy the criteria given in paragraph 2 above, would be eligible.

4. A subsidiary of a bank or of another bank will not normally be allowed to join the insurance company on risk participation basis. Subsidiaries would include bank subsidiaries undertaking merchant banking, securities, mutual fund, leasing finance, housing finance business, *etc.*

5. Banks which are not eligible for 'joint venture' participant as above, can make investments up to 10% of the net worth of the bank or Rs.50 crore, whichever is lower, in the insurance company for providing infrastructure and services support. Such participation shall be treated as an investment and should be without any contingent liability for the bank.

   The eligibility criteria for these banks will be as under :

   i. The CRAR of the bank should not be less than 10%;

   ii. The level of NPAs should be reasonable;

   iii. The bank should have net profit for the last three consecutive years.

6. All banks entering into insurance business will be required to obtain prior approval of the Reserve Bank. The Reserve Bank will give permission to banks on case to case basis keeping in view all relevant factors including the position in regard to the level of non-performing assets of the applicant bank so as to ensure that non-performing assets do not pose any future threat to the bank in its present or the proposed line of activity, *viz.*, insurance business. It should be ensured that risks involved in insurance business do not get transferred to the bank and that the banking business does not get contaminated by any risks which may arise from insurance business. There should be 'arms length' relationship between the bank and the insurance outfit.

Notes:

1. Holding of equity by a promoter bank in an insurance company or participation in any form in insurance business will be subject to compliance with any rules and regulations laid down by the IRDA/Central Government. This will include compliance with Section 6AA of the Insurance Act as amended by the IRDA Act, 1999, for divestment of equity in excess of 26 per cent of the paid up capital within a prescribed period of time.

2. Latest audited balance sheet will be considered for reckoning the eligibility criteria.

3. Banks which make investments under paragraph 5 of the above guidelines, and later qualify for risk participation in insurance business (as per paragraph 2 of the guidelines) will be eligible to apply to the Reserve Bank for permission to undertake insurance business on risk participation basis.

Insurance Agency Business/ Referral Arrangement

The banks (includes SCBs and DCCBs) need not obtain prior approval of the RBI for engaging in insurance agency business or referral arrangement without any risk participation, subject to the following conditions :

i. The bank should comply with the IRDA regulations for acting as 'composite corporate agent' or 'referral arrangement' with insurance companies.

ii. The bank should not adopt any restrictive practice of forcing its customers to go in only for a particular insurance company in respect of assets financed by the bank. The customers should be allowed to exercise their own choice.

iii. The bank desirous of entering into referral arrangement, besides complying with IRDA regulations, should also enter into an agreement with the insurance company concerned for allowing use of its premises and making use of the existing infrastructure of the bank. The agreement should be for a period not exceeding

three years at the first instance and the bank should have the discretion to renegotiate the terms depending on its satisfaction with the service or replace it by another agreement after the initial period. Thereafter, the bank will be free to sign a longer term contract with the approval of its Board in the case of a private sector bank and with the approval of Government of India in respect of a public sector bank.

iv. As the participation by a bank's customer in insurance products is purely on a voluntary basis, it should be stated in all publicity material distributed by the bank in a prominent way. There should be no 'linkage' either direct or indirect between the provision of banking services offered by the bank to its customers and use of the insurance products.

v. The risks, if any, involved in insurance agency/referral arrangement should not get transferred to the business of the bank.

Annex II

Life Insurance Companies in India as at the end-March 2005

Private Sector Companies

1. Bajaj Allianz Life Insurance Co. Ltd.
2. Birla Sun Life Insurance Co. Ltd.
3. HDFC Standard Life Insurance Co. Ltd.
4. ICICI Prudential Life Insurance Co. Ltd.
5. ING Vysya Life Insurance Co. Pvt. Ltd.
6. SBI Life Insurance Company Limited
7. TATA-AIG Life Insurance Company Ltd.
8. Sahara India Life Insurance Co. Ltd.#
9. Aviva Life Insurance Co India Pvt. Ltd.
10. Kotak Mahindra OU Mutual Life Insurance Co. Ltd.
11. Max New York Life Insurance Co. Ltd.
12. Metlife India Insurance Co. Pvt. Ltd.
13. Reliance Life Insurance Co. Ltd.
14. Shriram Life Insurance Co. Ltd.
15. Bharti Axa Life Insurance Co. Ltd.

Public Sector Company

16. Life Insurance Corporation of India

: The only private sector insurance Co without a foreign collaboration.

Non Life Insurance Companies in India as at the end-March 2005

Private Sector Companies

1. Royal Sundaram Allianz Insurance Co. Ltd.
2. TATA-AIG General Insurance Co. Ltd.

3. Reliance General Insurance Co. Ltd.
4. IFFCO-TOKIO General Insurance Co. Ltd.
5. ICICI Lombard General Insurance Co. Ltd.
6. Bajaj Allianz General Insurance Co. Ltd.
7. HDFC Chubb General Insurance Co. Ltd.
8. Cholamandalam MS General Insurance Co. Ltd.
9. Star Health and Alhed Insurance Co. Ltd.

Public Sector Companies

10. The New India Assurance Co. Ltd.
11. National Insurance Co. Ltd.
12. United India Insurance Co. Ltd.
13. The Oriental Insurance Co. Ltd.
14. Export Credit Guarantee Corporation Ltd.
15. Agriculture Insurance Company Ltd.

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Globalisation and Opening Markets in Developing Countries and Impact on National Firms and Public Governance: The Case of India by Jean-Francois Huchet & Joel Ruet, Scientific Coordinators, Report by CSH, CERNA, LSE, ORF NCAER, New Delhi, 2006, Pages 389.

World over, globalisation has the fundamental effect on economic development. India is no exception to this global phenomenon. Developing countries can no longer so easily play the protectionist card and assure their development in the globalised regime. However, in the light of the Asian experience as well as the experience of developed countries, one could raise certain crucial questions about the impact of the globalisation on developing countries such as opening-up of internal market and the effects of imports and FDI; State intervention to help SMEs in the competitive environment; changing behaviour of firms and improvement in corporate governance; vulnerability of domestic firms in the face of well-organised multilateral corporations; chances of technological spill over and technological breakthrough in the future; chances of local firms to grow into world-class companies within the current framework; Indian State and the current transformation of capitalism, *etc*. Much research needs to be done on these issues.

The captioned book attempts to analyse these issues and throw some light on the theoretical background of the impact of globalisation in its introductory part with a comparative analysis of India and China. The author observes that China and India have just changed their orbit of growth and their economies have started catching-up with the rest of the world. The reform of corporate governance is facing different challenges in India as compared to China. Further, India and China seem to have followed different strategies with different implications concerning technology emancipation. Increasing inequality across States calls for improvement in investment climate through measures ranging across infrastructure development, control of corruption, improvement in the law and order situation, development of banking and insurance, reform in labour laws, exit policy, investment in innovations and

technology, improved linkage with producers, strengthening education and skill formation.

The second part of the book contains seminar papers[1] including sector-specific studies authored by core members of the team. Among them, the first paper on 'Evolution of Indian Industry in the Post-Liberalisation Era' is an interesting one, which deals with the whole gamut of GDP growth trends, performance of manufacturing sector, change in structure of manufacturing production, employment situation and spatial distribution of manufacturing. The paper highlights the performance of Indian economy over the years and particularly in the last two decades, which suggests that the economy is on a different growth path than the one followed by the industrialised countries during their historical growth process. A question that still needs to be explored further is that whether this process is sustainable. According to the author, growth of the manufacturing sector in India has not shown any structural break during the 1980s. The author's findings and the growing literature on evaluation of performance of Indian industry suggest that infrastructure is a major bottleneck. However, there is indication that Indian manufacturing sector is trying to restructure itself in order to be better able to compete in the new liberalised trade regime. This has also resulted in hitherto import-substituting sectors to look at exports as a source of growth.

Jobless growth is the problem associated with the growth process of 1990s. But an interesting feature is that not only the rate of rise in workforce has been higher at higher education levels but their earnings have also increased at a faster pace. The preference for educated workers is increasing in manufacturing sector. More importantly, the shift in occupational pattern is towards the services sector as opposed to the manufacturing sector. This is in tune with the services sector providing the main impetus to growth in the 1990s. For the first time in the 1990s, there is a decline in the absolute number

[1] Paper presented in two Workshops held at Delhi on "Impact of Globalisation on National Firms: The Case of India and China in a Comparative Perspective" on April 18 & 19, 2005 and December 12 & 13, 2005.

of workers in agriculture but this has been largely due to a shift towards the wholesale and retail trade sector. The author highlights that there has been increasing inequality across States in terms of both state domestic per capita income and manufacturing value added per capita.

While turning to the next paper on "China and India: Trade Specialisation and Technological Catch-up", the author concludes that India and China have followed two different paths of integration into the world economy. Interestingly, their rise in international trade has not put them in direct competition. Both the countries display strong price competitiveness in high-tech exports. China has had much better export performance at the cost of a marked dependence on foreign technology and capital. India has a strong position in the world market of the most dynamic category of business services.

Next paper on "Firm-level Strategic Implications of Oil and Gas Reforms in India" clearly brings out the roles of the State, the private sector and the technology in the development of oil and gas in India. State continues to play an active role in the Indian energy sector, with the focus of energy policy being on the energy security of the country. Policy changes are gradually being introduced to enhance energy supply through raising domestic production as well as through overseas acquisitions. The oil and gas firms are going through a transition phase - from complete State control towards deregulation. As a result, private participation and collaborations between foreign and domestic firms are catching up in this sector. While private investment has been forthcoming in this sector, however, absence of guaranteed returns is proving to be a major bottleneck in the process. The author views that future studies should look at the in-depth nature of these collaborations - whether the firms are investing in longer term technological options or focusing on short-term technology leases. Given the crucial role of energy in the economic growth of the country, efficient policies are required to address all concerns.

"Indian and Chinese Electricity Industries; Reforms, National Champions and Private Industrial Dynamics" is the next paper in the

series in this second part of the book, which brings out the regional electricity politics, regulation and the market structure. Regulatory issues *per se* have often been either absent, or mere pretext, and China and India have much more faced a political economy of transformation than of optimisation. In this regard, industrially emerging countries have to take into account the following three aspects, *viz.*, long term planning, security for private investors and non-volatility. It is more difficult to assess the power sector, their strategies of opting-out of joint ventures and strategic reinvestment, which are seen in various manufacturing sectors. A form of 'Swadeshi' may exist in India, whereas this factor is tentatively less in China.

The next paper on "The Textile and Garment Industry in India" brings out competitiveness of the Indian industries, technology adaptation, business strategy in the globalisation era and the strategy for future growth. It is observed by the author that the Government has initiated some reforms in the recent years, although there are many steps left to unshackle the industry. The technological advancement in the textile and the garment sector has so far not been widespread. The author argues that with late entry in the global market, India will face entrenched incumbents with whom it will have to fight. Indeed, as China and South Asia climbs the technological ladder, the position occupied by India due to distortions in the domestic regime will be under severe threat both at export market and at home. Interestingly, the trajectory of this industry is not yet decided even though few observers doubt that the economic policies of successive Governments have been to integrate the Indian economy closer to the global economy externally and to liberalise the economy internally.

The paper on "The Chinese and Indian Automobile Industry in Perspective: Technology Appropriation, Catching-up and Development" compares critically the automobile industries in India with China and concludes that the car industry in both the countries are at the cross-road. The author put forth his argument with the fact that both the countries have transformed the car industry with similar as well as different tools and are facing the world competition. Constrained by State regulation, they have experienced opening-up

strategies, in the early 1980s in China and in the early 1990s in India. China has supported the development of this sector through bureaucratic means and market mechanisms. As a result, the sector till recently was weak and fragmented with the existence of more than 120 car makers over the country. The national system of innovation in China is weaker than in India. The predictable issue will be the specialisation of China in producing low added-value parts for exporting to the world market. Mass export will be more difficult before Chinese companies build up a strong competitive advantage. India seems to have accumulated more advantages in its cooperation with Western companies following the opening-up. The national system of innovation is meagerly developed than in China, with strong relations between constituents. This has fostered the transfer of technology and adaptation to the market environment in the Indian case.

"Asset Specificity, Partnerships and Global Strategies of Information Technology and Biotechnology Firms in India" is the next paper. This paper evaluates the Indian IT sector, biotechnology (BT) sector, their asset specificity, partnership, global strategies and the Indian experience thereon. The structural differences between an output-driven IT sector and a technologically organised BT sector are very real. This translates into a far greater physical specificity of assets in the BT sector. This combined with relatively higher site specificity and larger material investments in the BT sector impede its globalisation. It is true that the IT sector in India has a lead over the BT sector, but the latter is also faced with a stronger compulsion to tie-up first with more local firms than the IT sector. In respect of globalisation of the BT sector, the author argues that it is structurally less easy, a prediction confirmed by the ground reality. However, it is surprising to see that the scientific interactions built by Indian BT companies are largely local and very rarely global.

The paper on "Ownership Pattern of the Indian Corporate Sector: Implications for Corporate Governance" basically looks upon the evolution of corporate governance code in India. In the present ownership pattern, India has allowed the promoters to retain control over companies and there is hardly any threat to incumbent managements of vast majority of companies. In most companies

institutional investors have either no presence or are only marginal players. There is also the possibility that the liberalised Companies Act encourages inter-corporate investments, which reduce the risk borne by the promoters while increasing their holding. Private managements probably did not oppose the induction of independent directors initially because first, it was difficult for them to openly oppose the international trend and secondly, they had the freedom to decide on a director's independence. If the objective of the corporate governance is to have genuine independent directors and constraining the promoters, placing restrictions on promoter voting and making cumulative voting and representation of minority shareholders mandatory need a fresh look. The author opined to make provisions relating to election of directors more restrictive so that diverse shareholder interests could get representation on corporate boards.

"State Intervention in Labour Legislation and Employment Repercussions: Empirical Evidence" is the last paper in this series, which argued that the role of the State needs to be minimised and unless the rigidity in labour markets is removed, higher growth will not necessarily translate into greater employment in the current economic setting. The author observes that the employment growth in manufacturing sector has been negative, with its capital intensity rising over the last two decades. The empirical results support the theoretical analysis that there has been a substitution of labour by capital since the mid-eighties as the employers, in reaction to the rigid labour clause, have adopted artificially high capital intensity. Further, the philosophy of the Industrial Disputes Act (IDA) is seriously questioned today. Chapter V-B in specific and the IDA in general, discourage technological upgradation through its protective stand towards labour. This has led to less job creation, as the protective labour laws are not beneficial for labour. Further, delays in dispute settlement add to the woes of the labour force, and calls for a rethinking on the very working of the act. In the current economic setting, the role of the State needs to be minimised and unless the rigidity in labour markets is removed, higher growth will not necessarily translate into greater employment. The current statute makes it impossible for companies to exit and competition cannot

function without free exit. The author, therefore, concludes that the IDA needs a thorough revision.

The third part of the book elaborates the survey results of the industrial case studies conducted on the basis of well designed questionnaire circulated to 16 leading corporate houses representing different segment of the industry, including group companies like Tata Group, Hinduja Group, *etc*. The questionnaire mainly concentrated on the role of the State, relation between State and enterprises, industrial and technological policy, technological upgradation, cooperation with foreign firms, evolution of corporate governance and comparative perspective of India and China. In addition, information were gathered from some firms through direct interview with the executives.

The present book, in toto, is a compendium of papers concentrating various aspects of globalisation and industrial development in India with the comparison of China, which gives some insight on the reality of the Indian as well as Chinese industries and suggest some perspective plan to improve the Indian industry. While the conclusions of some of the papers are debatable, yet the book provides direction for further research. This is a welcome and useful effort towards the current burning issue of effects of globalisation and the developing countries. However, this book could have undertaken a deeper analysis on various parameters of competitiveness of the Indian industries *vis-à-vis* China, which otherwise would have provided more detailed comparison along with short-comings in the globalised regime. Further, the book has not brought out any concrete conclusion on the overall assessment of the firms that the book has conducted case study. As a whole, this book may be a very useful reference book to pursue further research in this area.

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"The Economics of Information Technology: An Introduction" by Hal R. Varian, Joseph Farrell, Carl Shapiro, Cambridge University Press, Cambridge, 2004, pages 102, Price Rs. 795

This book provides probably an ideal introduction on economic factors affecting information technology industries. It is concise and is organised into two main sections. The first section of the book outlines the economics of Information Technology (IT) industries. This section asserts that better information for existing industries in the IT sector and demand and supply-side economies of scale lead to concentration in the high-technology industries. The second section is very relevant for countries like India where the IT sector is rapidly developing. This section analyses the role of Intellectual Property Rights (IPR) in information technology industries. It discusses whether the existing IPR regime function is intended to stimulate innovation and thus promote long-run competition or whether the system is out of balance, granting excessive IPR rights and could be improved so as to avoid retarding of innovation. The study briefly mentions about some of the important economic factors affecting IT industries like high fixed costs and low marginal costs of production, large switching costs for users and strong network effects. Considering the revolution which the development of IT brought in the world of communication and commerce, it is not wrong if one point out, internet as one of the greatest invention in recent times and there is a need for new economics to understand how this revolution will change economic laws.

The introduction of the book correctly assesses that during the 1990s there were three events that stimulated IT: *viz.*, (i) telecommunications deregulation in 1996, (ii) the 'year 2000 problem' (Y2K problem) in 1998-99 and (iii) the 'dot com' boom in 1999-2000. In this context it may be mentioned that, the 'Y2K problem' is the "single phenomenon" that launched India as a serious player in the international software scenario. The huge demand for software engineers and programmers from India to fix the Y2K glitches gave a good starting point for the IT sector in India and marked the beginning of the outsourcing era in India.

The authors connote internet boom as a "combinatorial innovation". This means that innovation can be combined and recombined to create new products. They point out that the lack of physical constraints has facilitated the rapid progress in internet revolution. The internet revolution may not be a major invention compared to the technological developments of the past but the uniqueness of this revolution lay in the fact that it involved immaterial components like programmes and there were no delays in manufacturing or shipping. Innovators everywhere could combine and recombine this software to create a host of new applications.

The study point out that price discrimination is important in high-tech industries for two reasons: First, the high-fixed-cost and low-marginal-cost technologies observed in these industries often lead to significant market power. Second, IT enables for fine observation and analysis of consumer behavior allowing various marketing strategies that were earlier difficult to carry out.

The book under review discusses privacy issues and points out that these issues are of trust, *i.e.,* consumers want to control how information about them is used. Seller of IT goods can offer prices and goods that are differentiated by individual behavior or characteristics. Under first-degree price discrimination, firms will charge the highest price they can to each consumer, thereby capturing all the consumer surplus. Second-degree price discrimination refers to a situation where everyone faces the same menu of prices for a set of related products. It is also known as "product line pricing", "market segmentation" or "versioning" and is widely seen in the market. For example, newspapers are available online and in physical form. Similarly, movies are available in theatres, on tape, on DVD, and on TV. In short, information goods can be sold in different versions. Versioning is good in that it allows markets to be served that would otherwise not be served. This is the standard output-enhancing effect of price discrimination.

Third-degree price discrimination is selling at different prices to different groups. Armstrong and Vickers (2001) observe that when consumers have the same tastes and there is a fixed cost of servicing

each consumer, then competitive third-degree price discrimination will make consumers better off. The reason is that competition forces firms to maximise consumer utility. Another form of price discrimination in high-tech markets is price discrimination based on purchase history. Fudenberg and Tirole (1998) investigate models where a monopolist can discriminate between old and new customers by offering upgrades, enhancements and the like.

The study discusses, bundling, which is, the practice of selling two or more distinct goods together (Adams and Yellen, 1976). This is particularly attractive for information goods since the marginal cost of adding an extra good to a bundle is negligible. In this case according to the book, there are two distinct economic effects: reduced dispersion of willingness to pay, which is a form of price discrimination, and increased barriers to entry. Bakos and Brynjolfsson (1999, 2000, 2001) have shown that bundling significantly enhances firm profit and overall efficiency, but at the cost of a reduction in consumer surplus.

The book rightly points out that the welfare theorem assumes that competition benefits consumers, if the variables for the firms are prices, innovation and quality choice. However, firms may also compete on other dimensions that may reduce welfare such as political lobbying, *etc*. This book indicates that the choice of dimensions in which to compete has not received sufficient attention in existing literature and this is an area for future research.

The study describe three forms of competition in standard setting, *viz.*, (i) standards war (in which tactics such as penetration pricing to build an early lead, etc are adopted), (ii) standards negotiations (here each prefers its own standard to the other's) and (iii) standards leader (in which a leading firm wants to maintain a standard but a group of small firms wants to interconnect with the standard). Standardisation reduces the cost due to economies of scale in manufacture and reduces the risk associated with supplying idiosyncratic parts.

Part two of the book complements its first part by focusing on IPR. IPR play a major role in creating competitive advantage in the

information economy than what it did in the agriculture and industry. This section provides an overview of the IPR regime in the USA. The study mentions that currently the debate is active on whether copyright law must change. On the one hand, certain copyright holders express concern that modern IT is permitting piracy to become rampant, and the internet is serving as "one giant copying machine". On the other hand, critics of copyrights assert that copyrights confer too much power, either to control how works are used or to keep works out of the public domain for many years.

The book discusses two schools of thought on incentives for innovation which is very interesting, *i.e.*, the 'incentive school' and 'openness school'. The incentive school focuses on whether an innovator can capture a large portion of the benefit of his or her creation. This school thinks of innovation that is "1% inspiration, 99% perspiration". Perspiration will be more forthcoming if it is well paid. The openness school, by contrast, feels that there are incentives for innovation-often stronger than intellectual property like social recognition, career advancement, *etc.*

Patents, a reward for successful innovation, confer exclusive rights leading to monopoly. Since the costs are substantial, the policy of granting patents only makes economic sense in cases where it is sufficiently likely that chances of innovation would be substantially reduced or delayed in the absence of a patent. This insight is reflected in the legal requirements that the invention be "novel" and "non-obvious". Despite many studies on this topic there are no quick answers to this question of incentives to inventors. In this context, it is very interesting to note that, IBM pledged 500 of its existing software patents to the open-source community, to be placed into a patent "commons" that allows open-source software developers to use the innovations and build upon them without risk of infringement. One of the reasons for this unusual step is the fear that they risk undermining innovation. The patent commons is meant to help restore the balance. Many companies such as Nokia have taken similar initiatives (*The Economist*, October 22, 2005). The book under review, however, does not mention much about this very novel and important trend of 'open-source'.

The patent holders can issue licenses permitting others to use their inventions. Patent holders can earn more profits by licensing their patents than by withholding it. From the welfare angle, licensing allows diffusion of new technologies. The book point out a pertinent point that unlike stronger patent protection, which at best can promote innovation at the expense of diffusion, licensing can simultaneously promote both innovation and diffusion. Cross licenses are used for utilising patents of each others' invention.

The study mentions about the distinction between trade secrets and patents. Trade secrets are information that individuals or companies possess but do not share. However, unlike copyrights and patents, trade secrets lose protection once they are out in public domain. Trade secret protection is weak in that the owner of the trade secret cannot prevent others from using the same know-how if they discover it independently. Therefore, the decision for keeping the new technology secret or file for a patent is very critical. The *quid pro quo* for obtaining a patent is the disclosure of the invention to the public, making it more likely that other firms will attempt to use the patented invention or even build on it to obtain their own patents. However, the patent is hard to enforce and will last for only 20 years. On the other hand, trade secrets can be kept indefinitely. The study points out that many experts are calling for reform to the US patent system. The major problem identified is that of patent quality: too many "questionable" patents are issued by the Patent and Trademark Office (PTO). One reason cited for this is that the existing means of challenging issued or prospective patents are inadequate.

The study conclude that intellectual property- copyrights, patents and trade secrets-will play an important role in the 21st century and IT will comprise a greater proportion of economic activity. The authors make a very valid observation that copyright law and patent law are under pressure to evolve as IT advances very rapidly. The fight between those who benefit from the current system, with its careless standards for the issuance of patents and those who bear the costs of those patents, also is increasing. The book predict that in the near future the US patent system will be reformed to reduce the number of "questionable" patents.

The book is very relevant in this age of IT and inventions. It is very focused and informative. The authors cite many other important works in this area which enable the readers to get a wider picture and diversified view of this topic. It may be recalled that, many economists have pointed out that nowadays disparities in the productivity and growth of different countries have far less to do with their abundance (or lack) of natural resources than with the capacity to improve the quality of human capital (knowledge). The information and communication technology revolution is crucial as it involves technologies meant for the production and dissemination of knowledge. Ideas are to the information age what the physical environment was to the industrial one. Just as pollution or an irresponsible use of property rights threatens land and climate, so also a too tight intellectual-property inhibits invention. IPR greatly influence the switching costs. This study correctly points out that finding the right balance will test the industry, policymakers and the public in coming years. It is also true that as the developing countries like China, and India increase the patents in their name; the developed countries may start to see the present IPR system from a different perspective. The book under review is very topical and relevant for India in the context of its rising IT sector. Developing countries should take all precautions to make its patent rules and IT laws well balanced and compatible to the overall development of these countries. The numerous examples on the unique characteristics of the IT industries add the merit of this study. In short, this book will be an asset for all those who are interested in a study of IT, IPR and related area.

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