

REGULATION OF BANKS' CAPITAL AND MACRO-STABILITY – A THEORETICAL APPRAISAL

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[Following the adoption of the New Economic Policy (NEP) by India in July 1991, Government of India (GoI) has started viewing banks as commercially organized profit driven financial institutions whose viability depends upon their ability to make profit. Like all capitalist economies, India is also subject to trade cycles and onset of a recession leads to a drop in banks' profit levels and an increase in their stock of non-performing assets. This prompts the government to ask banks to tighten lending norms and maintaining adequate capital buffer as mandated by minimum capital requirement norm. This paper develops a simple baseline model to examine the implications of this kind of a policy. It shows that the policy noted above deepens recession, increases inequality and exacerbates the problem of non-performing assets and lowers profit. It also shows that, instead of taking the banks and the defaulting firms to task for a factor that is completely beyond their control, the best way of tackling this problem is to adopt appropriate stabilization programmes to counter the recession.]

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Introduction

The stability of banking sector is central to the stability of the overall financial sector in country and after the advent of the globalization and in wake of its resultant spill-over implication of any economic disturbance or turmoil; the concern over financial stability has got further intensified. In recognition of this matter, Bank for International Settlement ramped up the global standard on supervision of banking institutions in the name of Basel norms. A key element of

this global benchmark is the regulation of capital reserve of a banking institution which mandate threshold extent of capital reserve to be kept in proportion with bank's total risk weighted assets in terms as minimum capital requirement. Although this norm was intended for enhancing the resilience of banks to any adverse economic shock or financial predicament, is arguably propitious for ensuring stability. However, the international experience indicates a

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serious downside of this capital norm which makes it some-what self defeating in nature. In the wake of this minimum capital requirement, banks might turn more vulnerable to economic shocks in the way that an outbreak of recession worsens the capital adequacy ratio and thereby makes it difficult for banks to cope with the Basel mandate. Now this perhaps has jeopardising outcome for banks in terms of hampered credit mobilization on account of cut in loan-making consequent upon the banks' failure in complying with the capital norm. Now an unequivocal implication of this dispensation is that a cut in credit flow in the economy is likely to magnify ongoing recession and thereby make the economy leap into more heightened crisis. Once this happens, the propensity of defaulting on loan will rise, leading to an amplification risk on banks' sustainability and subjecting banks to a bigger quandary. Thus an attempt to fix hidden fault line might serve to aggravate it further. At this juncture, the current paper is intended at highlighting on how regulation of banks' capital base in terms of minimum capital requirement may not go down well with the stability of banking sector and thereby is likely to push the financial sector out of gears.

Literature Review

Alan S. Blinder (1985) develops two macroeconomic models in which central bank policy has real effects on the supply side of the economy due to credit rationing. In each model, there are two possible regimes, depending on whether credit is or is not rationed. Starting from

an un-rationed equilibrium, either a large enough contraction of bank reserves or a large enough rise in aggregate demand can lead to rationing. Monetary (fiscal) policy is shown to be more (less) powerful when there is rationing than when there is not. In the first model, credit rationing reduces working capital. There is a failure of effective supply in that credit-starved firms must be reducing the production below national supply. The resulting excess demand in the goods market may trigger a rise in prices and reduce the real supply of credit further, leading to further reductions in supply and a stagflationary spiral. In the second model, credit rationing reduces investment, which cuts into both aggregate demand and Supply. Despite the effect on demand, stagflationary instability is still possible. Besides, it has been illustrated herein that a rise in government spending crowds out investment in the rationed regime but crowds in investment in the un-rationed regime.

KM. Shahjan (1998) sought to examine the warranty behind the RBI's claim regarding the decline in the non-performing assets in the bank as on the March 1997 from the previous year to the tune of more than 50 per cent and in connection to this the relation between the magnitude of non-performing assets of the banks and their exposure to priority sector credit. This apart the paper questions the sudden shift of RBI's stance on public disclosure of NPA status from gross sense to the net sense in 1997 which sparked off controversy over whether NPA had indeed declined over the said period.

Bloem and Gorter (2001) suggested that a more or less predictable level of non-performing loans, though it may vary slightly from year to year, is caused by an inevitable number of 'wrong economic decisions' by individuals and plain bad luck (inclement weather, unexpected price changes for certain products, *etc.*). Under such circumstances, the holders of loans can make an allowance for a normal share of non-performance in the form of bad loan provisions, or they may spread the risk by taking out insurance. Enterprises may well be able to pass a large portion of these costs to customers in the form of higher prices. For instance, the interest margin applied by financial institutions will include a premium for the risk of non-performance on granted loans. At this time, banks' non-performing loans increase, profits decline and substantial losses to capital may become apparent. Eventually, the economy reaches a trough and turns towards a new expansionary phase, and as a result the risk of future losses reaches a low point, even though banks may still appear relatively unhealthy at this stage in the cycle.

Indira Rajaraman et.al (2002) in the paper ' Non-Performing Loans of PSU Banks' attempts a panel data regression analysis based on 27 PSU banks covering a period of five years ending in 1999-2000 to illuminate on the variation of the nonperforming loans within class of banks. The finding of this exercise enables one to group the banks with more than average NPA into those which are explained by the operational efficiency,

as measured by operating profit as percentage of working funds and those with below average NPA are grouped into those explained by high operating efficiency and those where operational efficiency leaves an unexplained negative residual. Comparing the regional concentration of these with high-NPA banks, there is clear scope for pair-wise comparative studies of banks in the same region of operation so as to identify bank-specific factors accounting for their very different outcomes in terms of NPAs.

Rajeshwari Krishnan (2002) focused on the problem of swelling non-performing assets in banks and financial institution of the country posing serious threat to the financial sector. She found that securitization can be used for the liquidating the illiquid and long terms debt like loan receivables of the financial institutions or bank by issuing marketable securities against them. She concluded that the SARFAESI act is definitely a big leap forward not only in the field of NPA management but also promoting the securitizing market in India. The act may be required to be fine tuned to bring in 'natural justice'.

In another study it has been posited that the sheltering of weak institutions while liberalizing operational rules of the game is making implementation of operational changes difficult and ineffective (Prashanth K. Reddy, 2002). Moreover, it has been argued that changes required to tackle the NPA problem would have to span the entire gamut of judiciary, polity and the bureaucracy to be truly effective. This paper has also touched

upon the experiences of other Asian countries in handling of NPAs. It further looks into the effect of the reforms on the level of NPAs and suggests mechanisms to handle the problem by drawing on experiences from other countries.

Amitabh Joshi (2003) conducted a survey and has found that Profitability and Viability of Development Financial Institutions are directly affected by quality and performance of advances. The basic element of Sound NPA Management System is quick identification of Non-performing advances, their containment at minimum levels and ensuring that their impingement on the financial system is at low level. Excessive reliance on Collaterals has led Institutions to long drawn litigations and hence it should not be sole criteria for sanction. Banks should manage their exposure limit to few borrower(s) and linkage should be placed with net owned funds for developing control over high leverages of borrower level. Study also revealed that exchange of credit information among banks would be immense help to them to avoid possible NPAs. Management Information system and Market intelligence should be utilized to their full potential.

Datta Chaudhuri (2005) examined the "Resolution Strategies for Maximizing Value of Non-Performing Assets (NPAs)". The article indicates that declining capital adequacy adversely affects shareholder value and restricts the ability of the bank/institution to access the capital market for additional equity to enhance capital adequacy. So, if a resolution strategy for

recovery of dues from NPAs is not put in place quickly and efficiently, these assets would deteriorate in value over time and little value would be realized at the end, except may be its scrap value. The purpose of this paper is to indicate the various considerations that one has to bear in mind before zeroing on a resolution strategy and provides a State - Resolution - Mapping (SRM) framework. However, the paper has not specifically discussed about the various resolution strategies that could be put in place for recovery from NPAs, and in particular, in which situation which type of strategy should be adopted.

Griffith-Jones et al (2002) has pointed out that Basel-II may significantly overestimate the risk of international lending to developing economies. It has also pointed out hereby, in particular, that linking of the sovereign rating to the regulatory capital, the sovereign ratings could have an unfavourable effect on the credit flows to the emerging market economies as the credit rating of the developing and emerging countries are not as high as the high income countries.

A host of literature have found the credit -rating being pro-cyclical based on which the risk weights for various categories of assets held by the banks are evaluated (Ferri et al , 1999 and Monfort and Mulder, 2000).It has been discovered that the credit rating agencies upgrade sovereigns in times of sound market conditions and downgrade in turbulent times.

Rupa Rege Netsure (2005) has strongly highlighted some basic problem concerned

with Basel-II Accord that was framed to make the minimum capital requirements more risk sensitive. First of all, given that this new accord had been flouted out to affect essentially the bank of international presence which was compliant with Basel-I Accord and Core Basel Principles. Hence it could not be of immediate priority for the banks of developing nations as its implementation would require a thorough up-gradation of the technology and human resources leading to a shift in regulator's attention from supervision to implementation. It has been pointed out that Basel-II accord makes discrimination against the banks with less sophisticated risk management system, particularly the small banks, by making them embrace the 'Standardized Approach' to the assessment of credit risk; whereby these are to be made dependent on external rating agencies and this in-turn renders them less risk sensitive. Moreover, when a business downturn is in space, a bank's capital base is likely to be eroded by loan losses. As a result of this, its existing non-defaulted borrowers will also be downgraded by the relevant credit risk models, forcing the bank to hold more capital against its current loan portfolio. To the extent that it is difficult for the bank to raise fresh external capital in bad times, it will be forced to curtail its lending activity, thereby contributing to the worsening of the initial downturn. Thus, Basel II is likely to accentuate cyclical fluctuations - a price too high for emerging economies to bear once they adopt the advanced IRB system. There is also a fear that too much regulation under Basel II will adversely affect the risk

appetite of Indian banks and their lending to credit-starved sectors posing a major challenge for the RBI in maintaining a healthy credit momentum amid this tighter risk-sensitive framework.

Bhatia (2007) presents an empirical approach to the analysis of Non-Performing Assets (NPAs) of public, private, and foreign sector banks in India. The NPAs are considered as an important parameter to judge the performance and financial health of banks. The level of NPAs is one of the drivers of financial stability and growth of the banking sector. This paper aims to find the fundamental factors which impact NPAs of banks. A model consisting of two types of factors, viz., macroeconomic factors and bank-specific parameters, is developed and the behaviour of NPAs of the three categories of banks is observed.

Another study by Shruti J. Pandey et.al (2013) has come across an attenuation in the non-performing asset as the percentage of gross advance for the scheduled commercial banks during the post reform period from 15.7 % in 1997 to 2.25% in 2008; which has been attributed to the adoption of prudential norms regarding income and asset classification as per recommendations of Committee on Financial System headed by M.Narasimham (1991). However the study shows a surge in the non-performing asset in the recent years which has been considered as the aftermath of the global recession coupled with slowdown of the domestic economy fetching adverse impact on small and medium enterprises adversely affecting

the credit quality. Moreover deterioration of situation in terms NPA has been found particularly for the PSBs which the aforesaid study claims to be due to the large exposure to the big worth corporate loans and the shift to the system based recognition of non-performing asset from the previously prevailing manual set-up eliminating managerial discretion in reporting. This apart the study provides a strong evidence for the pro-cyclical nature of non-performing asset in the sense that a rise in same is reflection of the domestic economic meltdown. However, in regard to the debt recovery the study points to some improvement in cases of public and private sector banks in 2011-12 in terms of the rise in recovery ratio with the foreign banks lagging behind. Moreover, the major volume of the total debt recovered has been found to be coming up through SARFAESI route over the years from 2007-08 up to 2011-12.

A recent study made by Ratna Barua (2018) has indicated that the loan to assets ratio, used as a proxy to liquidity ratio, found to have a significant negative impact on CRAR. The results find a significant negative impact of deposit to total non-equity liabilities on CRAR. As per the estimation, 1 per cent increase in overall CRAR of scheduled commercial banks would reduce the loan growth by 1.06 per cent from the existing level. However, the impact was much stronger in Basel III period as higher regulatory capital requirements made lesser funds available for lending.

A Baseline Model for Examining Banking Sector Reforms

We first develop a simple baseline model to examine the implications of the recent banking sector reforms in India. We consider a small open economy divided into two sectors: a real sector and a financial sector. We focus on the real sector first.

Real Sector

In the real sector, aggregate output or GDP is demand determined. The equilibrium condition of the real sector is given by

$$Y = cY + I(r) + G + X\left(\frac{P^*e}{P}, Y^*\right) - \frac{P^*e}{P}M\left(\frac{P^*e}{P}, Y\right) \quad \dots(1)$$

We assume that government expenditure is financed by borrowing from the Central Bank so that

$$G = \frac{dH}{P} \quad \dots(2)$$

In (2), dH denotes increase in the stock of high-powered money. For the time being, we ignore cross-border capital flows and consider the flexible exchange rate regime. The BOP equilibrium condition is, therefore, given by

$$X\left(\frac{P^*e}{P}, Y^*\right) - \frac{P^*e}{P}M\left(\frac{P^*e}{P}, Y\right) = 0 \quad \dots(3)$$

Financial Sector

We assume for simplicity that the only kind of financial institutions that exist in the financial sector are banks. Banks raise

their funds by inviting deposits and also by selling equities. We ignore here the secondary market in equities. Banks sell new equities in the market at a fixed price. At the fixed price, either they are able to sell as many equities as they want or they face demand constraint. We consider both the cases here. We postulate for simplicity that only banks issue equities.

We assume that savers hold their saving in the form of equity, bank deposits and currency. They hold q and q_1 fractions of their saving in the form of equity and currency respectively and the rest in the form of bank deposits. We also assume here that banks do not hold any excess reserve and they sell equities only to meet the capital adequacy requirement. Given these assumptions, the amount of new equities the banks want to sell is given by

$$E^s = \frac{1}{\theta} L^s = \frac{1}{\theta} (1 - \rho) dD \quad \dots(4)$$

In (4), $E^s \equiv$ planned supply of new equity by the banks, $L^s \equiv$ planned supply of new bank loans, $\frac{1}{\theta} \equiv$ capital adequacy ratio, $\rho \equiv$ CRR, and $dD \equiv$ new deposit received by the banks.

Demand for new equities comes from the savers who hold q fraction of their saving in the form of new equities. Thus,

$$E^d = q \cdot (1 - c)Y \quad \dots(5)$$

New deposits received by the banks are given by

$$dD = (1 - q - q_1) (1 - c)Y \quad \dots(6)$$

Substituting (6) into (4), we get

$$E^s = \frac{1}{\theta} (1 - \rho) (1 - q - q_1) (1 - c)Y \quad \dots(7)$$

There are clearly two possibilities, $E^s > E^d$, $E^s \leq E^d$. In the first case, banks are rationed in the equity market. Hence, their planned supply of new loan will be given by

$$L^s = \theta E^d = \theta q(1-c)Y \quad \dots(8)$$

In the second case, banks are able to sell as much new equity as they plan to. Hence, their supply of new loans is given by

$$L^s = \theta E^s = (1-\rho) (1 - q - q_1) (1 - c)Y \quad \dots(9)$$

We also assume that the banking sector is oligopolistic and the interest rate charged by banks on loans is rigid and depends only upon the repo rate. Denoting the lending rate of banks and the repo rate by r and r_p respectively, we have

$$r = r \left(\begin{matrix} r_p \\ + \end{matrix} \right) \quad \dots(10)$$

Demand for loans comes from the investors, who finance their entire investment with bank loans. In this connection, we divide aggregate investment into two parts. One part of investment is undertaken by the quality borrowers whom banks never ration, and the other part is undertaken by those investors whom banks ration. We denote the former by I_0 and the latter by I_1 and write the investment function as

$$I = I_0(\rho(\rho_p, \varepsilon_0)) + I_1(\rho(\rho_p, \varepsilon_1)) \quad \dots(11)$$

In (11), ε_0 and ε_1 denote expectations of the two types of borrowers. We assume

here that at the given interest rate, non-quality investors are rationed in the credit market and investment of the non-quality borrowers is determined by the supply of loans. Banks, however, ration credit. They give loans only to those whom they consider creditworthy. Normally, they cannot disburse as much credit as they want to. Taking this into account, we modify the loan supply equations (8) and (9) as follows:

Eq.(8), which gives the loan supply equation in the first case, is given by

$$L^s = I_0(r(r_p), \varepsilon_0) + \beta(\underline{N}, \underline{R}) [(\theta q(1-c)Y - I_0(r(r_p), \varepsilon_0))] \quad 0 < \beta \leq 1 \quad \dots(12)$$

In the second case, eq. (9) is written as

$$L^s = I_0(r(r_p), \varepsilon_0) + \beta(\underline{N}, \underline{R}) [(1-\rho)(1-q-q_1)(1-c)Y - I_0(r(r_p), \varepsilon_0)] \quad 0 < \beta \leq 1 \quad \dots(13)$$

In (12) and (13), β denotes the fraction of the banks' potential supply of loans that banks are able to disburse to their non-quality borrowers. β is made a decreasing function of both N , which denotes the stock of non-performing assets of the banks, and R , which denotes bank regulations that make banks more cautious regarding their lending behavior. Since, by assumption, banks ration credit, aggregate investment is determined by supply of bank credit. Hence investments in case 1 and case 2 are given by (14) and (15) respectively.

$$I = I_0(r(r_p), \varepsilon_0) + \beta(\underline{N}, \underline{R}) [(\theta q(1-c)Y - I_0(r(r_p), \varepsilon_0))] \quad \dots(14)$$

$$I = I_0(r(r_p), \varepsilon_0) + \beta(\underline{N}, \underline{R}) [(1-\rho)(1-q-q_1)(1-c)Y - I_0(r(r_p), \varepsilon_0)] \quad \dots(15)$$

In this backdrop we shall focus on the implication of capital adequacy norm which is a binding constraint for banks in extension of credit.

Case of Binding CRAR Norms

In this case the supply of equity issued by the banks is greater than the demand for the equity. i.e $E_s \geq E_D$. Thus as what follows from the expression of E_D and the equation showing the relation between CRAR (θ) and supply new of loans (L_s):

$$L_s = \theta q(1-c)Y \quad \dots\dots(1)$$

Given that the banks ration the non-quality borrowers and investments made by the quality borrowers depends on the rigid interest rate (\bar{r}) and future profit expectation (ε_0), the amount aggregate private investment is $I(\bar{r}, \varepsilon_0) + \beta[\theta q(1-c)Y - I(\bar{r}, \varepsilon_0)]$. Thus, the restated product market equilibrium condition is :

$$Y = cY + I(\bar{r}, \varepsilon_0) + \beta[\theta q(1-c)Y - I(\bar{r}, \varepsilon_0)] + G + \chi \left(\frac{eP^*}{P}, Y^* \right) - \frac{eP^*}{P} M \left(\frac{eP^*}{P}, Y \right)$$

However given that the exchange is flexible in nature and therefore an disequilibrium in the foreign exchange is eliminated by the commensurate adjustment in foreign exchange rate

$$\chi \left(\frac{eP^*}{P}, Y^* \right) - \frac{eP^*}{P} M \left(\frac{eP^*}{P}, Y \right), \quad \text{is}$$

effectively a vanishing term in the product market equilibrium condition which henceforth can restated as :

$$Y = cY + I(\bar{r}, \varepsilon_0) + \beta[\theta q(1-c)Y - I(\bar{r}, \varepsilon_0)] + G \quad \dots\dots(2)$$

Now we shall look at the multiplier effect of increase in G on Y .

This can be determined by totally differentiating (2) holding everything other than G constant and this yields :

$$dY = \frac{dG}{1 - [c + \beta\theta q(q - c)Y]} \quad \dots(3)$$

Now the impact of rise in G on exchange rate e can be determined from the following equation

$$de = \frac{pM_Y}{\frac{P^*}{P} [\eta_x + \eta_m - 1]} dY$$

as

$$de = \frac{pM_Y}{\frac{P^*}{P} [\eta_x + \eta_m - 1]} \left[\frac{dG}{1 - [c + \beta\theta q(q - c)Y]} \right] \quad \dots(4)$$

The multiplier effects stated above can be explained intuitively. Following an increase in G by dG , *ceteris paribus*, leads an increase in aggregate demand for goods and services and thereby an excess demand in the product market. Now to make the product revert to the equilibrium, real aggregate output Y needs to rise. Now following an unitary rise in Y , excess demand falls by $1 - [c + \beta\theta q(q - c)Y]$. This is so because an unitary increase in Y raises the consumption by c units and savings by $(1 - c)$ units. Now out of this increased saving, the demand for equity issued by the banks rise by $q(1 - c)$ units. Given, that the amount the banks can raise by issuing equity is constrained by its demand and supply of new loans is

in turn contingent upon the amount of equity that the banks can sell, the supply of loans goes up by $\beta\theta q(1 - c)$. The increase in the supply of new loans results in the rise in investment by $\beta\theta q(1 - c)$. Moreover, import will increase consequent upon the unitary increase in Y to the tune of pM_Y ; but the exchange rate being flexible will rise to raise net export by pM_Y so that the trade balance rebounds to zero balance. Thus, after Y rises by one unit, excess demand falls by $1 - [c + \beta\theta q(q - c)Y]$ and hence to offset the excess demand coming up against the rise in dG , Y has to rise by value of the multiplier effect.

Again, the increase in Y leads to an increase in import at the rate of pM_Y for every one unit rise. This in turn leads to deficit in balance of trade, given that it was in zero balance initially and hence excess demand in the foreign exchange market by pM_Y in terms of the domestic goods. Now since exchange rate is flexible, this excess demand will prompt an increase in the exchange rate which in turn will clear the foreign exchange market; thereby restoring balance of trade in balance. Now if foreign exchange rate rises by one unit, excess demand in the foreign exchange market declines by

$\frac{P^*}{P} [\eta_x + \eta_m - 1]$ and therefore following an unitary increase in Y , foreign exchange

rate has to rise by $\frac{pM_Y}{\frac{P^*}{P} [\eta_x + \eta_m - 1]}$. Thus,

we have the result that rise in exchange rate following an increase in G by dG as what is illustrated in (4).

Impact of adverse invest sentiments on Y

Now we shall look at the consequence of the worsening of the investment sentiment on real aggregate output as illustrated by a fall in ε_0 indicating a deterioration of expectation of the quality borrowers about future profit. Now, we shall examine the impact of this adverse shock on Y mathematically by the totally differentiating (2) holding everything else other than ε_0 constant. Thus we have what follows below.

$$dY = \frac{(1-\beta)I_{\varepsilon_0} d\varepsilon_0}{1-[c+\beta\theta q(1-c)Y]} \quad \dots(5)$$

The above can be explained intuitively. The worsening of future profit expectation would result in the contraction of private investment by $(1-\beta)I_{\varepsilon_0} d\varepsilon_0$. Now the excess supply that would arise as a result of this contraction would require a fall in Y to make the product market rebound to equilibrium. Now for every unitary fall in Y, excess supply in the product market declines by $1-[c+\beta\theta q(1-c)Y]$ and this shows that the required fall in Y is what is illustrated in (5). Now it is emergent that the degree of multiplier effect depends on θ which stands for the regulated capital adequacy ratio and so is that a higher is θ greater is the intensity of impact of the adverse investment sentiment. Thus we have following proposition

Proposition 1: The presence of regulatory norm on capital adequacy deepens the deleterious consequence of any adverse investment shock. Moreover, higher the capital adequacy

ratio more exorbitant is the contraction of aggregate output resulting in from such investment pessimism.

Let us now make the analysis a bit deeper by the introducing a linkage between the stock of non-performing assets(N) and the fraction of total supply of new loan extended to the non-quality borrowers. It is in this way that rise in N makes the banks more sceptical in lending to the non-quality borrowers. Thus we have :

$$N = N(\bar{Y}-Y), N_y > 0 \quad \text{and} \quad y = \bar{Y}-Y \quad \dots(6)$$

$$\beta = (N), \beta_N < 0 \quad \dots(7)$$

Revising the product market equilibrium condition incorporating (6) and (7) and carrying out the comparative exercise with respect to G on Y and e gives us the following.

$$dY = \frac{dG}{1-[c+\beta\theta q(1-c)Y+\beta_N(-N_y)\theta q(1-c)Y]} \quad \dots(3')$$

and

$$de = \frac{pM_Y}{\frac{P^*}{P}[\eta_x + \eta_M - 1]} \left[\frac{dG}{1-[c+\beta\theta q(1-c)Y+\beta_N(-N_y)\theta q(1-c)Y]} \right] \quad \dots(4')$$

The third term in (3)' reflects the rise in the credit disbursement to the non-quality borrowers following the fall in the non-performing asset with the improvement in the aggregate demand condition brought about by the rise in G and resultant contraction in the output gap.

This makes the multiplier effect more intense than it was in the previous situation as evident from the difference of (3)' from (3) as $\beta_N(-N_y)$ is positive.

Similar consequence will be witnessed when quality borrowers turns pessimistic about the prospect. This has been illustrated below where (6) and (7) have been incorporated in (5).

$$dY = \frac{(1-\beta)I_{\varepsilon_0} d\varepsilon_0}{1 - [c + \beta\theta q(1-c)Y + \beta_N(-N_y)\theta q(1-c)Y]} \dots(5)'$$

Thus the contraction of Y will be much more cogent as a result of the bearish outlook of the quality borrowers.

There can be another variant of this analysis where the willingness of the non-bank public to hold shares issued by the banks is affected by the rise in non-performing asset. This is because, an increase in non-performing assets in the banks will attenuate their net worth and thereby the market value of the banks; so is their share price. Thus, it is worth relating the fraction of savings held in bank shares with the stock of non-performing ; where a rise in the stock of non-performing asset is associated with the fall in q. Therefore, we have the following:

$$q = q(N), \quad q' < 0 \dots(8)$$

Now incorporating the responsiveness of propensity to save in form banks' shares in (3) and (4) we get following.

$$dY = \frac{dG}{1 - [c + \beta\theta q(1-c)Y + \{\beta_N q + q'\}(-N_y)\theta(1-c)Y]} \dots(3)''$$

and

$$de = \frac{pM_Y}{\frac{P^*}{P}[\eta_x + \eta_M - 1]} \left[\frac{dG}{1 - [c + \beta\theta q(1-c)Y + \{\beta_N q + q'\}(-N_y)\theta q(1-c)Y]} \right] \dots(4)''$$

The revelation of (3)'' suggest that the multiplier effect of increase in government expenditure will be stronger to the extent to which an improvement in the state of aggregate demand emanating from the expansionary fiscal policy escalates the net worth of the banks and raises the fraction of the increased savings invested in banks' shares by $q'(-N_y)\theta q(1-c)$ for every unitary increase in Y. The reason being that the availability of more funds in the form of equity will result in the expansion in the supply of new loans given that the capital adequacy norm is binding.

The impact of the bearish investment sentiments can be also recast in the light of the afore mentioned as shown below.

$$dY = \frac{(1-\beta)I_{\varepsilon_0} d\varepsilon_0}{1 - [c + \beta\theta q(1-c)Y + \{\beta_N q + q'\}(-N_y)\theta(1-c)Y]} \dots(5)''$$

The reason behind the adverse impact of the worsening expectation of future profit being more intense is that the aggregate demand shock arising therein leads to the accumulation of non-performing asset which in turn makes people unwilling to invest in the shares in anticipation of the deterioration of share price following the

decline in the banks' net worth. This contraction in Y in turn leads to the furtherance of the non-performing assets. Thus we have the following proposition.

Proposition 2: Introduction of net worth effect of non-performing assets exacerbates the recession arising out of investment pessimism and in turn makes the problem more acute.

Dynamic Illustration of the malignant effect of CRAR

To trace out the counterproductive nature of CRAR we consider a linear functional expression of the non-performing asset as

$$N_t = n(\bar{Y} - Y_{t-1}) + \phi - \frac{d\bar{H}}{P}; n, \phi > 0 \quad \dots(1)$$

$$q_t = \delta N_t, \delta < 0 \quad \dots(2)$$

Substituting (1) and (2) in the product market equilibrium condition (as shown below)

$Y_t = cY_t + \bar{I} + \beta[\theta q(1 - c)Y_t - \bar{I}] + G$, we have:

$$Y_t = cY_t + \bar{I} + \beta \left[\theta \delta \left\{ n(\bar{Y} - Y_{t-1}) + \phi - \frac{d\bar{H}}{P} \right\} (1 - c) Y_t - \bar{I} \right] + G \quad \dots(3)$$

Now solving (3) for Y_t we find the equilibrium level of output in period t as

$$Y_t = \frac{(1 - \beta)\bar{I} + G}{1 - \left[c + \left\{ \beta \theta \delta n(\bar{Y} - Y_{t-1}) + \theta - \frac{d\bar{H}}{P} \right\} (1 - c) \right]} \quad \dots(4)$$

The above equation depicts that the equilibrium level of output in period t i.e. Y_t depends on the equilibrium level of output in period $t - 1$ i.e. Y_{t-1} . Moreover, it is revealed hereby that a higher Y_{t-1} is associated with Y_t . The reason being that a higher output in the previous period leads to a lower gap with respect to \bar{Y} so that the stock of non-performing asset in period t is lower, resulting in the improvement in the net worth, given everything else remaining unchanged. This henceforth will prompt a greater holding of the banks' equity and thereby results in the increased demand for equity. Now given the binding nature of capital adequacy norm, greater is the demand for equity larger is the room available to the banks in extending loans. As a result, the supply of new loans gets increased which translates in to higher private investments and thereby higher Y_t . Mathematically, the positive relation between Y_t and Y_{t-1} can be traced out by differentiating (4) with respect to Y_{t-1} as what follows:

$$\frac{dY_t}{dY_{t-1}} = -\gamma\beta\theta\delta n > 0 \quad \dots(5)$$

where

$$y = \frac{(1 - \beta)\bar{I} + G}{\left[1 - \left[c + \left\{ \beta \theta \delta n(\bar{Y} - Y_{t-1}) + \theta - \frac{d\bar{H}}{P} \right\} (1 - c) \right] \right]^2}$$

Now one can attempt to classify the current exercise into two basic possibilities as :

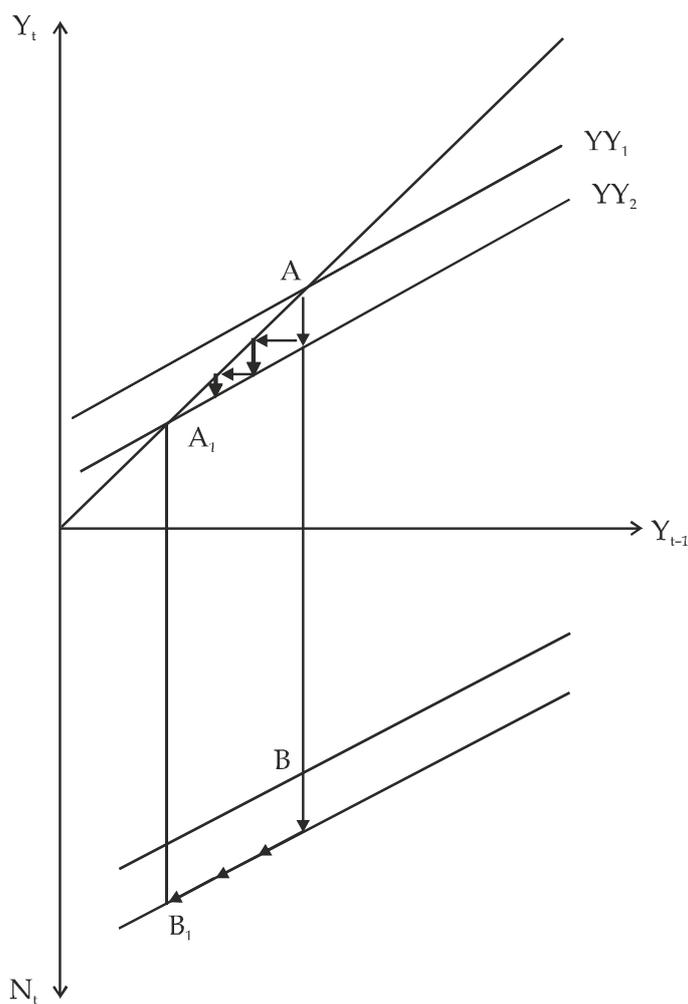
Possibility I: $0 < \frac{dY_t}{dY_{t-1}} < 1$

Possibility II: $\frac{dY_t}{dY_{t-1}} > 1$

The implication of each possibility for the impact of investment pessimism can be

depicted in the light of the phase diagrams illustrating the difference equation (3) denoted by YY schedule, the slope of which is as defined by (5).

Figure 1



In the above diagram (Fig. - 1), it has been shown that after the investment pessimism gains ground the economy moves from A to A₁ as the adjustments

runs through new YY schedule: YY₂ resulting in the cumulative contraction of real aggregate output and rise in non-performing asset from B to B₁.

Figure 2

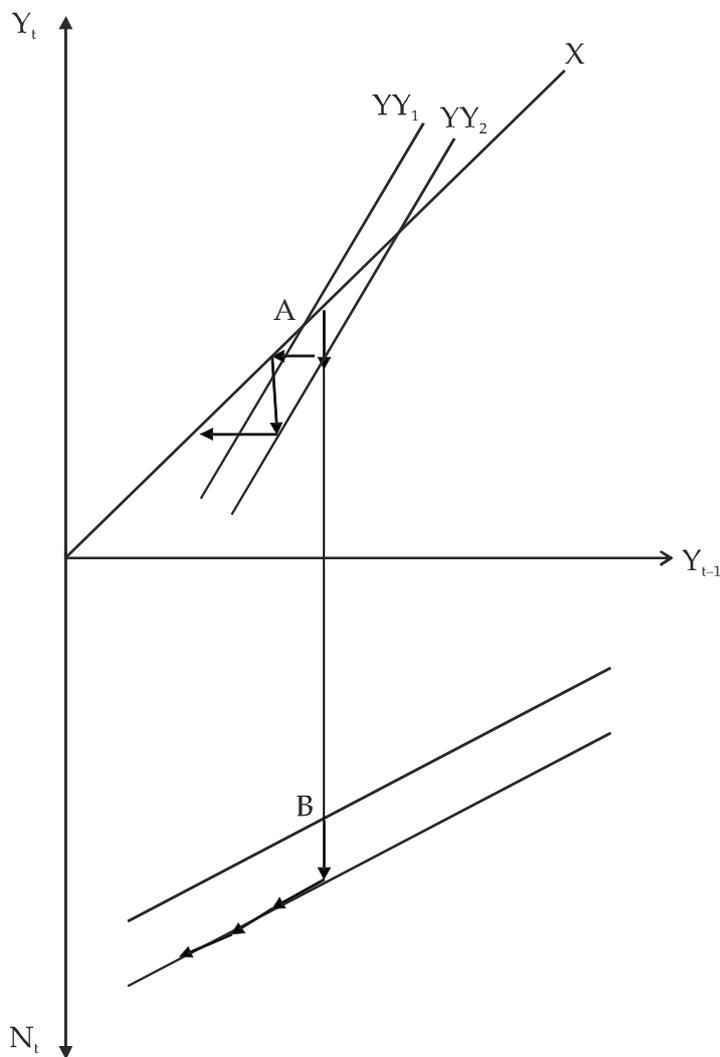


Figure 2 hints at the unstable steady state equilibrium where after the outbreak of investment pessimism, the economy moves from *A* permanently thereby resulting in the perpetual contraction of real aggregate output and rise in non-performing asset from *B*.

Let us now explain the process leading to

the contraction of *Y* in successive time periods following the decline in investment (\bar{I}) due to the deterioration of the future profit expectations in period *t*. Following the contraction of investment by $d\bar{I}$, the negative multiplier effect sets in leading to the fall in *Y* by

$\frac{(1-\beta)d\bar{I}}{1-[c+\beta\{q+n\delta Y\}\theta(1-c)]}$ units. In the next period, there occurs a rise in non-performing asset to the tune of

$n\frac{(1-\beta)d\bar{I}}{1-[c+\beta\{q+n\delta Y\}\theta(1-c)]}$ and as a result of which the propensity to save in banks'

share dips by $\frac{(1-\beta)d\bar{I}}{1-[c+\beta\{q+n\delta Y\}\theta(1-c)]}$.

Thus in period t+1, supply of new loans declines setting in the second bout of the negative multiplier effect on Y to the tune

of $\delta n\frac{(1-\beta)d\bar{I}}{1-[c+\beta\{q+n\delta Y\}\theta(1-c)]^2}$. Now as the effect wades through time, in period

t+2, Y falls by $\delta n^2\frac{(1-\beta)d\bar{I}}{1-[c+\beta\{q+n\delta Y\}\theta(1-c)]^3}$

and this goes on until the new steady state is arrived at, given that possibility I is true. However, the fall in Y will be perpetual if possibility II is true where the economy never rebounds to the new steady state. Now, it is to be noted herein that had there been no such capital adequacy restriction, the fall in Y would not have been transmitted to the successive time periods and hence the recession would have been less prolonged. Thus we have following proposition:

Proposition 3: The attempt to regulate capital adequacy of the banks acts as an in-built destabilizer as it accentuates the macroeconomic crisis ushered in by the investment pessimism and thereby makes the problem of non-performing assets more rampant.

Conclusion

Banks perform very important social functions. They mobilize savings of the savers and transfer them to the borrowers. Banks cannot perform these functions effectively if they are commercial organizations, whose objective is to make profit and whose viability depends upon whether they are able to make profit. As enshrined in Indian Constitution and, as should be the responsibility of every civilized society, to provide equal opportunity to everyone, every individual should have access to a safe avenue for holding their savings. Banks cannot achieve this, if they are commercial organizations. If they are commercial organizations, they may not consider it profitable to make themselves accessible to every saver. Moreover, they will be subject to vagaries of capitalist market forces. Hence, their liabilities will not be fully safe. They will, therefore, not be able to fully mobilize all the savings of the savers. In fact, the kind of instabilities that a capitalist economy is usually subject to and given the performance of banks in advanced capitalist economies, banks are unlikely to have any access to the major part of savings of the savers. Thus, for banks to be able to effectively mobilize savings generated in the economy, they have to be social institutions owned by the government and protected by the government fully from the vagaries of market forces. Again, an economy, to perform efficiently and equitably, should meet all the genuine credit needs of people and firms – credit needs that arise out of the necessity of producing and/or

consuming essential goods. Again, when banks are commercially organized, they will disburse credit on the basis of profit criteria. Hence, they will ration small and medium producers, even when they are engaged in the production of essential goods, while credit needs of quality borrowers, even when they use the credit to produce luxury goods, are fully met [see in this connection Bernanke, Gertler and Gilchrist(1996)]. This may lead to severe macroeconomic instability giving rise to shortages of food and other mass consumption goods and large imports of components required for luxury production. These large non-essential imports may lead to steep increase in exchange rate raising domestic price level and, thereby, worsening trade balance further. Shortages of mass consumption goods coupled with steep increase in the exchange rate generate strong inflationary and recessionary forces. Thus, when banks are commercially organized in a poor and dependent country like India, they fail to meet genuine credit needs of the economy and profit driven bank credit allocation may generate strong destabilizing inflationary and recessionary forces. Banks should be treated as social institutions owned and protected by the government from the vagaries of market forces. They should mobilize saving to the fullest possible extent by providing every individual with a fully safe avenue of saving and utilize the savings to meet all genuine essential credit needs of the economy. Private profit driven banks perpetrate the kind of disasters that we

witnessed in 1991 in Japan, in 2007 in the US and in 2008 in Europe.

Commercially organized banks, as pointed out above and as amply evidenced by the disastrous experiences of the advanced capitalist countries, give rise to severe macroeconomic instability through gross misallocation of bank credit [see in this connection Blinder and Zandi,(2010^a, 2010^b), Mishkin (2011), Koo (2008) et al.]

Commercially organized banks, public or private, are subject to vagaries of market forces and, as argued in the present paper, government's effort at arresting the growth of their non-performing assets following an onset of recession may deepen the recession significantly.

Government, therefore, should regard banks as social institutions that work not for profit, but for maximizing the welfare of the masses. Such banks will provide stability to the economy and help it realize its full development potential. Commercially organized banks driven by profit motive are a source of instability, inequality and economic disaster.

Commercially organized profit driven financial institutions create an island of immense opulence in the midst of country-wide unemployment and poverty and regularly cause crises, which gravely exacerbate economic woes of the masses.

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