

SBI Monthly review

December 2012

- Economic Growth Through Financing Infrastructure
- Appropriate Methods for measuring Probability of Default (PD) under the Basel II IRB Approach
- Should RBI allow banks to buy back gold
- Macroeconomic Outlook for 2012-13 & 2013-14 based on India - LINK Macroeconometric Model
- Legal Decisions on Banking



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Economic Growth Through Financing Infrastructure

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Managing Director &
Chief Financial Officer
State Bank of India¹

Why is Infrastructure Important

- Raising Agricultural Productivity and Production
- Redeploying Surplus Agri Manpower - Expanding Employment
 - Increasing manufacturing
 - Urbanization

INFRASTRUCTURE

- Improving Social Sector Outcomes (education, healthcare)
- Promoting Financial Inclusion
- Managing Globalization
- Stable, Predictable Macroeconomic Environment
- Good Governance

Where We Stand in Infrastructure

Out of a total of 144 countries:

Russian Federation	-	47
China	-	48
South Africa	-	63
Brazil	-	70
India	-	84 (86 last year)

Source: Global Competitiveness Report 2012-13 of the World Economic Forum

¹*Presentation at the International Conference on "Reviving Growth" (Delhi Economics Conclave 2012) on 15th December 2012 at New Delhi*

Infrastructure Financing - Emerging Countries

Securing sufficient long-term financing

- **Chile and Korea - developed local bond markets; reliance on banking system reduced**
 - Chile: Pension system has been crucial
 - Korea: Foreign and individual investors are important.
- **China and Brazil - bank loans have been instrumental**
 - In China : 30 public banks, and
 - In Brazil : BNDES, the main public development bank have been the major source of finance.

Infrastructure Financing - Enablers

Credit enhancement necessary to motivate investors

- **Chile** - pension funds can invest only in investment grade securities. Private (largely foreign) insurance companies have provided insurance.
- **Korea** - private infrastructure funds operate with extensive backing of public guarantees.
- **China** - options include implicit local government guarantees, bond insurance provided by publicly owned banks

Mobilisation of foreign savings

- **Korea, Brazil** - Large public sector power companies able to issue debt in international credit markets - sovereign rating assumed. Attract foreign investment in publicly guaranteed infrastructure funds (Korea) and in public-private partnerships (Brazil).
- **China** - foreign participation in infrastructure is minimal
- **Chile** - power sector is largely operated by foreign owned multinationals - in road sector PPPs, foreign companies bid along with domestic companies.

Models in select Emerging Markets

Brazil

- Max. long-term Infrastructure financing by publicly-owned BNDES bank
- Discounted spreads - Long-term lending rates often below central bank's overnight lending rate
- Other Banks focus on corporate exposure
- Tax-exempt national Investment Fund

China

- Credit enhancement by public banks or associate companies
- SPV's actively channelize funds from the capital market to infrastructure projects
- Government guarantees for bank loans
- Subsidies to boost profit and credit ratings

Models in select Emerging Markets

Chile

- Well developed equity and corporate bond markets
- Liquid market in interest rate derivatives
- Privatization of Pension System – demand for assets with longer maturities
- Credit enhancement by insurance companies

South Korea

- Increase in private participation through performance-linked rebates and bonuses
- Creation of private equity infrastructure funds
- Availability of equity for green field infrastructure projects
- Exit route - Recycling of equity

Source: "Financing Infrastructure in India: Macroeconomic Lessons and Emerging Market Case Studies" – IMF paper, 2011

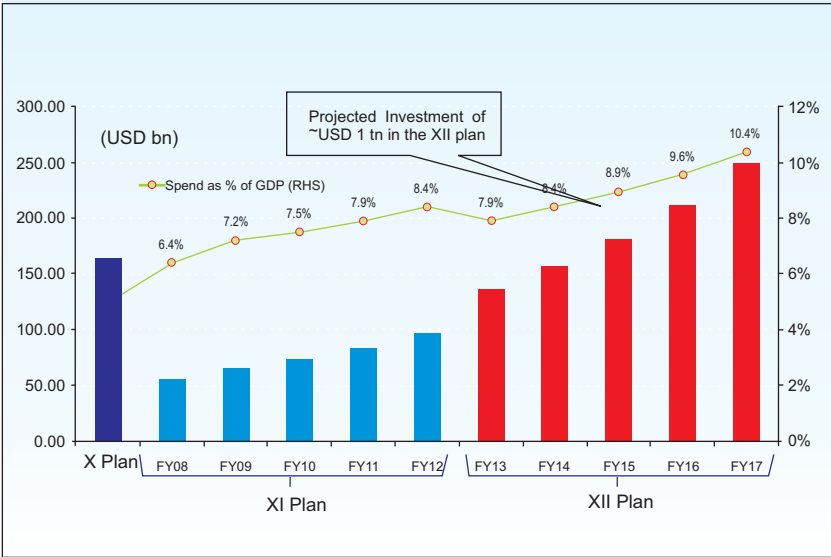
Indian Scenario

- Historically, driven by the State
- Infrastructure spend as %age of GDP and in absolute terms:
 - 10th Plan Rs. 9 lakh cr,
 - 11th Plan Rs. 20 lakh cr,
 - 12th Plan Rs. 50 lakh cr (projected, i.e., about USD 1 trillion) (almost two-fold increase every Plan period)

- India is moving towards a private sector led model:
 - 10th Plan 22% (Rs. 2.02 lakh cr) in
 - 11th Plan 38% (Rs. 7.3 lakh cr) in
 - 12th Plan 47% (Rs. 24 lakh cr, projected) (about a three-fold increase every Plan period)

Source: Planning Commission

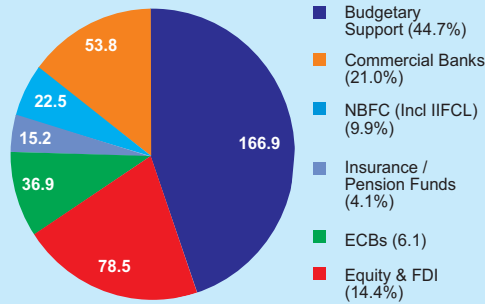
Investment in the Infrastructure Sector in 10th, 11th & 12th Plans



Financing Mix- 11th Plan

XI Plan Infrastructure spend target of \$ 374 bnhas been met but, with significant budgetary support

Total Five years estimated (USD bn)



1 USD = 55.00 INR

Domestic financial sector - banks, NBFCs, FIs, insurance Cos. - has provided almost 35% of the funds

Banking sector exposure has increased more than four-fold from Rs. 1.43 lakh cr as of March, 2007 to Rs. 6.19 lakh cr as of March 2012

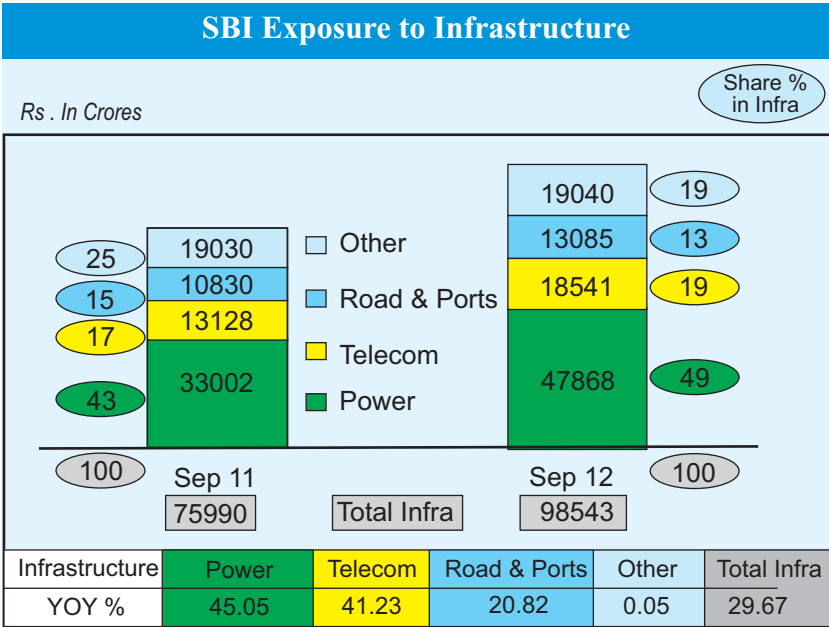
With increased participation expected from pvt. sector in the 12th Plan, debt and equity requirements will multiply almost by 3X.

Major Infrastructure Sectors

Sector	10th Plan	11th Plan	12th Plan
Electricity	68.04	121.5	317.70
Roads & Bridges	25.42	69.7	168.45
Telecom	20.38	64.3	157.58
Railways*	20.42	37.4	101.39
Irrigation	21.34	37.5	78.20
Water Supply & Sanitation	12.02	20.2	40.35
Ports	4.6	6.8	29.41
Airports	1.38	5.6	12.15
Storage	1.12	2.7	8.67
Oil & Gas Pipelines	6.48	9.0	21.85
Total	181.2	374.8	935.7
Investment as % of GDP	5.08	7.55	9.14

Investments mostly by the Govt of India

- Power and Roads sector have received the highest investment. However, physical milestone achievements have lagged.
- Other sectors like ports and railways also require emphasis to facilitate requisite logistic support.
- Significant Rail expenditure to be directed towards development of Dedicated Freight Corridor (DFC); private sector participation would be required.
- Urban infrastructure has not attracted much private sector investment, so far.



PPP : A major framework in selected sectors

Distinguishing Features:

High priority project, Government-planned

- Must have emerged from a Government-led planning and prioritization process
- Must be such that, regardless of the source of public or private capital, the government would still want the project to be implemented quickly

Risk Sharing Framework

- Government assuming responsibility for regulatory, policy, project structuring framework, including land acquisition and clearances
- Private sector to bring in efficiency in project execution and operations
- State not to transfer the entire risk to the private sector, and vice versa
- Financing / investment based on shared risk framework
- Remunerative user charges

Benefit passes on to the end user..

PPP – Story so far..

	Completed Projects		Completed Projects %	
	No. of Projects	Projects Cost (Rs. Cr.)	No. of Projects	Projects Cost (Rs. Cr.)
Roads	196	31,600	45%	28%
Ports	49	36,600	12%	33%
Airports	5	10,850	1%	10%
Railways	5	1,200	1%	1%
Power	14	19,000	3%	17%
Urban Infrastructure	95	8,600	22%	8%
Other Sector	68	3,050	16%	3%
Total	432	1,10,900	100%	100%

The PPP call of Ministry of Finance estimated that as of June 2012, 880 PPP projects are operational in India, with an estimated investment of Rs. 543,045 crores

The Challenge

The main challenges confronting Infrastructure Sector are:

- Finding adequate sources of financing with long tenor
- Removal of impediments to project execution
- Despite an ever growing demand for investment in infrastructure, the investments are seeing a declining trend over the past several quarters.
- Further, the project implementation is frequently delayed with cost over runs.

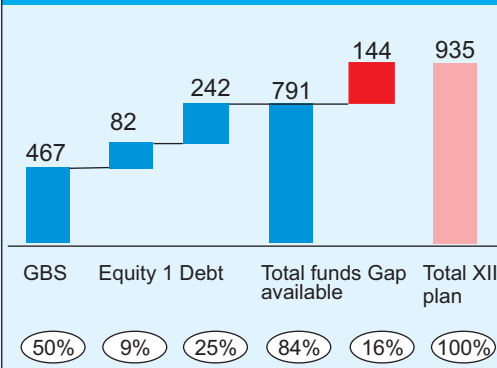
Note: Investments will flow when the risk perception is low

Sources of Financing and Funding Gap

Funds Requirement - XII Plan: -

Funds available seem ~16% short of USD 935 bn target

Funds available versus target for XII plan



Debt will constitute majority of funding gap

- Gross Budgetary Support (GBS) expected to contribute 50% of the total funds required for the XII plan
- For the remaining 50% of non GBS, availability of Debt and Equity is estimated at 25% and 9% respectively
- Funding gap of USD 144 bn should be bridged primarily through alternate financing

Funding through equity is also significantly large

1 USD = 55.00 INR

These figures may undergo some change if there are positive changes in the policy for mobilizing additional funds for infrastructure financing

SOURCE: Planning commission, RBI, IRDA, others

Finding Adequate Sources of Financing

- Banks have been one of the major sources of debt financing for infrastructure projects, so far
- However, going forward, banks will not be able to maintain same pace because of
 - Sheer magnitude of funding requirement (~ \$80 billion)
 - Asset Liability mismatch (tenor)
 - Exposure risk (sector, as well as individual ticket)
 - Rising level of restructured standard assets - stress on the domestic banks' balance sheet
 - Heightened risk perception of infrastructure projects
- Given the heightened risk perception, raising equity or attracting international investment may also be difficult in the current scenario (~ \$54 billion).
- Raising equity will be an equally crucial challenge

Finding Adequate Sources of Financing-Suggested Measures

Vibrant Bond Market

Country	Sector-wise			Total
	Govt.	FL's	Corporate	
China	1,500.80 (49%)	974.60 (32%)	572.20 (19%)	3,047.60
France	1,834.00 (54%)	1,300.60 (38%)	286.90 (8%)	3,421.50
Germany	1,817.70 (65%)	593.60 (21%)	403.30 (14%)	2,814.60
India	610.40 (86%)	75.50 (11%)	25.10 (4%)	711.00
Japan	11,579.90 (85%)	1,127.50 (8%)	867.70 (6%)	13,575.10
Singapore	105.50 (81%)	23.20 (18%)	2.00 (2%)	130.70
South Korea	512.80 (44%)	257.70 (22%)	404.60 (34%)	1175.10
UK	1,394.80 (81%)	311.60 (18%)	20.70 (1%)	1,727.10
USA	111,403.40 (45%)	11,134.70 (44%)	2,937.20 (12%)	25,475.30

- *SOURCE : DIPP – Discussion paper on financing requirements of infrastructure and industry*
- Indian Bond market is very shallow as compared to other countries – traditionally being a bank dominated financing system
- Most of the Bond issuance is done by Govt of India
- Countries like China, France, USA, South Korea, etc. have a vibrant bond market where FI's raise capital

Finding Sources of Financing - Suggested Measures

- Deepening and Broadening the Bond Market
 - Credit Enhancement for corporate bonds
 - Credit Default Swaps
 - Market-making
- Attracting long term funds (Insurance, Pension/Provident Funds)
- Addressing ALM problems of banks
 - Take out financing
 - Infrastructure Debt Funds
 - Securitisation of Debt, aimed at retail investors
 - Fiscal benefits, CRR/SLR exemption for Infrastructure Bonds
- Managing Lender Risk of Banks
 - Interest Rate derivatives / Long-term Forex hedging
 - Introduction of common reference rate for setting lending rates
 - strengthening credit discipline in multiple lending
- Urban Infrastructure – Developing Municipal Bond market

Removal of Impediments to Project Execution - 1

- **Major Hindrances**
 - Delays in Land Acquisition
 - Obtaining regulatory consents and approvals
 - Supply and Off take constraints (e.g., coal in the power sector, and financial health issues of discoms)
 - Deficiencies in logistics (e.g., ports and rail)

Removal of Impediments to Project Execution - 2

- **Suggested Measures**
 - Addressing the above constraints
 - Supportive regulatory and policy frameworks
 - Structured review process to address issues that crop up during project execution/ implementation and operations
 - Simplifying procedures; single-window clearance
 - In PPP projects, ensuring that all the necessary approvals/ clearances are bundled with the award of the projects, as also significant part of land
 - Evolving ground rules to ensure long term financial health of the projects / sector, and not pursue short term profit maximization by exploiting the competitive bidding process (e.g., NHAI bidding).

Recent Initiatives of the Government

- Setting up of National Investment Board (NIB)
- Regular monitoring and review of large value projects (>1,000 crore)
- Forming consortium of major Banks/ FIs for financing large value projects- one stop window

Bottom line

Quick remedial measures on the structural, regulatory and policy side are essential to shore up the negative sentiment and heightened risk perception associated with the infrastructure sector. Financing – both, debt as well as equity - can take place only with mitigation of these risks. Private developers/ investors/ lenders cannot handle these risks by themselves.

Appropriate Methods for measuring Probability of Default (PD) under the Basel II IRB Approach



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Introduction: Correct estimation of default probabilities are becoming an increasingly important element of bank's measurement and management of credit exposures under more sophisticated Basel II IRB Approach which is going to be adopted by Banks by 2014. Wrong estimates of Probability of Default (PD) could also lead to inappropriate capital allocation and as a consequence, destroy shareholder value due to default.

Finding quantitative methods for estimating Default Probability is a first step towards Basel II IRB. Default is not an abrupt process. A firm's credit worthiness and asset quality declines gradually => credit migration. Transition Probability is the chance of credit quality of a firm improving or worsening. When credit quality worsens, the probability of future default also increases.

Default is an extreme event of credit migration

- There are broadly two data sources used to compute obligor PD:
 - Internal data and model/ internal ratings
 - External reference data/ external ratings
- Banks will likely use a bit of both:
 - For middle market & small business, no public ratings, so internal ratings only
 - For large corporate & large middle market, public ratings available for bench marking / calibration of internal ratings.

Task for Computing PDs

Step1: Rate the obligor using one of the following:

- Expert judgment with given criteria
- Score from a quantitative model
- PD from a quantitative model directly estimating PD

Step2 : Bucket the obligor into one of seven or more grades

Step3 : Estimate PD for each bucket using one of the following:

- External historical loss data such as rating agencies
- Internal historical loss data for obligors in each bucket
- Average modeled PDs for obligors in each bucket

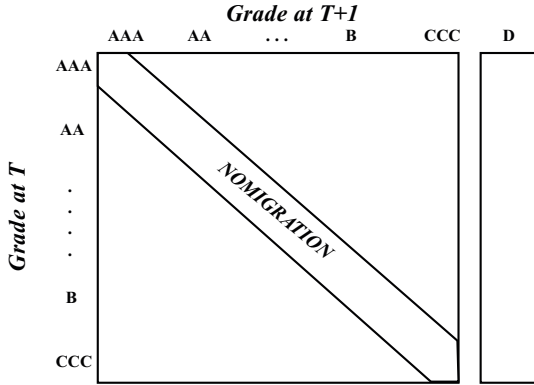
Method for Estimation of PD through Transition Matrix

The Transition Matrix provides the profile of credit quality changes or migrations that have taken place for the selected credit portfolio between any two years that are selected. The Transition Matrix is a summary of how all the rated borrower accounts in the user's credit portfolio have migrated (within various standard account categories as well as to default or NPA category) between the selected two years. Rating agencies (Standard & Poor, Moody's, Fitch internationally, in India, CRISIL) provide worldwide valid transition matrices, which can be taken as a benchmark but cannot be directly applied to measure portfolio risk of a Bank.

The transition matrix can be constructed by a Bank using its own rating history data in excel using “pivot table”. For the Transition Matrix to be generated, at least two years rating data should be available in the Model. If ratings have been generated for borrower accounts for only one year, the Transition Matrix will not be generated and the appropriate message will be displayed when the user tries to process this report. The rating data need to be ordered properly to incorporate regional and industry information which will enable the management to compare slippage statistics across various regions and industries.

The diagonal portion of the above Migration matrix is capturing the cells where no rating migrations take place. These are also the number of accounts gets counted for each rating grade where rating retention is taking place. Any movement to the right side of the diagonal for each grade captures the rating slippage. Any movement to the left hand side from the diagonal position captures the rating up-gradation. The last column of the transition matrix represents probabilities of default.

Chart 1: Transition Matrix Approach of Computing PDs



If we repeat construction of these cohorts for many periods, we will be able to compute the historical rating based annual probability of default (PD) for each grade. Here we are mainly talking about discrete transition matrices. The traditional transition matrices provided by rating agencies are in discrete time, typically with a 1-year horizon. Information at only two dates for each year of data is necessary to calculate such a transition matrix.

As a first step, we start by doing mortality rate analysis of yearly cohorts of companies for at least 2 years to find the number of firms in each rating class in each cohort moving towards default category (D). Each cohort comprises of all the companies which have a rating outstanding at the start of the cohort year. From these cohorts, we calculate year-wise default probabilities for different rating grades and for different industries. Say there are $T_{i,D}$ number of firms migrating to Default category out of N_i number of firms in the i^{th} rating grade (or industry) over a one-year period, where the subscript i represents the rating grade (or industry) at the start of the period and the subscript D represents Default. The one-year probability (PD) of the i^{th} rating grade (or industry) is estimated by counting the frequencies : $\frac{T_{i,D}}{N_i}$. The average one-year default probability for the i^{th} rating grade or industry (PD_i) is obtained by weighted average, where the weights are the number of firms in the i^{th} rating class (or industry) in a particular year divided by the total number of firms in all the years.

$$PD_i = \mathring{\mathbf{a}} \sum_{t-1}^n W_i^t \frac{T'_{i,D}}{N_i^t}$$

where $\mathring{\mathbf{a}}$ is the weight representing the relative importance of a given year

$$W_i = \frac{N_i'}{\sum_{s=1}^n N_i^s}$$

This method can be easily understood if we do some numerical exercises. This has been shown below.

The following table reports the number of defaults & number of accounts in AA and BBB grades as well as accounts with missing/withdrawal grades in respective years. These numbers have been obtained through the study of historical rating cohorts of these grades (using pivot table).

Table 1: Historical Rating-wise Default Statistics

	2007-08	2008-09	2009-10	2010-11	2011-12
AA:					
No. of Defaults	3	7	4	2	8
No. of Accounts#	300	250	200	220	300
# Missing/Withdrawal	30	20	15	10	15
BBB:					
No. of Defaults	15	20	10	15	40
No. of Accounts#	500	550	580	600	650
# Missing/Withdrawal	10	20	10	15	20

The five year PD for AA: $\frac{3+7+4+2+8}{300-30+250-20+200-15+220-10+300-15}$
 => PDAA=1.98%

Similarly, five year PD for BBB: $\frac{15+20+10+15+40}{500-10+550-20+580-10+600-15+650-20}$
 => PDBBB=3.57%

See Table 1 for reference.

In Table 2, we present a one-year average transition matrix for the entire sample period (1995-96 to 2004-05) using CRISIL’s corporate bond rating data history of 572 companies in India. We find that as the credit quality worsens (i.e. rating grades decline) the default probability (PD) increases. One can see from said table that PD jumps sharply from 5.17% for BBB to 28.93% for BB. This justifies our classification of bonds in BB grade and below as Non-Investment Grade (NIG) and AAA to BBB grades as Investment Grade (IG). We also find that the rating stability declines as the credit quality worsens.

Interestingly, Table 2 transition matrix is markedly different from Standard and Poor's global transition matrix (reported in Table 3) especially for non-investment grades (NIG) companies. One can compare that our below BBB firms are as risky as S&P global CCC firms.

Table 2: Indian Corporate Transition Matrix

Table: One Year Average Rating Transition Matrix for the Period 1992-2009 in %

		Year T+1							
		AAA	AA	A	BBB	BB	B	CCC	D
Year T	AAA	96.05%	3.95%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	AA	2.81%	89.74%	6.20%	0.68%	0.39%	0.10%	0.00%	0.10%
	A	0.00%	3.99%	83.71%	7.12%	2.70%	0.32%	0.54%	1.62%
	BBB	0.00%	0.51%	5.09%	75.83%	10.69%	1.53%	2.80%	3.56%
	BB	0.00%	0.70%	0.00%	1.41%	59.86%	3.52%	7.75%	26.76%
	B	0.00%	0.00%	0.00%	7.41%	0.00%	40.74%	22.22%	29.63%
	CCC	0.00%	0.00%	0.00%	2.13%	0.00%	0.00%	53.19%	44.68%

Table 3: Global Corporate Transition Matrix

	AAA	AA	A	BBB	BB	B	CCC	D
AAA	92.36	6.71	0.74	0.13	0.06	0.01	0.00	0.0003
AA	0.63	91.14	7.52	0.57	0.08	0.05	0.01	0.0039
A	0.06	1.89	91.83	5.62	0.44	0.14	0.01	0.0086
BBB	0.03	0.22	3.92	89.79	5.05	0.14	0.08	0.0998
BB	0.03	0.09	0.50	4.83	84.06	9.05	0.80	0.6394
B	0.00	0.07	0.23	0.46	4.52	83.39	6.29	5.0225
CCC	0.05	0.01	0.29	0.42	1.16	8.41	44.19	45.460

Source: S&P

If a national bank institution intends to rate the credit standing of counterpart within own rating system a procedure for synthetic transition matrix generation is needed. Besides estimating probability of default for Basel II Internal Rating Based Approach (IRB) for individual corporate loans, it can also be used as an effective loan monitoring tool. It can be used across zones/industry/branches to track slippage rates. The central office as well as zonal offices can monitor the movement of various loans and study the slippage statistics for the entire portfolio.

Cumulative Probability of Default (CPD)

The cumulative probability of default gives idea about a borrower's chance of default over a longer time horizon (of say five years). This can be obtained from the analysis of survival rates for various grades through yearly mortality analysis over a longer time horizon (e.g. 3/5/10 years).

In order to estimate CPD, we have to assume conditional independence amongst each yearly cohort of rating movements. Following expression may be used to estimate a five year CPD of a grade i :

$$CPD_n^i = 1 - S_n$$

S_n : survival rate at the end of year "n"

$$S_n = (1 - pd_1) \times (1 - pd_2) \times (1 - pd_3) \times (1 - pd_4) \times (1 - pd_5)$$

$$\therefore CPD_i = 1 - \{(1 - pd_1) \times (1 - pd_2) \times (1 - pd_3) \times (1 - pd_4) \times (1 - pd_5)\}$$

The survival rate up to "n" years is as thus:

$$(1 - cn) = (1 - cn-1) \times (1 - dn)$$

Where

cn = cumulative probability of default (CPD_n) in n th year; & $dn = pd$ (probability of default in n th year).

$cn-1$ = cumulative probability of default in $n-1$ th year

Using the above expression, one can convert cumulative pd into probability of default in a particular year.

Now using the default numbers reported in Table 4, we can obtain yearly PDs (or call marginal pds) as well as cumulative PDs (CPDs).

Table 4: Historical Rating-wise Default Statistics

	2007-08	2008-09	2009-10	2010-11	2011-12
AA:					
No. of Defaults	3	7	4	2	8
No. of Accounts#	300	250	200	220	300
# Missing/Withdrawal	30	20	15	10	15
Yearly PDs (pd)	1.05%	2.92%	2.16%	0.95%	2.76%
BBB:					
No. of Defaults	15	20	10	15	40
No. of Accounts#	500	550	580	600	650
# Missing/Withdrawal	10	20	10	15	20
Yearly PDs (pd)	3.06%	3.77%	1.75%	2.56%	6.35%

Using the yearly pd figures, we can now estimate five year cumulative PD for AA:

$$\begin{aligned} \text{CPD5AA} &= 1 - \{(1 - 1.05\%) \times (1 - 2.92\%) \times (1 - 2.16\%) \times (1 - 0.95\%) \times (1 - 2.76\%)\} \\ &= 9.48\% \end{aligned}$$

This gives an estimate of cumulative probability of default for AA borrowers at the end of fifth year.

Similarly, 3 year cumulative PD for BBB would be:

$$\begin{aligned} \text{CPD3}^{\text{BBB}} &= 1 - \{(1 - 3.06\%) \times (1 - 3.77\%) \times (1.75\%)\} \\ &= 8.36\% \end{aligned}$$

This gives an estimate of cumulative probability of default for AA borrowers at the end of third year.

Similarly, five year CPD for BBB would be=16.38%

Cumulative probability of default has uses in pricing long term loans and in studying the risk behaviour of various grades over different maturity horizon.

Pooled PD for Homogenous Buckets of Retail Exposures (Tracking the numbers)

Under the IRB approach a bank will be expected to assign a pooled PD to each of its risk buckets. These pooled PDs should reflect the central tendency (the mean or the median) of the PDs of the individual obligors contained in each bucket. In practice, of course, IRB banks will need to estimate pooled PDs from available data. Bank supervisors and risk managers will be tasked with evaluating PD quantification methodologies to ensure that those methodologies produce accurate estimates of pooled PDs. The revised framework outlines three broad approaches to quantifying pooled PDs. Banks may use any one approach for estimating pooled PDs.

Under a historical default experience approach, the pooled PD for a risk bucket is estimated using historical data on the frequency of observed defaults among obligors assigned to that bucket.

The following section describes pooled PD approach which may be adopted by Banks.

The Pooled PD Approach:

The historical default experience approach is most appropriate for quantifying pooled PDs for point in time retail buckets. It will be most accurate when long-run average default rates are calculated over a number of years. A Bank may either follow frequency based measure or rupee weighted exposure based measure to compute pooled PD.

Frequency based Measure:

The probability of default (PD) for a retail pool/bucket is defined as the observed default rate for the bucket over a fixed assessment horizon (usually one year). That is:

$$PD_t = D_t / N_t$$

Where D_t is the number of defaults observed for a bucket over year t and N_t is the total number of obligors assigned to that bucket at the beginning of year t . The pooled PD for a risk bucket can be interpreted as an ex-ante forecast (which is also called as expected default frequency or EDF) of the one-year-ahead ex-post observed default frequency for that bucket. However, because default events are generally correlated across obligors it is unlikely that in any given year a bucket's pooled PD (actually observed) will closely match its observed default frequency. Here we are trying to find out long run PD from the observed default frequencies. During the years when aggregate economic conditions unexpectedly improve the observed default frequency for a risk bucket will tend to fall below its dynamic pooled PD. During the years when economic conditions unexpectedly deteriorate observed default frequencies will tend to lie above forecasts. In such a situation, the Long-Run Average Default Probability (LRPD) is considered as a close proxy of the pooled PD for the retail bucket.

The long-run default frequency (LRPD) for a risk bucket is simply the average of that bucket's annual default rates taken over a number of years. In symbols:

$$LRPD = \bar{a} \quad PD_t$$

$$t=1$$

Where T =total number of years in the data history

Over time, year-to-year differences between unstressed pooled PDs and observed default frequencies should tend to cancel out, and the LRPD for a retail bucket can be expected to converge toward the long-run average pooled PD for that bucket. This implies that given a sufficiently long history of performance data, the historical default experience

approach can provide an effective means of quantifying pooled PDs that reflect obligor PDs for the retail bucket.

Table 5 demonstrates the data requirements and methodology for estimation of pooled PDs for retail buckets.

Table 5: Estimation of frequency based pooled PD for homogeneous retail buckets (Personal Loans) - Illustration 1

					Units in Number		
Year	2006	2007	2008	2009	2010	2011	2012
Total no. of accounts Outstanding	8000	10000	12000	15000	18000	20000	22000
No. of accounts defaulted out of the no. of accounts Outstanding in the previous year		300.0	450.0	500.0	450.0	500.0	520.0
Yearly Default Probability (PDt)		3.33%	4.50%	4.05%	3.00%	2.83%	2.60%
LRPD=pooled PD							3.40%

Note: LRPD is the five year average of PDt

The Bank may compare Jan 2006 with Jan 2007 or may follow financial year March 2006-March 2007 for tracking default numbers and no. of accounts outstanding.

The bank should make adjustments every next year because portfolio will change. For example, exclude those accounts outstanding in 2006 maturing in 2007), exclude those accounts of 2006 which have defaulted in 2006. Include those accounts of year 2006 which have not matured or defaulted and may still be outstanding in year 2007. This may be repeated for other years as well. Include the new accounts which have been sanctioned in 2006. A Bank can also track NPA exposure (in Rs. Amount) movements (ratio of GNPA additions to 3 year average gross advances) if no. data is missing. However, one should use a more conservative method.

Exposure based Rupee weighted pooled PD:

We also outline below another proxy method for estimating historically derived pooled PDs for retail portfolios in case number of accounts data is not available. This is called exposure based method for computing pooled PD. In this method, PD can be estimated for the entire pool from its yearly (or quarterly) movements of gross non-performing assets (GNPA).

One should first estimate yearly (or quarterly) marginal PDs by using a moving average method as shown in the equation.

$$MPD_t = \frac{1}{3} \overset{\circ}{\mathbf{a}}_{t=1} (DGNPA_t / Advances_t)$$

$$PD = \overset{\circ}{\mathbf{a}}_{t=1}^3 \frac{MPD_t}{T}$$

Where T is the total number of periods. Some case we have taken 5 years average and some cases 10 years average) depending upon the data availability.

In this method, the bank's credit analyst will have track the yearly additions of gross NPA amounts (denoted by $DGNPA_t$) and divide it by the 3 years average gross advances and estimate marginal PDs. Repeating the same exercise the for other years, one can finally the long run average PD by taking five or ten year weighted average of yearly marginal PDs (i.e. MPDs). This gives us an estimate of rupee weighted average long run PDs for the entire retail pool. Table 6 defines the data requirements and methodology for estimation of pooled PDs for retail buckets using the proxy approach.

Table 6: Estimation of Long-Run Average Pooled Probability of Default for Homogeneous Retail Pool (Personal Loan) - Illustration 2 (Exposure based Method)

Year	2006	2007	2008	2009	2010	2011	2012
Gross Advances	313	280	320	480	550	620	729
Incremental GNPA		13.0	12.0	18.0	17.0	18.0	24.0
MPD		4.39%	3.95%	5.00%	3.78%	3.27%	3.79%
LRPD=pooled PD							3.96%

Note:LRPD is the long run PD which is the average of 5 yearly MPDs

A minimum of 5 years of data is required to arrive at a long-run average pooled probability of default. However, the longer the time series taken, the better will be the statistical reliability of the pooled PD estimate.

The bank may have to compare both the methods and must choose the most conservative estimate of pooled PD for the risk weight calculation.

A bank may also follow other methods for computing retail PDs:

Under a statistical model approach, predictive statistical models are used to estimate a PD for each obligor currently assigned to a bucket. The

bucket's pooled PD is then calculated as the average of the obligor specific PDs.

Under an external mapping approach, a mapping is established that links each of a bank's internal risk buckets to external rating grades. Pooled default probabilities for the external grades are calculated from external data and then assigned to the bank's internal grades via the mapping.

Summary and Conclusions

This article discusses various techniques for estimating probability of default of a borrower which is the first element of measuring credit risk of a loan or a pool of loans. Each of these approaches has important strengths and weaknesses that depend on the dynamic characteristics of the PDs being estimated.

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Should RBI allow banks to buy back gold

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The investment in gold bars and coins is rising faster than in jewellery. Allowing banks to buy back gold will help financialisation of savings and increase the domestic savings rate

Indians have always had a yearning for gold and, according to the World Gold Council, India is the largest consumer of gold, accounting for over a quarter of the annual global production. After oil, gold is the second largest item of imports. Gold imports equal 75 per cent of India's current account deficit (CAD) and the sharp increase in gold imports to \$57 billion in FY12 from \$41 billion in FY11 is a major factor behind the widening gap on the balance of payments account.

Rising gold imports to meet domestic demand has seen a doubling in gold imports between FY09 and FY12. The demand for gold has not only remained high – as reflected in the rising volume of imports – but the demand is also set to go up for several reasons. One, in the current inflationary scenario, gold is seen as a hedge against inflation. Interestingly, the sharp spike in gold imports in FY11 and FY12 was against the backdrop of high average inflation of 9.6 per cent in FY11 and nine per cent in FY12. Second, alternative assets like equity and debt have become unattractive with slowing Gross Domestic Product (GDP) growth. The global uncertainty has also seen gold gain against hard currencies. Third, there are limited avenues available to savers particularly in rural and semi-urban areas. So, gold has usually been held to meet unexpected exigencies. Finally, and more importantly, gold has a huge social value as it is traditionally purchased for marriages, social customs, and so on.

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Households contribute 80 per cent of the demand and an estimated 25,000 tonnes of bullion is held by Indian households. By some estimates, gold savings will be around Rs 3,50,000 crore by 2016 from Rs 2,44,000 crore in 2012.

From the consumer's point of view, gold is seen as a highly liquid asset and, even though it does not earn any return, it protects the saver's wealth, given the persistent and sharp rise in gold prices. However, savings in gold remain idle and not available for productive investment. Recent measures to curb the demand for gold, including doubling of import duty on gold imports, and cut in loan limits of non-banking financial companies to 60 per cent of metal value, have not had much impact.

To meet the retail demand for quality gold, banks have been allowed to sell gold coins. However, the Reserve Bank of India (RBI) has refused to allow banks to buy back the gold that they have sold. In my view, it is now time to reconsider this decision for several reasons.

First, the investment in gold bars and coins is rising faster than in jewellery. Therefore, allowing banks to buy back gold will help financialisation of savings, increase the domestic savings rate, deepen household savings in financial assets and help intermediate savings into productive investment. This would have a huge positive impact on growth and would be very beneficial for the economy.

Second, with banks buying back the gold sold by them, it will increase the supply and turnover of gold in the market. There would of course be no loss in quality and banks can be allowed to hedge in the domestic market to protect them against any fluctuations in price. As more gold comes out into the market, it will reduce the demand for gold imports and thus curtail CAD. In fact, if gold imports are eliminated, CAD can become less than one per cent of GDP.

The issue has assumed added urgency given the fact that we need to raise resources for investment in infrastructure to support and sustain eight to 10 per cent of GDP growth. There is an urgent need to not only step up the pace and volume of household savings (which is now seen shrinking), but channel household savings increasingly into financial assets.

Since India is one of the fastest growing countries, in the future as incomes rise, consumption of gold will also go up. Empirical evidence shows that as incomes increase, there is a propensity to buy more gold. In fact, for every one per cent increase in income, gold consumption increases by 1.554 per cent, showing that gold consumption is highly income elastic. Since around 40 per cent of the gold is held in bars and coins – even if we are able to convert this gold held in physical assets into financial assets and deploy these for productive purposes – GDP growth of nine to 10 per cent will become a reality. Therefore, RBI should now allow banks to buy back gold.

Macroeconomic Outlook for 2012-13 & 2013-14 based on India - LINK Macroeconometric Model³

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The GDP growth forecasts for 2012-13, based on the INDIA LINK model, have been revised downwards to 5.9% from 7.4% predicted in February 2012. This pessimistic growth outlook is lower than that during the global crisis in 2008 and can be explained by the prevailing domestic economic uncertainties coupled with worsening of globaleconomic prospects. Since early 2012, the external environment has gone from bad to worse resulting in holding up investments as well as appreciating risks. These trends clearly indicate that reaching the pre-crisis growth rate may take much longer than expected. This has also been reiterated by IMF in its recent World Economic Outlook. It now seems that with the weak global demand the Indian economy may be hovering around the 'new normal' growth of around 6 to 7% in the medium to long term.

The key forecasts are given below:

Key Economic Indicators 2008-09 to 2013-2014 (All in growth rates)

Year	2008-09	2009-10	2010-11	2011-12	2012-13 (F)	2013-14 (F)
Agriculture	0.1	1.0	7.3	2.8	0.1	2.8
Industry	4.0	8.9	6.8	2.6	4.8	7.3
Services	9.4	10.0	9.2	8.5	7.9	7.8
Real GDP	6.7	8.4	8.4	6.5	5.9	7.1
WPI	8.1	3.8	9.6	8.9	7.2	6.6
Exports	3.4	-4.7	20.6	24.9	6.6	8.9
Imports	14.4	-8.2	26.6	32.2	8.2	10.2

#: Industry includes Manufacturing, Mining & Quarrying, Electricity, Gas & Water supply.

F: Forecasts from the quarterly INDIA LINK macroeconometric model.

The forecasts are based on the following assumptions for the year 2012-13 for certain exogenous variables. The interest rate cycle is expected to move downwards from the last quarter of 2012-13. Global consumer price inflation and food inflation are expected to remain high following a decline in food production (as per FAO's recent report) due to a bad monsoon. Advanced country output is projected to grow as per OECD projections (which is revised downwards due to recessionary conditions in many of the EU nations as well as in UK). A modest recovery is expected in foreign investment inflows (especially FII inflows) in 2012-13 as a result of some important reforms initiatives.

One of the crucial factors that resulted in the downward revision of the GDP growth forecast is the high and unsustainable fiscal deficit, which appears to be crowding-out private investments. In the Union Budget for 2012-13, the government aimed to reduce the deficit to 5.1% from 5.8%, largely through a reduction in the subsidy bill as well as through higher disinvestment proceeds. It has also reworked the new Medium Term Fiscal Plan. After passing of over half of the current fiscal year, one would only doubt whether this fiscal target is achievable. The recent Kelkar Committee report highlights that the economy is on the edge of 'fiscal precipice' and notes that without any fiscal reform, the deficit could jump to 6.1%. Reducing from this level to the revised target of 5.3% requires reforms both on the revenue as well as on the expenditure (including subsidy) side. There were some bold measures in terms of a partial hike in the prices of diesel and LPG and to some extent in the prices of fertilizers. On the revenue side (in particular on disinvestment), some proposals are cleared, although mobilization depends largely on the market conditions, which is weak at the moment.

Another negative risk is the worsening of the current account deficit along with falling foreign capital inflows that pose substantial downside risks to overall investment sentiment. A sharp fall in exports and a rise in gold imports have worsened overall external balances. However, the recent policy changes in FDI and a decline in demand for imports might help in narrowing the deficit to some extent. Nevertheless, as exports are dwindling, the year would still end up with a CAD of 3.4%, which is a cause for concern.

On the inflation front, while there was some moderation in early 2012-13, recent trends show that inflation is still above the comfortable level. This is largely due to the increase in the prices of administered commodities such as food and fuel as part of a subsidy reduction strategy. In addition to this, the untimely monsoon appears to have firmed up food

inflation expectations further. However, the core inflation (non-food manufacturing) showing a definite signs of declining. While this may mean that the downward movement in interest rate cycle might be delayed, it could however put less pressure on the liquidity. Overall, we forecast inflation to be around 7.2%. But there are down siderisks from the weak Rupee/US dollar exchange rate, which might pose some further risks through imported inflation, as well as from the second round effects of domestic fuel price hikes.

With the weak exchange rate, theoretically one would have expected higher exports in the recent period. On the contrary, India has been experiencing negative exports(merchandise) growth for the past six months. As the external demand conditions are subdued, our model predicts exports growth of 6.6% in 2012-13 compared to 25% in the previous year. Similarly, as growth, actual and expected, as well as the exchange rate are the main drivers of import demand, given the depreciation in the exchange rate and low growth prospects, growth in imports is likely to decline to 8.2%. On the exchange rate front, the first half of the year has seen a substantial depreciation to over Rs. 55/USD. This is despite a higher interest rate differential in favour of the Rupee. In our view, such a sharp depreciation was largely due to the outflow of short-term capital as well as some FDI outflows. The intermittent appreciation of the exchange rate following clearing of FDI proposals was short lived as these proposals were clearly not sufficient enough to improve the growth sentiments. Recent stable rating by Moody's as well as clearing of Banking Laws (Amendment) and Companies Bill might help the Rupee to recover to some extent. Overall, we expect the exchange rate to rally around 54 by the end of the year.

On the supply side, following a delayed monsoon, agriculture output (particularly kharifout put) is expected to see a significant fall. Assuming that growth in the rabi crop is robust, the overall agricultural output growth is expected to be flat. On the industrial front, demand conditions (both domestic and external) as well as negative investment sentiment appear to pull down growth prospects. However, with the recent fiscal measures, one can expect some positive trends in credit availability as well as credit off take. In addition to this, governance issues in important sub-sectors such as coal, power and telecom may delay the recovery in the industrial sector. If the recent Cabinet decisions such as FDI norms and Land Acquisition bill are passed through the legislation, then one can expect revival of investment in the industrial sector. Further, assuming that the interest rate cycle will move downwards from the last quarter, industrial growth is expected to increase marginally to 4.8%.

However, services sector growth may witness its lowest growth for over a decade as it depends heavily on external demand as well as on the public administration. Since both these indicators are expected to decline in the current year, overall services growth for 2012-13 is expected to decline to 7.9%.

Thus, based on the recent developments in both the domestic and international markets, GDP growth in 2012-13 is expected to fall to 5.9%. Note that for the first half of 2012-13, GDP growth is estimated at 5.3% against 7.3% in the same period last year. As the external conditions are not conducive to higher growth, in the medium-term there is a need for a shift from export-led strategy to domestically driven growth with more reforms that reduce supply bottlenecks. The recent policy of relaxing FDI limits for Retail and Civil Aviation, passing of Banking and Companies Bill, and Cabinet clearance for some of the other pending reforms such as Land Acquisition Bill and FDI in the insurance sector, are in that direction and would have medium to long-term impact on output.

Going forward, our model predicts a recovery in growth in 2013-14 to 7.1% and this growth recovery is expected to be driven by the recovery in the industrial output while we expect a continuation of subdued growth on the external front. Although this is still lower than the pre-crisis period growth, it could be close to a 'new normal' growth for India. While agriculture is expected to show some moderate recovery, services growth is expected to decline for the second consecutive year, largely due to lack of demand from the external front as well as due to expected decline in the growth of public administration. To sum up, the recent developments in the government policy, with expected monetary easing in the last quarter, clearly provides the requisite confidence both to the domestic and foreign investors. With this, one can only expect recovery in the growth path from now on.

Legal Decisions on Banking

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Hon'ble Supreme Court Judgment **United Bank of India VS Naresh Kumar** **Reported as AIR 1997 SC 3**

Issue Involved:

Whether suits instituted or defended on behalf of public corporation like bank should be permitted to be defeated on a mere technicality that the same has not been signed by a competent person.

Brief Facts of the Case:

United Bank of India (Appellant) had instituted a suit in the Court of Sub-ordinate Judge, AmbalaCantt. for recovery of Rs. 1,40,553.91 from the respondent. The case of the appellant was that on 12th April, 1984 a sum of Rs. 50,000 was advanced as loan to respondent No. 1 for the purposes of his business and on that date he had executed a demand promissory note, hypothecation of goods agreement and other documents. Respondent No. 2 and one Sh. Suresh Kumar, husband of respondent No. 3 had stood as guarantors for the repayment of the loan. The respondents were stated to have agreed to pay interest at the rate of 18 per cent per annum with quarterly rests. When default in payment of the money was committed the aforesaid suit was filed for the recovery of the principal amount and the interest thereon. The sum total came to Rs. 1,40,553.91.

In the written statement filed by respondent No. 1 the plea which was taken was that he had never taken loan as alleged by the appellant bank and respondent No. 2 and Sh. Suresh Kumar had not executed any guarantee deed. It was, however, admitted that certain blank documents had been got signed but it was denied that the respondents had agreed to

pay interest at the rate of 18 per cent per annum. **He also took an additional plea challenging the authority of Sh. L.K. Rohatgi to sign and file the plaint on behalf of the appellant.**

The trial judge by his judgment dated 14th November, 1987 held that the suit had not been signed by a competent person, though the trial court held that respondent No. 2 was liable to pay only a sum of Rs. 55,699.20 as the principal amount plus interest at the rate of 18 per cent per annum for the period 12th April, 1984 to 11th February, 1985. In view, however, of the decision against the appellant of issue that suit was not filed by a competent person, the suit filed by the appellant was dismissed with costs.

The appellant then filed an appeal which was decided on 2nd November, 1992 by the Additional District Judge, Ambala. The Additional District Judge reversed certain findings of the trial court, however, the appeal was dismissed because the Additional District Judge upheld the decision of the trial court with regard to issue regarding competency of person to sign the suit. It was held that it has not been proved that Sh. L.K. Rohatgi had held any valid authority to file the suit on behalf of the appellant bank.

Against the aforesaid decision of the Additional District Judge the appellant filed a regular second appeal. By order dated 30th August, 1993 a single judge of the Punjab and Haryana High Court dismissed the said appeal in limine by observing that there was no ground for interference with the concurrent findings of facts recorded by two courts below.

In this backdrop, the United Bank of India approached the Hon'ble Supreme Court. The issue before the Hon'ble Supreme Court was **“Whether the plaint was duly signed and verified by a competent person.**

Decision of the Court:

The Hon'ble Supreme Court while deciding the matter held as under:

In cases like the present where suits are instituted or defended on behalf of a public corporation, public interest should not be permitted to be defeated on a mere technicality. Procedural defects which do not go to the root of the matter should not be permitted to defeat a just cause. There is sufficient power in the Courts, under the CPC, to ensure that injustice is not done to any party who has a just case as far as possible a substantive right should not be allowed to be defeated on account of a procedural irregularity which is curable.

It cannot be disputed that a company like the appellant can sue and be sued in its own name. Under Order 6 Rule 14 of the CPC a pleading is required to be signed by the party and its pleader, if any. As a company is a juristic entity it is obvious that some person has to sign the pleadings on behalf of the company. Order 29 Rule 1 of the CPC, therefore, provides that in a suit by or against a corporation the secretary or any Director or other Principal Officer of the corporation who is able to depose to the facts of the case might sign and verify on behalf of the company. Reading Order 6 Rule 14 together with Order 29 Rule 1 of the CPC it would appear that even in the absence of any formal letter of authority or power of attorney having been executed, a person referred to in Rule 1 of Order 29 can, by virtue of the office which he holds, sign and verify the pleadings on behalf of the corporation. In addition thereto and de hors Order 29 Rule 1 of the CPC, as a company is a juristic entity, it can duly authorise any person to sign the plaint or the written statement on its behalf and this would be regarded as sufficient compliance with the provisions of Order 6 Rule 14 of the CPC. A person may be expressly authorised to sign the pleadings on behalf of the company, for example by the Board of Directors passing a resolution to that effect or by a power of attorney being executed in favour of any individual. In absence thereof and in cases where pleadings have been signed by one of its officers a Corporation can ratify the said action of its officer in signing the pleadings. Such ratification can be express or implied. The Court can on the basis of the evidence on record, and after taking all the circumstances of the case, especially with regard to the conduct of the trial come to the conclusion that the corporation had ratified the act of signing of the pleading by its officer.

The courts below could have held that Sh. L.K. Rohatgi must have been empowered to sign the plaint on behalf of the appellant. In the alternative it would have been legitimate to hold that the manner in which the suit was conducted showed that the appellant bank must have ratified the action of Sh. L.K. Rohatgi in signing the plaint. If, for any reason whatsoever, the courts below were still unable to come to this conclusion, then either of the appellate courts ought to have exercised their jurisdiction under Order 41 Rule 27(1)(b) of the CPC and should have directed a proper power of attorney to be produced or they could have ordered Sh. L.K. Rohatgi or any other competent person to be examined as a witness in order to prove ratification or the authority of Sh. L.K. Rohatgi to sign the plaint. Such a power should be exercised by a court in order to ensure that injustice is not done by rejection of a genuine claim.

The Courts below having come to a conclusion that money had been taken by respondent No. 1 and that respondent No. 2 and husband of respondent No. 3 had stood as guarantors and that the claim of the appellant was justified it will be a travesty of justice if the appellant is to be non suited for a technical reason which does not go to the root of the matter. The suit did not suffer from any jurisdictional infirmity and the only defect which was alleged on behalf of the respondents was one which was curable.

The court had to be satisfied that Sh. L.K. Rohatgi could sign the plaint on behalf of the appellant. The suit had been filed in the name of the appellant company; full amount of court fee had been paid by the appellant bank; documentary as well as oral evidence had been led on behalf of the appellant and the trial of the suit before the Sub Judge, Ambala, had continued for about two years, it is difficult, in these circumstances, even to presume that the suit had been filed and tried without the appellant having authorised the institution of the same. The only reasonable conclusion which we can come to is that Sh. L.K. Rohatgi must have been authorised to sign the plaint and, in any case, it must be held that the appellant had ratified the action of Sh. L.K. Rohatgi in signing the plaint and thereafter it continued with the suit

Conclusion:

Hon'ble Supreme Court held that that issue No. 1 i.e .issue regarding competency of person to file suit was wrongly decided by the courts below and this being so the appellant was entitled to a decree for recovery of money. Suit of the appellant was accordingly decreed by the Hon'ble Supreme Court with costs.

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