

AN EMPIRICAL ANALYSIS OF PRO-CYCLICALITY OF BANK CREDIT IN INDIA: ROLE OF BASEL PRUDENTIAL NORMS[#]

Amaresh Samantaraya^{*}

It is widely observed that the growth of bank credit accelerates during the periods of boom, while it decelerates during the periods of economic slowdown/depression, thus exhibiting some tendency of pro-cyclicality. Basel prudential norms in terms of regulatory capital prescriptions and loan loss provisioning are widely considered as exacerbating the pro-cyclicality of bank credit. The present study attempted to empirically examine the pro-cyclicality behaviour of bank credit in India, particularly exploring various contributory factors for drawing important implications for monetary policy. Analysis of behavior of aggregate bank credit since 1950s revealed presence of pro-cyclicality, which has become pronounced since late 1990s. Reform initiatives providing considerable operational autonomy to banks in business decisions moving away from administered regime along with adoption of Basel prudential norms could have reinforced pro-cyclicality in bank credit in India in last decade or so. Examining the role of various contributory factors based on bank-wise panel data, it is observed that indeed capital requirements and loan loss provisions have magnified pro-cyclicality of bank credit. From policy perspective, considering prudential policies pursuing banking soundness vis-à-vis monetary policy objective of price stability, as also drawing from the lessons on regulatory and supervisory aspects from the ongoing global financial turbulence, the issue of coordination needs to be placed on top of the agenda.

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Key words : Bank credit, pro-cyclicality, Basel prudential norms, panel data

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^{*} Dr. Amaresh Samantaraya is Assistant Adviser in the Department of Economic Analysis and Policy, Reserve Bank of India. Views expressed in the paper are personal and do not necessarily reflect those of the employer. The author is thankful to Prof. B. Kamaiah, Prof. K. Krishnamurthy, Dr. Himansu Joshi, Shri Indranil Bhattacharya and Shri N.S Rawat for helpful comments on an earlier draft of the paper. Usual disclaimers apply.

I. INTRODUCTION

Business cycles, widely discussed in the macroeconomic literature, involves periodic reoccurrences of booms and busts of economic activity representing the simplest example of cyclicity in economics. It is widely observed that the growth of bank credit accelerates during the periods of boom, while it decelerates during the periods of economic slowdown/depression, thus exhibiting some tendency of pro-cyclicality. The pro-cyclicality of bank credit can be explained by various factors. Fundamentally, from the supply side, variation in the perception of credit risk across different phases of the business cycle and thus, altering the creditworthiness of the borrower is a major source of credit pro-cyclicality. In the economic boom, prevailing business optimism manifests in the banker assigning higher credit scores for a borrower and thus, boosting up the willingness to lend. On the contrary, during economic downturn pessimistic outlook raises suspicion regarding the viability of projects with increasing tendency to hold back lending decisions. From the demand side, inherent optimism/pessimism in the economic activity associated with business cycle, augments/restrains consumption and investment spendings with consequent influence on demand for bank credit.

In the recent years, noted contributions by Berger and Udell (1994), Blum and Hellwig (1995), Furfine (2000), Borio, Furfine and Lowe (2001), Fernandez, Pages and Saurina (2002), Berger and Udell (2003), and Bikker and Metzmakers (2004) have highlighted issues related to the adoption of Basel prudential norms in terms of regulatory capital prescriptions and loan loss provisioning reinforcing the pro-cyclicality of bank credit. In the economic downturn, increasing risk perception entails requirement of higher regulatory capital maintenance. The problem is exacerbated in the face of higher cost of raising capital during this adverse scenario. If lending is capital constrained, this may precipitate in tightening lending conditions. ‘Capital crunch’ – characterising simultaneous shortage of capital and tight lending conditions – results in the reduction of bank assets or alternately drives a shift towards less

risky assets, such as government securities. The other factor which bolsters the pro-cyclicality of bank lending is the provisioning for expected loan losses. During economic downturn, as the economic conditions deteriorate, the likelihood of earning assets becoming non-performing assets increases, requiring additional provisioning and write-offs. This, in turn, correspondingly curtails bank's ability to extend loans. Conversely, when the economy is strong, the probability of loan losses plummets, and less provisioning requirements frees up resources for lending.

In the above backdrop, explicit account of influence of regulatory capital and loan loss provisioning on bank credit would facilitate better understanding of fluctuation of bank credit during economic boom and downturn. More importantly, the issue of regulatory capital and reserve requirement reinforcing pro-cyclicality of bank credit has considerable significance for the central banks due to its implications for monetary policy. With simple arithmetic examples, Bliss and Kaufmann (2002) have demonstrated the weakening effectiveness of monetary policy as the regulatory capital and reserve requirements control bank the lending behaviour.

In the Indian context, a handful of empirical studies have attempted to examine the impact of capital requirements and loan loss provisioning on bank credit, particularly in the post-reform period when Basel prudential norms were introduced (Appendix Table 1). Nachane, Narain, Ghosh and Sahoo (2000) supported capital as a useful instrument for influencing bank behaviour and did not find conclusive evidence to support a shift from high-risk towards low-risk asset category by banks. Nag and Das (2002) attempted to empirically verify the role of capital standards in aggravating credit crunch. They found that banks shifted their portfolio in a way that reduce their capital requirements and the stricter risk management practices interplayed with minimum regulatory capital requirements having a dampening effect on the overall credit supply. Ghosh, Nachane, Narain and Sahoo (2003) examined the degree of influence of capital requirements on the bank behavior and found that banks responded

to capital requirements by boosting their own capital rather than through systematic substitution away from high-risk loans. They concluded that “the Indian evidence shows up capital requirements as an attractive regulatory instrument since they serve to reinforce the stability of the banking system without apparently distorting the lending choices of banks”. Contrary to Nag and Das (2002), findings of Ghosh *et al* (2003) apparently implied absence of strong pro-cyclicality in bank credit. Ghosh and Nachane (2003) found a positive association between ratio of loan loss provisions and bank earnings, suggesting existence of income-smoothing; while the negative association between loan growth and loan loss provisioning indicated lack of considerations of real business cycle effects on credit quality. Their analysis corroborated the fact that during cyclical downswings, banks dig into their capital base to make provisions for loan losses reinforcing credit pro-cyclicality.

Among the studies discussed above in the Indian context, only Ghosh and Nachane (2003) attempted to analyse the influence of loan loss provisions on the pro-cyclicality of bank credit explicitly, while the implications for the pro-cyclicality behavior can be derived indirectly from the empirical findings of others. It is also clear that there is no consensus about the role of capital requirements and loan loss provisions reinforcing pro-cyclicality of bank credit in India. Moreover, these studies confined only to public sector banks for their empirical analysis and covered very short period mostly representing relative economic and credit slowdown.

In this backdrop, the present study attempted to re-examine pro-cyclicality behaviour of bank credit in India, particularly exploring various contributory factors with the objective of drawing important implications for monetary policy. It improves upon the previous studies, mainly on three accounts. First, while the previous studies confined to a particular aspect of Basel prudential norm such as capital requirement or loan loss provisioning, the present study examined an entire set of factors influencing demand for and supply of bank

credit, simultaneously. Second, the sample of banks was enlarged to include leading private sector and foreign banks. When a private sector bank is at present the second largest commercial bank in the country, it is imperative not to ignore this segment. Moreover, the sample including heterogeneous bank groups will also strengthen robustness of the estimated results. Third, the period of coverage for the present study is 1995-96 to 2007-08, which covers period of both rapid expansion and slowdown in economic activity¹. It is worth mentioning that the business cycle seems to have been relatively pronounced during the period considered, which might render this an interesting case study. We have developed a model derived from the supply of and demand for bank credit and employed panel data analysis for examining various contributory factors causing pro-cyclicality of bank credit in India.

The study organized as below. Section II briefly highlights the long-run relationship between economic growth and bank credit in India at aggregate level and traces prominence in the pro-cyclicality behavior since late 1990s. Section III develops the model for our empirical analysis based on bank-wise panel data and covers data issues. Empirical results from panel data analysis are provided in Section IV, and Section V concludes with policy implications.

II. PRO-CYCLICALITY OF BANK CREDIT IN INDIA: PRELIMINARY EVIDENCES

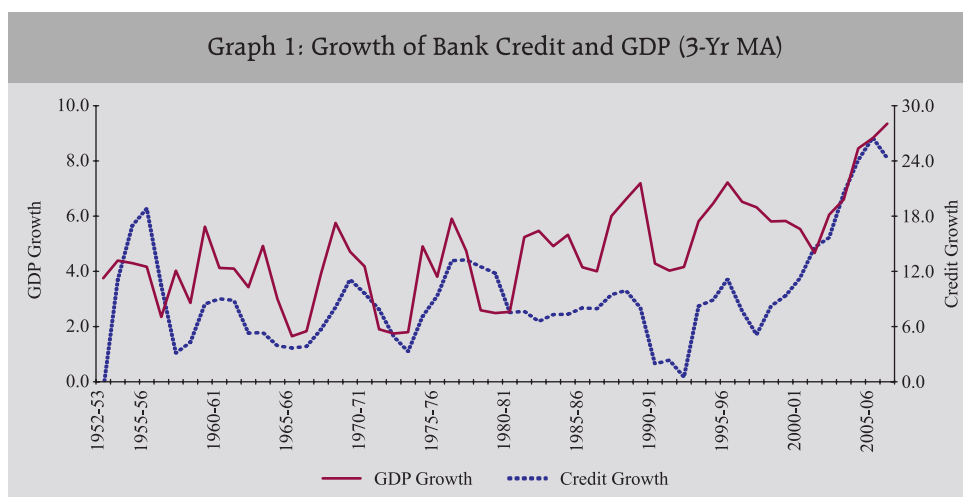
In this section, an attempt has been made to examine the association between real economic growth (GDP) and aggregate bank credit (in terms of non-food credit) in India since the 1950s. In the entire study, bank credit is used in real terms adjusted by implicit GDP deflator. During the first three decades since Independence (1951-52 to 1979-80), the average growth was lower at around 3.5 per cent. During this period, average growth rate of credit

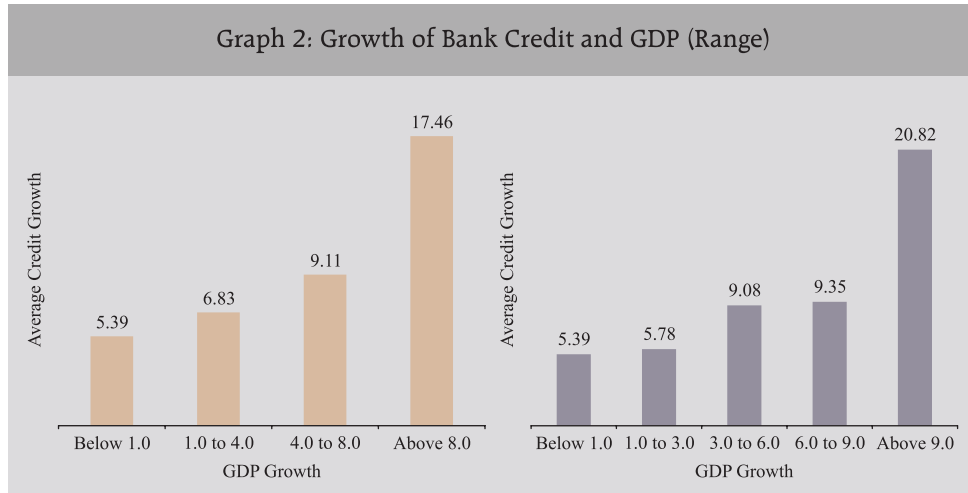
¹ The average economic growth slowed down from an average of 7.6 per cent during 1995-97 to 5.2 per cent during 1997-2002. Subsequently, it heightened to 8.8 per cent during 2003-08.

was around 7.8 per cent. Average economic growth moved up to 5.6 per cent in the decade of 1980s (1980-81 to 1989-90), which also witnessed average growth of bank credit accentuating to 8.2 per cent. During the post-reform period (since 1992-93) the average economic growth further increased to 6.8 per cent. During this period, average growth of bank credit moved up to 13.8 per cent, correspondingly. Particularly, with economic growth leaping to the higher growth trajectory of 8.8 per cent during 2003-08, credit growth also concomitantly soared to 22.4 per cent during the comparable period. The correlation coefficient between GDP and bank credit during the period turns out to be 0.94 (statistically significant with p-value = 0.00).

Graph 1 below, depicts 3-year moving average of growth rates of GDP and bank credit. It can be observed from Graph 1 that largely high/low growth in bank credit is associated with corresponding high/low economic growth.

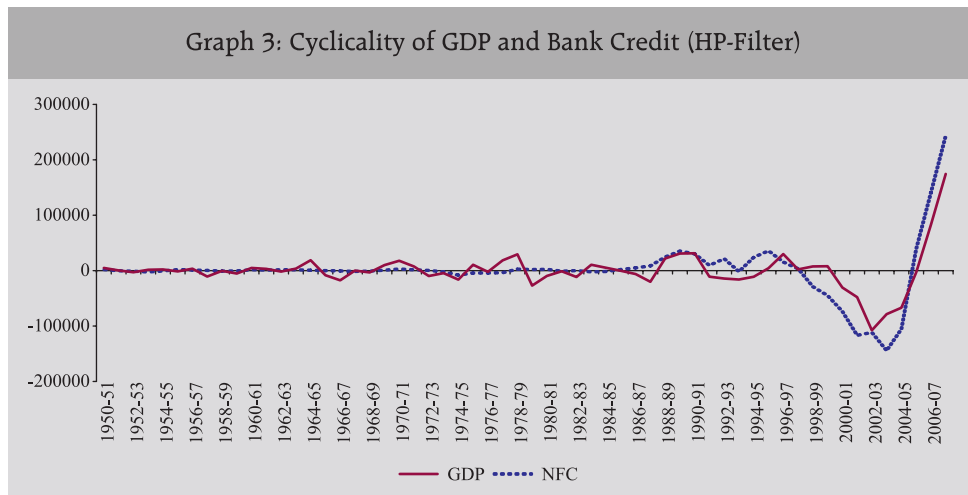
In Graph 2, the average growth rate of bank credit against different range of economic growth is plotted. Both left and right panels broadly exhibit that for higher economic growth rates, the average growth rate of bank credit is high, while for lower economic growth rates, the average growth rate of bank credit is low.





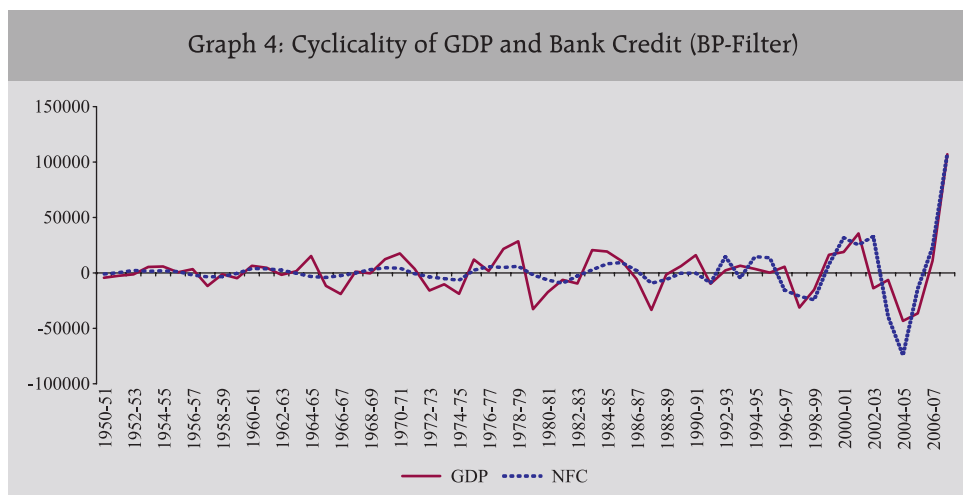
As formal tools of pro-cyclicality, Graphs 3 and 4 depict cyclical behaviour of GDP and bank credit (NFC) by applying Hodrick-Prescott (HP)-filter and Band-Pass (BP) filter, respectively. Christiano-Fitzgerald full length asymmetric filter was used as the BP-filter.

From Graph 3, prior to mid-1980s, cyclical movement in bank credit could not be traced. Since mid-1980s, upward/downward swings in bank credit are clearly observed to be associated with similar movements in GDP. Moreover,



the cyclical movements in both the series became more prominent in last decade or so. The BP-filter captures mild cyclical movements in bank credit even prior to mid-1980s (Graph 4). Similar to the HP-filter, the BP-filter also captures the amplitudes of the cycle magnifying since late 1990s.

One possible explanation for prominence of credit pro-cyclicality since late 1990s could be due to the fact that banks gained considerable freedom in business decisions moving away from the administered regime of the past. Reform initiatives towards greater market orientation in the banking system in India found fuller expression in the second half of the 1990s. These initiatives include freedom to determine lending rates for credit limit of over Rs. 2 lakh since October 1994 and term deposit rates of maturity over 1 year since July 1996. With a view to promote the interest rate channel of monetary transmission, the Reserve Bank of India reactivated the 'Bank Rate' since April 1997, by linking it to various refinance rates. The SLR and CRR were reduced in a phased manner to rationalise statutory pre-emption of resources of the banks. The SLR was reduced to the then statutory minimum of 25 per cent by October 1997 and the CRR witnessed gradual downward revision with a medium term objective of reducing it to the statutory minimum. In the government securities



market, primary dealers (PDs) became operational since 1996 activating secondary market trading, liquidity and turnover. All these could have facilitated considerable operational autonomy in the banking sector guiding lending decisions on commercial basis, and thus, showing up expected pro-cyclicality *vis-à-vis* economic activity.

Could introduction of Basel prudential norms such as capital adequacy and provisioning requirements be a contributory factor for this phenomenon? To examine this, an econometric exercise is attempted in Section IV.

Thus, the analysis of behaviour of aggregate bank credit in India in this Section established its close association with economic activity. It was also observed that the pro-cyclicality of bank credit became quite prominent in the last decade or so. Perhaps, adoption of Basel prudential norms could have reinforced the pro-cyclicality. Another related issue is aggregate data suppresses idiosyncrasy across banks and may be a few big banks could have dominated aggregate behaviour. To address the above issues, bank-wise credit behaviour based on a model derived from demand for and supply of bank credit is examined as below.

III. ECONOMETRIC MODEL AND DATA ISSUES

III.A. Econometric Model

In this section, the theoretical model for our econometric analysis derived from the functions of demand for and supply of bankwise credit will be developed. This will be used to examine the role of various factors causing pro-cyclical behaviour of bank credit in India.

Supply of bank credit by an individual bank (L_{it}) is influenced mainly by three sets of factors. Sources of funding are the principal factors contributing to credit flow. Mainly there are three sources of funding namely, (i) deposits (D), (ii) market funding and (iii) equity. Consolidated balance sheet of Scheduled Commercial Banks in India reveals that deposits constitute close to

80 per cent of total liabilities, while capital contributes to around one per cent of total liabilities. As the source of funding for influencing bank credit flow, we shall limit to the dominant source of the deposits. Deposits are expected to have positive influence on the bank credit.

Second set of factors influencing supply of bank credit are related to key macroeconomic variables. The list may include bank lending rate '*l*' depicting the earning prospects, weighted average yield on government securities '*g*' representing the opportunity cost, and inflation rate '*INF*' representing the uncertainties in the economy. Bank lending rate is expected to have positive effect on bank lending, while interest rate on government securities and inflation are expected to exert negative impact.

Finally, the third set of factors is related to regulatory and prudential measures. The list may include statutory reserve and capital requirements, and provisioning. Reserve requirements *viz.*, statutory reserve ratio (SLR) and cash reserve (CRR) in Indian case, are largely determined by the monetary policy objectives, and prudential requirements. As SLR remained constant at 25 per cent in almost entire period of our study, we have not included it explicitly in our analysis. High CRR is expected to have negative impact on bank credit flow by impounding lendable resources from the banks. Banks are also prescribed to maintain minimum capital to risk-weighted assets ratio (CRAR) according to their total risk exposure. During economic downturn, with increasing risk perception, capital requirements increase and consequently constrain credit flow to respect the minimum CRAR. A higher level of current CRAR, above the minimum prescribed level, gives greater comfort for the banks for future contingency and thus conducive to current credit expansion. In provisioning, particularly non-discretionary provisioning linked to expected loan loss should be counted, as discretionary provisioning related to income smoothening, capital management and signaling serve different purpose for the bank and may not necessarily be a factor in constraining banks' ability to determine credit supply. In the absence of published data on provisioning for

non-performing assets for the entire period, we used ratio of non-performing assets to total assets (NPA) to capture this effect. Increase in NPA is expected to increase provisioning requirements and thus, negatively affect banks ability to provide credit.

Thus, the supply of bank credit can be mathematically given by:

$${}^sL_{it} = \alpha_0 + \alpha_1 D_{it} + \alpha_2 l_{it} + \alpha_3 g_t + \alpha_4 INF_t + \alpha_5 CRR_t + \alpha_6 CRAR_{it} + \alpha_7 NPA_{it} \quad \text{--- (1)}$$

(+) (+) (-) (-) (-) (+) (-)

It may be noted that +/- signs in the brackets indicate theoretical *a priori* expectations.

The demand for bank credit from an individual bank (${}^dL_{it}$) is mainly influenced by macroeconomic variables. Higher economic activity augments credit demand and thus, GDP growth (y) is expected to affect demand for credit positively. Bank lending rate 'l' representing the cost of bank loan will have a negative influence on credit demand. The inflation rate can be used as a proxy for economic uncertainties, and hence have negative influence on demand for bank credit.

Thus, the demand for bank credit can be mathematically given by:

$${}^dL_{it} = \beta_0 + \beta_1 y_t + \beta_2 l_{it} + \beta_3 INF_t \quad \text{--- --- --- (2)}$$

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Equation (2) can be rearranged with bank lending rate as the dependent variable and can be given as:

$$l_{it} = \beta_0' + \beta_1' y_t + \beta_2' {}^dL_{it} + \beta_3' INF_t \quad \text{--- --- --- (3)}$$

Substituting Equation (3) in Equation (1), and accounting for the interaction between demand for and supply of bank credit, we can rewrite Equation (1) as below:

$$L_{it} = \lambda_0 + \lambda_1 D_{it} + \lambda_2 y_t + \lambda_3 INF_t + \lambda_4 g_t + \lambda_5 CRR_t + \lambda_6 CRAR_{it} + \lambda_7 NPA_{it} \quad \text{--- (4)}$$

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We would estimate Equation (4) to examine the role of various factors determining the fluctuation of credit flow in India using bank-wise data. The techniques for panel data analysis are employed for this purpose. Details of these techniques are discussed in Baltagi (1995) and Greene (2003).

III. B. Data Issues

For estimation of the model developed in the above, we have obtained bank-wise data for the period 1995-96 to 2007-08. This period witnessed implementation of an entire set of banking reform measures as per the blue print provided by the Narasimham Committees I and II, and adoption of prudential and regulatory norms as prescribed by Basel norms. This is the most suitable period to examine the role of regulatory capital requirement and loan loss provisioning on the fluctuation of bank credit.

The sample in the study includes 27 public sector banks, 18 Indian private sector banks, and 9 foreign banks (Appendix Table 2). The study has used balanced panel data by using those banks having existence during the entire period of our study. Moreover, the selection of Indian private as also foreign banks was also guided by minimum criteria for lending. In each category, banks selected in the sample contributed to around 95 per cent of their respective aggregate advances in 2007-08.

Bank-wise advances (L) and deposits (D) are expressed in real terms (adjusted by implicit GDP deflator) and used in log-levels. The weighted average interest rates on government securities are obtained from various issues of *RBI Annual Report*. GDP growth rate (GGDP) and inflation (INF) are in terms of percentage. CRR is the weighted average of prevailing CRR during the financial year weighted by number (and fraction) of months it remained effective. For example, if CRR was 6 per cent for 4 months, 5 per cent for 6 months and 10 per cent for the rest 2 months in a year, the weighted average of 6, 5 and 10 was calculated with weights of 4/12, 6/12 and 2/12,

respectively. CRAR is the difference between actual CRAR of a particular bank over the minimum regulatory capital prescribed. The Reserve Bank India had prescribed minimum capital ratio of 8.0 per cent effective from end-March 1996, which was increased to 9.0 per cent effective from end-March 2000. As discussed earlier, in the absence of data availability on bank-wise loan loss provisions for the entire period, from published sources, the ratio of gross non-performing assets to total assets (NPA) has been used as a proxy.

Data pertaining to the estimations were obtained from the *Handbook of Statistics on the Indian Economy 2007-08*, various issues of *Report on Trend and Progress of Banking in India* and *Statistical Tables Related to Bank in India* – all published by the Reserve Bank of India.

IV. ESTIMATION RESULTS

The results of alternate methods of panel data estimations are reported in Table 1. Comparing between the pooled regression and the fixed effects model, the latter seems to be better in terms of adjusted R². To provide a formal test for the two models, the restricted F test statistic was estimated to be 17.10 (p-value: 0.00) rejecting the pooled regression model in favour of fixed effects model. Breusch and Pagan (1980) Lagrange multiplier test ($H_0: \sigma_u^2 = 0$) was applied to test for the random effects model vis-à-vis the pooled model. Under the null, the individual components do not exist and one can use the OLS (pooled) method. Based on the least squares residuals, Breusch and Pagan Lagrange multiplier statistic was estimated to be 1140.87 thus, rejecting the null hypothesis in favour of the random effects model. Finally, taking into account the orthogonality of the random effects and the regressors, the Hausman test can help us comparing the appropriateness of fixed *versus* random effects model. The Hausman statistic, in our case, was estimated to be 22.89 (p-value: 0.00), implying rejection of the hypothesis that the individuals are uncorrelated with other regressors in the model. The Hausman test leads us to the conclusion

that of the two alternatives, fixed effect model is the better choice. To sum up, all the above tests indicate that fixed effects model is most appropriate for our analysis as compared with pooled regression and random effects model. Hence, the study limits the interpretations of the estimated results to the fixed effects model. However, results of alternate specifications are also given for comparative purposes.

It can be observed from Table 1 that all the explanatory variables, except CRR, have expected signs. However, coefficient of CRR is not statistically significant. Interest rate on government securities and inflation, despite having expected negative sign, are not statistically significant. As inflation in India largely remained low and stable, its coefficient not being significant is not surprising. The coefficient of interest rate on government securities not being significant could be due to the fact that banks' investments in these securities to meet SLR requirements, which may not necessarily be sensitive to interest rate.

Estimated results revealed that there is almost one-to-one correspondence between growth of bank credit and deposits. In the context of explaining the

Table 1: Results of Panel Data Analysis

Variables	Pooled (OLS)	Random Effect	Fixed Effect
1	2	3	4
Dependent Variable: Bank Credit (L)			
Constant	0.24	-0.81 *	
D	0.92 *	1.02 *	1.05 *
GGDP	0.03 *	0.03 *	0.03 *
INF	-0.0004	-0.001	-0.001
g	-0.007	-0.01	-0.01
CRR	-0.01	-0.001	0.003
CRAR	0.0002	0.003	0.004 **
NPA	-0.03 *	-0.01 *	-0.01 *
NxT	702	702	702
Adjusted R²	0.96	0.96	0.98
Note: '**' and '***' indicate significance at 1 and 5 per cent level, respectively.			

pro-cyclicality, economic growth, capital requirements and loan loss provisioning are found to be statistically significant. One percentage point increase/decrease in economic growth is estimated to expand/contract bank credit flow by close to 0.03 per cent.

Most important finding of the study is that despite taking into account the influence of other key factors influencing bank credit, NPA and capital requirements are found to have statistically significant influence on bank credit. One per cent increase in NPA leads to 0.01 per cent fall in bank credit. Similarly, 10 per cent increase in CRAR above the prescribed minimum results in 0.04 per cent increase in credit growth. This implies that raising of the minimum capital requirement, which is concomitant with reducing the buffer above the prescribed minimum, will constrain credit growth.

Thus, the estimated results provided evidences of capital requirements and loan loss provisioning reinforcing the pro-cyclicality of bank credit in India since late 1990s.

V. CONCLUSIONS

The present study attempted to examine the behavior of bank credit in India and role of Basel prudential measures reinforcing the pro-cyclicality of bank credit. Beginning with analysing behavior of aggregate bank credit vis-à-vis economic growth since the 1950s, it was observed that upswings/downswings in credit growth were largely associated with similar swings in economic activity. Particularly, the evidences suggested the pro-cyclicality of bank credit becoming pronounced since late 1990s. This was followed by examining the role of capital requirements and loan loss provisioning in exacerbating pro-cyclicality, based on a model derived from supply of and demand for bank credit. The present study improved upon the previous studies by considering an entire set of key factors influencing bank credit rather than partial focus of the earlier studies on capital requirement or loan loss

provisioning. Also, the sample of banks expanded to include Indian private sector and foreign banks which have grown in importance and the period of study encompassed periods of both economic slowdown and rapid growth. The estimated results provided evidences on capital requirements and loan loss provisioning reinforcing pro-cyclicality of bank credit in India since 1990s.

This has two important implications from policy perspective. On the one hand, the evidence of significant influence of capital requirements and loan loss provisioning on bank credit is encouraging in view of its implications for efficacy of these instruments to modulate credit flows. These findings validates the Reserve Bank's initiatives to raise provisioning requirements and risks weights on bank credit to certain sensitive sectors with unprecedented high credit growth during 2005-07. Similarly, reduction of provisioning requirements and risk weights during November 2008 to strengthen and improve credit delivery for sustaining growth momentum in the face of implications of ongoing global financial turbulence on the Indian economy can also be justified.

On the other hand, there are several challenges for counter-cyclical monetary policy measures. In general, a tightening of credit conditions is likely to lead to lower growth and inflation and often there will be no conflict between stabilising credit conditions and inflation control. However, the potency of monetary policy instruments will be conditioned upon synergy with the prudential instruments. Reduction of interest rate to augment credit flow for supporting growth may not be effective when binding capital requirements and loan loss provisioning constrain bank lending. The findings of the present study are in alignment with the observations by Nachane, Ghosh and Ray (2006) that "if the goal of monetary authority is to simultaneously provide credit to the economy and manage interest rates, the revised Basel Accord could pose challenges for monetary policy formulation." On the contrary, in order to make monetary policy effective, loosening regulatory capital requirement and loan

loss provisioning has potential adverse consequences for bank safety and soundness. It is imperative that drawing from the lessons on regulatory and supervisory aspects from the ongoing current global financial turbulence, the issue of coordination between monetary policy and prudential regulatory policies needs to be placed on top of the agenda.

Appendix Table 1: Summary of Previous Studies in India

<i>Study</i>	<i>Period</i>	<i>Sample</i>	<i>Finding</i>
Nachane, Narain, Ghosh and Sahoo (2000)	1997-99 (quarterly)	Public sector banks	No conclusive evidence to support a shift from high-risk towards low-risk asset category by banks.
Nag and Das (2002)	1996-2000	Public sector banks	Stricter risk management and minimum regulatory capital dampens credit supply. Implies regulatory capital requirements reinforcing pro-cyclicality.
Ghosh, Nachane, Narain and Sahoo (2003)	1997-99 (quarterly)	Public sector banks	Banks adjusted their capital ratios by boosting their capital rather than through systematic substitution away from high-risk loans. Thus, capital requirements do not distort the lending choice of banks. Implies capital requirements not a factor generating pro-cyclicality.
Ghosh and Nachane (2003)	1997-2002	Public sector banks	Banks tend to postpone provisioning when faced with favourable cyclical and income conditions, until negative conditions set in. Negative association between loan growth and loan loss provisioning and digging into the capital base during cyclical downswings to make provisions provide evidence of reinforcing credit pro-cyclicality.

Appendix Table 2: List of the Banks included in the Sample

Sl. No.	Name of the Bank	Sl. No.	Name of the Bank
	Public Sector Banks		Indian Private Sector Banks
1	Allahabad Bank	1	Axis Bank
2	Andhra Bank	2	Bank of Rajasthan
3	Bank of Baroda	3	Catholic Syrian Bank
4	Bank of India	4	Centurion Bank of Punjab
5	Bank of Maharashtra	5	City Union Bank
6	Canara Bank	6	Development Credit Bank
7	Central Bank of India	7	Dhanalakshmi Bank
8	Corporation Bank	8	Federal Bank
9	Dena Bank	9	HDFC Bank
10	Indian Bank	10	ICICI Bank
11	Indian Overseas Bank	11	IndusInd Bank
12	Oriental Bank of Commerce	12	ING Vysya Bank
13	Punjab and Sind Bank	13	Jammu and Kashmir Bank
14	Punjab National Bank	14	Karnataka Bank
15	State Bank of Bikaner and Jaipur	15	Karur Vysya Bank
16	State Bank of Hyderabad	16	Lakshmi Vilas Bank
17	State Bank of India	17	South Indian Bank Ltd.
18	State Bank of Indore	18	Tamilnad Mercantile Bank
19	State Bank of Mysore		Foreign Banks
20	State Bank of Patiala	1	ABN Amro Bank
21	State Bank of Saurashtra	2	Bank of America NA
22	State Bank of Travancore	3	Bank of Nova Scotia
23	Syndicate Bank	4	Bank of Tokyo-Mitsubishi UFJ, Ltd.
24	UCO Bank	5	BNP Paribas
25	Union Bank of India	6	Citibank N.A.
26	United Bank of India	7	Deutsche Bank AG
27	Vijaya Bank	8	HSBC Ltd.
		9	Standard Chartered Bank

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