VOLUME 1 NUMBER 2 JULY 2009

JOURNAL OF BUSINESS AND ECONOMIC ISSUES

ISSN 0974-9144

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BISWAJIT DEY

A Publication of
Barrackpore Rastraguru Surendranath College

Department of Commerce

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Subscription Rate :

	India	Abroad
1-Year	Rs. 200	$ 8
3-Year	Rs. 550	$ 22
5-Year	Rs. 900	$ 36

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EDITORIAL

The Editorial Board takes the honour to write this editorial for the publication of the second issue of the Journal. The journal deserves appreciation for covering issues of greater corporate interest. We are optimist that the constructive ideas will give positive direction in the field of business and economy in the phase of global economic meltdown. Keeping this in to mind more research papers are expected from this area.

Of late Indian Inc has faced severe accounting crisis in consequence of Satyam computer service scam that reminds us of fundamental agency problem. This issue makes a good deal of attempt to highlight the conflict of interest between the shareholders and the management along with other new areas of business.

Agency problem has become a standing issue in the corporate world for a pretty long period of time. The conflict of interest between the shareholders and the management regarding the use of shareholders' fund can not stand on the way to sustainable development of the business. It is the responsibility either of shareholders and management to ensure good corporate governance in direct remit of agency problem. In this regard, Prof. Das and Prof. Ghosh have rightly identified some agency cost factors like free cash flows, dispersion of ownership, leverage etc as to impact upon dividend pay-out for the settlement of agency problem. Several other issues on reinsurance business, functioning of cooperative banks, Regional Rural Banks (RRBs), credit scoring for small firm financing are discussed in this issue. Reinsurance is an effective risk diversification measure in the insurance sector in which General Insurance Company (GIC) in India is playing a vital role. Prof. Bhattacharya and Prof. Gandhi have made an attempt to track down development of reinsurance business in India with special reference to GIC. Again, there is no denying the fact that cooperative banks have been performing well in rural India. To be specific, their role to provide micro credit to Self Help Groups (SHGs) is a stepping stone to welfare economy. Prof. Dey has given a direction in this area. There is also discussed the role of Bally cooperative bank in West Bengal for the period from 1997-98 to 2006-07 in this issue. Also, the role of RRBs to extend financial assistance to rural poor folk is worthy to mention. Prof. Chakraborty has focused on profitability performance of RRBs in India. Another emergent area of finance is credit scoring that Prof. Gangopadhya and Prof. Banerjee have observed to be an effective measure in case of small firm financing policy. The issues like health, income and health expenditure, digital learning materials in e-learning process have been covered with relevant empirical studies. Prof. Haldar and Prof. Sarkar have talked about investing in health to be a significant economic policy. Prof. Dhar and Prof. Nag have tried their best to determine criteria for evaluating the pedagogical usability of digital learning material and the role of the content to provide the learner with the best suitable learning material in e-learning process.

Editorial Board
Journal of Business and Economic Issues

Journal of
Business and Economic Issues
Vol. 1 No. 2 July 2009

Dividend Payout and Agency Cost Factors: A Study of Select Indian Companies

Jadab Krishna Das and Sudipta Ghosh***

ABSTRACT: Agency problem is the conflicting situation between the principal and agent. Agency costs arise due to conflicts of interest between shareholders and management. As owners' wealth (i.e. shareholders' fund) is managed by the managers in a joint stock company, there is every possibility of using shareholders' fund in private benefit of the managers. It is assumed that dividend payout may help to distribute funds in favour of shareholders and thus may be used to solve agency conflict. On the other hand agency cost factors like free cash flows; dispersion of ownership, leverage may have influential effect on dividend payout. Against this backdrop, in this paper a study has been made to understand the influence of agency cost variables on dividend payout in Indian context by selecting fifty Indian companies listed on BSE and /or NSE.

Key Words: *Agency cost, Dividend Payout, Free Cash Flow to Total Assets, Leverage, Security, Dispersion of Ownership, Interest Coverage Ratio.*

1. INTRODUCTION

Agency cost is one of the interesting areas in finance literature. A conflicting situation between the principal and agent is known as agency problem. Agency relationship is a contract under which one or more persons [the principal(s)] engage another person (the agent) to perform some services on their behalf, which involve delegating some decision making authority to agent. In this situation costs are incurred in an organization due to conflicts

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between shareholders and managers which is known as agency cost. These costs arise from, or must be paid to, an agent acting on behalf of a principal. So they are incurred due to principal-agent problem. Agency costs arise due to conflicts of interest between shareholders and management and separation of ownership and control of business. In finance literature, the common shareholders (equity shareholders) are known as principal and the managers are known as agent.

Shareholders' common interest is to maximize their value. But they do not operate the business. Managers may wish to grow the company for maximizing their personal power and wealth that may not be in the best interest of shareholders. It can not be avoided in an organization where ownership and management/control are two completely different issues and where the principals are not completely in charge (again it is the prime feature of the large scale joint stock companies). Agency costs are incurred to (a) monitor the managers' activities and (b) create incentive and compensation schemes and control for managers to take policies such that shareholders' value can be maximized. Agency costs create problems to maximize firm's value.

Shareholders are the owners of a firm's resources and these resources are controlled and managed by the managers. Now funds can be externally collected (like issue of equity shares and bonds) or internally generated (like retained earnings). If it comes from outsiders, then it comes with additional monitoring. Different parties (like shareholders, bondholders, lenders, banks, financial institutions, financial markets and regulatory authoritise like SEC, SEBI etc.) make monitoring arrangements on the management's performances. So, in this case agency costs are relatively low as the monitomig arrangements keep the managers' interests in line with the shareholders' interests. But when a firm's capital is largely self-financed through retained earnings, potential agency costs are higher as self financing is less subject to the monitoring of capital markets. So agency problem is expected to be higher when a firm's capital is self-financed and lower when capital is collected from outsiders.

Agency considerations play important role in determining the levels of dividends also. As per agency theory, dividend payment is a way to mitigate empire building or other value destroying activities. Firms may establish lower dividend payout ratios (when firms are experiencing or anticipate experiencing higher revenue growth and thus higher investment expenditures or when they have higher operating and financial leverage) or higher dividend payout ratios (when insiders held a lower fraction of equity) as per the situation and in this case dividend payment is used as a tool to distribute funds in favour of shareholders (and thus dividend payment helps to reduce agency conflicts between managers and shareholders). However, the demand of shareholders of a firm determines the optimal dividend payout.

Regarding agency problems, different studies have been done from different angles. Jensen (1986) did focus on free cash flow. Holder *et al.* (1998) examined the influence of agency costs on dividend policy. Ang and Cox (1997) made a study about controlling the agency cost of insider trading. Detail will be available in the literature review section.

Agency cost factors influence dividend payout in different manners. Five agency cost factors have been taken in this paper such as *free cash flow, dispersion of ownership, security factors (i.e. collateralizable assets), leverage, and interest coverage.* Large free cash flows can either be invested in profitable projects (having positive NPV) to support the growth opportunity or distributed to equity shareholders as dividend (even can be used in stock repurchase scheme). Otherwise managers can use it for their wealth creation. So free cash flow as an agency cost factor influences dividend payout in this way. Again firms having a greater proportion of outside equity can establish higher dividend payout ratio, so funds can be distributed in favour of them. Collateralizable assets also reduce agency problems as it reduces the need to restrict dividend payouts on the part of bondholders (firm's assets are used as collateral for loans) and thus it influences dividend payout. On the other hand shareholders of a firm with high/large proportion of debt can face different constraints/restrictions on dividend payments through bond agreement so the amount which was used to pay dividend now is to be used in interest payments. Similarly interest coverage influences dividend payout as more interest coverage means more protection to bondholders and less restriction on dividend payments.

In this background, this paper makes a modest attempt to test the influence of agency costs on dividend payout in Indian context. This paper measures the effect of different agency cost variables (as stated above like free cash flow, dispersion of ownership, security factors (i.e. collateralizable assets), leverage, and interest coverage) on dividend payout ratio.

2. LITERATURE REVIEW

Different studies have been conducted on agency problem and different studies find that dividend payment can be used to mitigate agency costs problems. Studies conducted by Rozeff (1982), Easterbrook (1984), Jensen (1986), La Porta (2000) etc. are important in this respect.

Rozeff (1982) suggested that the optimal dividend payout minimizes the sum of two costs:

(a) agency costs and (b) transaction costs of external financing.

Easterbrook (1984) examined that whether dividend payment is a method of aligning managers' interests with those of investors and offered agency cost explanations of dividends.

As per Jensen (1986), the agency conflicts are severe in firms with large free cash flows particularly when free cash flow is more than the profitable investment opportunities.

Ang and Cox (1997) studied about controlling the agency cost of insider trading. They used dividend payout (DivPay) as an independent variable in their regression model.

Holder *et al.* (1998) also found a very strong influence of agency costs on dividend policy decision after investigating the relationship between dividend policy decisions and investment decisions of the firms of 477 NYSE-listed companies.

La Porta *et al.* (2000) examined dividend policies of large corporations around the world (from 33 countries). Their data suggested that the agency approach is highly relevant to an understanding of corporate dividend policies through the world.

Elston *et al.* (2002) investigated the dividend payout behaviour of the firm controlling for the endogenous nature of the firm's institutional ownership and bank control in Germany. They took dividend payout (DivPay) and dividend growth (DivGrow) as outcome variables.

Mollah *et al.* (2007) conducted a study to test the influence of agency costs on dividend policy in the emerging market of Bangladesh in respect to the pre and post crisis periods of the 1998 financial crisis in the markets of Bangladesh. The study found agency cost variables to have only a modest explanatory power during the pre-crisis period (1988-1997) on the Dhaka Stock Exchange and none in the post-crisis period (1999-2003).

Chen *et al.* (2009) examined the effect of shareholder rights on reducing the cost of equity and the impact of agency problems from free cash flow on this effect and found that the effect of shareholder rights on reducing the cost of equity is significantly stronger for firms have more severe agency problems from free cash flows.

3. OBJECTIVE AND METHODOLOGY

The objective of this study is to show the relationship, if any, between agency cost factors and dividend payout. The study measures and analyses the influence of agency cost variables on dividend payout ratio in Indian context for a study period of five years. Regression analysis has been done for each of the five years individually and also analysis has been made for average of five years.

In this study, primarily 50 Indian companies (excluding financial companies and banks) listed on BSE and/or NSE has been selected. Companies are selected by stratified random sampling technique. Different industries/sectors like automobile, textiles, oil drilling and exploration, steel, paper, computer software and hardware, heavy engineering, electrical, diversified, personal care, pharmaceuticals etc. have been treated as different strata then simple random sampling technique was applied to select companies from each industry/sector. Then finally 35 companies have been considered as the rest 15 companies had some extreme values, statistically known as outliers in respect of the variables selected for the study. "Box-Plot" technique was applied to detect the outliers. The necessary data have been obtained from the website www.moneycontrol.com. The study is based on secondary data and it has been conducted for the five years. Selected five years are 2002-03 to 2006-07.

In the study 6 accounting ratios have been used: (1) *Dividend Payout Ratio (DPR),* (2) *Free Cash Flow to Total Assets (FCFTA),* (3) *Leverage (LVG),* (4) *Security (SEC),* (5) *Dispersion of Ownership (DOW),* and (6) *Interest Coverage Ratio (ICR).* These ratios are calculated below:

$$DPR = \frac{\text{Equity Dividend}}{\text{Operating Profit}}$$

$$FCFTA = \text{Proportion of Free Cash Flows to Total Assets} = \frac{\text{Free Cash Flows}}{\text{Total Assets}}$$

Where,

Free Cash Flows = Reported Net Profit (after tax) – Dividend (Equity + Pref.) + Depreciation.

And, Total Assets (excluding Preliminary Expenses) = Fixed Assets + Investment + Current Assets.

$$DOW = \text{Proportion of Ownership Capital to Total Assets} = \frac{\text{Equity Share Capital}}{\text{Total Assets}}$$

$$LVG = \text{Proportion of Debt Capital to Total Assets} = \frac{\text{Pref. Share Capital + Long Term Loans + Short Term Loans}}{\text{Total Assets}}$$

$$SEC = \text{Proportion of Net Fixed Assets to Total Assets} = \frac{\text{Net Block}}{\text{Total Assets}}$$

$$ICR = \frac{\text{EBITDA}}{\text{Interest}}$$

Where, EBITDA = Earnings before interest, taxes, depreciation and amortization. Here PBDIT (Profit before depreciation, interest and tax) is used instead of EBITDA.

In this study DPR is selected as dependent variable as this study attempts to judge the influence of agency cost variables on dividend payout. Generally dividend payout is calculated as Equity Dividend/PAT, but as PAT may be zero or negative, DPR is calculated as Equity

Dividend/Operating Profit. Reason behind selecting other five variables as agency cost variables are as follows:

FCFTA: Different studies support that dividend payments reduce agency costs by reducing discretionary funds available to the managers. Higher dividend payout may reduce free cash flows available to the managers. Less free cash flow to managers indicates less opportunity for them to engage in value reducing activities for their own benefits.

DOW: Generally firms having a lower fraction of inside equity and/or a greater proportion of outside equity establish higher dividend payout ratio.

LVG: Shareholders can *expropriate* wealth from bondholders by paying dividends themselves. By putting different constraints/restrictions on dividend payments through bond agreement bondholders can reduce dividend payout to common shareholders as, the amount which is used to pay dividend now can be used to entertain them.

SEC: SEC denotes '*collateralizable assets*'. As per Mollah *et.al.* (2007), collateralizable assets reduce agency problems between the bondholders and the stockholders and thus reduce the need to restrict dividend payouts on the part of bondholders. Here, firm's assets can be used as collateral for loans.

ICR: Interest Coverage Ratio is used to test the firm's debt serving capacity. It shows the number of times the interest charges are covered by funds that are available for their payment.

Three types of analysis have been done: (1) *Descriptive Statistics* (2) *Correlation* and (3) *Regression Analysis*. Statistical results have been calculated for the five years study period. *DPR* has been selected as *'dependent variable'* where as other five variables (i.e. *FCFTA, DOW, LVG, SEC and ICR*) have been used as *'predictors'* or *'explanatory variables'*.

Using multiple regression model, we set the following:

$$DPR = \beta_0 + \beta_1 FCFTA + \beta_2 DOW + \beta_3 LVG + \beta_4 SEC + \beta_5 ICR$$

Where,

β_0 = a constant, the value of DPR when all independent variables are zero

β_1 = the slope of the regression surface (the β represents the regression coefficient associated with each independent variable)

4. DATA ANALYSIS AND FINDINGS

In this section statistical results (*for statistical results, please see appendix-2*) have and findings from those results have been discussed.

4.1. Descriptive Statistical Analysis

(for descriptive statistical analysis please see table no. 1, 4, 7, 10, 13)

Important findings based on descriptive statistics (Mean, Standard Deviation, Skewness and Kurtosis) are given as below:

- For the study period, DPR shows an increasing trend (slightly decreased in the year 2005-06). It indicates more amounts have been distributed in favour of shareholders, which indicates reduction in agency problems.
- The mean value of FCFTA (%) ranged from 6.975 to 9.643. Increasing free cash flow indicates more chance of agency problems as free cash flow can be used by the managers for their personal benefits.
- The average DOW shows a decreasing trend. It indicates that for selected Indian companies, on an average, the amount invested in total assets is financed less than 7 % by equity shares. Decreasing trend of DOW indicates that selected companies are less dependent on owners' capital at the end of the study period and the debt holders have certain role to play. On the other hand, ICR reveals an increasing trend through the study period, which again indicates the large chance of power play by the debt holders in protecting their interest. Volatility of ICR is also increasing.
- The above finding is established by the statistical result of LVG also, as it is observed that LVG is more than 60% through the study period i.e. the selected companies collect more than 60% of their funds from Debt capital. So, debt holders may put some constraints regarding dividend payment to equity shareholders.
- SEC shows a decreasing trend in security factor. It is an indication of agency problem between debt holders and equity shareholders. Increasing trend of ICR may be due to decrease in SEC. So, the analysis is consistent and supports the explanation of SEC, LVG and ICR.
- Considering coefficient of variation (CV) from five-year average data we get ICR as the most volatile (CV = 96.11) and LVG as the least volatile (CV = 19.54) agency cost variable.
- For the whole study period, ICR is positively skewed which indicates most of the companies belong to lower interest coverage group. DPR is also positively skewed. Again, we can conclude that majority of the companies belong to lower dividend payout group. LVG is negatively skewed, so most of the companies have higher leverage.

- Kurtosis of DPR is positive for the whole study period and it is increasing. So we ge more concentration of values near the central value at the end of the study period Kurtosis of FCFTA is negative for the study period except 2004-05 and kurtosis of SEC is also negative for the study period except 2006-07.In the year 2002-03, 2005-06 and 2006-07, kurtosis of ICR indicates high concentration of values near the central value.

4.2. Correlation Analysis

(for correlation analysis please see table no. 2, 5, 8, 11, 14)

Following points are important in relation to association of different variables:

- Association between DPR and FCFTA is positive and significant for the year 2002-03 and 2005-06. So more free cash flows ensure more dividend payments. That means equity shareholders try to get more resource in favour of them in time of accumulation of more free cash flows and it is the expected behaviour of equity shareholders as per the agency theory.
- Throughout the study period, DPR and DOW, these two variables have negative association. As more the dispersion of ownership, less the chance of being exploited by the agents, the requirement of dividend distribution is becoming less. This is the possible reason behind the negative association between DPR and DOW.
- From the correlation between DPR and LVG, it is clear that, the association is negative and significant. It may be so as the selected companies are financed more than 60 % by debt capital, debt holders put some constraint on dividend payments. Because as per agency theory, debt holders put some constraint on dividend payments to safeguard their interest.
- The association between DPR and SEC shows a negative relationship through out the study period. This result to some extent contradicts to agency theory.
- Throughout the study period, the correlation coefficients between DPR and ICR are positive and significant. Increasing interest coverage indicates more safety to debt holders, which may lead more dividend payment.
- Correlation coefficients between FCFTA and LVG indicate a moderately strong but negative relationship throughout the study period.
- Association between ICR and FCFTA is positive throughout the study period.
- ICR and LVG have negative and significant association for the selected study period. Again it is natural as more debt financing leads to more interest payments, which makes less interest coverage ratio.

4.3. Regression Analysis

(for regression analysis please see table no. 3, 6, 9, 12, 15)

Findings of the regression analysis of the five years are given below:

- For the year 2002-03, R^2 (coefficient of determination) = 61%. So 61% variation in DPR is explained by the selected independent variables and 39% variation in DPR is not explained by the model. So selected agency cost variables explain more than 60% variability in dividend payout.
- For the next three years (i.e. 2003-04, 2004-05 and 2005-06) the explanatory power of the regression equation is near about 50%. So we can conclude, on that time other factors explained rest 50% variability in dividend payment. But in the year 2006-07 R^2 becomes near about 62%.
- In similar way, standard error of the estimate is relatively high for the year 2003-04, 2004-05 and 2005-06.
- From, ANOVA we get significant regression (at 0.01 level) for the whole study period. It indicates the regression function explains a significant amount of variability in DPR.
- Coefficients of ICR are significantly different from zero except for the year 2002-03. Other significant independent variables are: 2002-03: DOW, LVG; 2004-05: SEC; 2005-06: SEC; 2006-07: SEC, DOW. If we consider 5 year average data set then ICR and SEC are significant independent variables.

4.4. Analysis from the pooled data set:

(for analysis of pooled data please see table no. 16, 17, 18)

Now if we consider the pooled data set and analyse it, we get following findings:

- On the basis of average of 5 years the dividend payout ratio is around 9.85%. So, on an average the selected companies paid near about 10% of operating profit as equity dividend.
- Correlation between LVG and DPR, ICR and DPR, FCFTA and ICR, FCFTA and LVG and LVG and ICR are found significant.
- Regression equation explains 61% variation in DPR and the regression is significant ($F= 9.08$, $p = 0.000$).

5. CONCLUDING OBSERVATIONS

Dividend payments reduce uncertainty of shareholders as it indicates cash flows to them and thus make a solution to the agency problems. From the study it is clear that, the selected agency cost variables have more than average explanatory power to explain the variation in dividend payment. The selected agency variables have influential effect on dividend payout on study period. As a whole, we get linear relationship between the dependent variable (DPR) and five independent variables: FCFTA, DOW, LVG, SEC and ICR. So from this study, the agency theory of dividend behaviour does appear to influence the dividend payout with respect to selected Indian companies. In Indian perspective, it is clear

that debt holders have some influential role in respect of dividend payout. Again interest coverage ratio is found as an important variable in study of agency cost.

The findings of this study are to some extent similar to the findings of the study made by Holder *et al.* (1998). Our paper found more than average influence of agency costs on dividend payout where as Holder *et al.* (1998) found a very strong influence. Again, the study made by Mollah *et al.* (2007) found agency cost variables to have only a modest influence (similar to the findings of this paper) during the pre-crisis period (1988-1997) on the Dhaka Stock Exchange [although no influence in the post-crisis period (1999-2003)] in respect to the emerging market of Bangladesh.

This topic can be dealt by selecting new variables also. Because from the study it is evident that the selected explanatory variables jointly explained near about 60% variation in DPR. So more new variables (like insider ownership) must be considered to get more clear picture.

In this paper only thirty five (35) Indian companies have been selected. Sample size can be increased up to the considerable and manageable limit. The study period can also be extended.

However, further research can be done on this topic. Such as Influence of agency theory on dividend policy can be examined in emerging markets. Family controlled businesses, high degree of ownership concentration etc. are features of emerging markets. Again some of these features can be used as agency cost variables.

REFERENCES

Ang, J. S., and Cox, D. R. (1997). Controlling the Agency Cost of Insider Trading. *Journal of Financial and Strategic Decisions,* 10(1).

Chen, K. C. W., Chen, Z., and Wei, K. C. John (2009). Agency Costs of Free Cash Flow and the Effect of Shareholder Rights on the Implied Cost of Equity Capital. *Journal of Financial and Quantitative Analysis (JFQA),* Forthcoming.

Easterbrook, F. H. (1984). Two Agency Cost Explanations of Dividends. *American Economic Review,* 74(4).

Elston, J. A., Hofler, R., and Lee, J. (2002). Institutional Ownership, Agency Costs and Dividend Policy, http://www.bus.ucf.edu/wp/content/archives/div%20policy-12-12-2002.pdf.

Holder, M., Hexter, J. L., and Langrehr, F. (1998). Dividend Policy Determinants: An Investigation of the Influences of Stakeholder Theory. *Financial Management, 27.*

Jensen, M. C. (1986). The Agency Cost of Free Cash Flow, Corporate Finance and Takeover. *American Economic Review,* 76(2).

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishny, R. W. (2000). Agency Problems and Dividend Policies around the World. *Journal of Finance,* February.

Mollah, A. S., Rafiq, R. B., and Sharp, P. A. (2007). Relevance of Agency Theory for Dividend Policy in an Emerging Economy: The Case of Bangladesh. *The ICFAI Journal of Applied Finance,* 13(12).

Rozeff, M. S. (1982). Growth, Beta and Agency Costs as Determinants of Dividend Payout Ratios. *The Journal of Financial Research,* 5(3).

Appendix-1

FINALLY SELECTED 35 COMPANIES AND INDUSTRIES

SELECTED COMPANIES	INDUSTRY
Tata Motors	Auto - LCVs/HCVs
Waterbase	Aquaculture
Excel Industries	Pesticides/Agro Chemicals
Simplex Infrastructures	Construction & Contracting - Civil
Larsen and Toubro	Diversified
Agro Tech Foods	Edible Oils & Solvent Extraction
Emco	Electric Equipment
Nava Bharat Ventures	Diversified
Havells India	Electric Equipment
Jai Balaji Industries	Steel - Sponge Iron
Kanpur Plastipacks	Packaging
CMC	Computers - Hardware
Zicom Security Systems	Electricals
NRB Bearings	Bearings
Zuari Industries	Fertilizers
Filatex India	Textiles - Manmade
Parekh Aluminex	Packaging
Jindal Steel & Power	Steel - Sponge Iron
Relaxo Footwears	Leather Products
Suzlon Energy	Engineering - Heavy
Jindal Poly Films	Packaging
Berger Paints India	Paints/Varnishes
West Coast Paper Mills	Paper
Exide Industries	Auto Ancillaries
Steel Authority of India	Steel - Large
Tantia Constructions	Construction & Contracting - Civil
Siyaram Silk Mills	Textiles - Weaving
Jet Airways	Transport
Ceat	Tyres
Oil and Natural Gas Corporation	Oil Drilling And Exploration
Bharat Petroleum Corporation	Refineries
GAIL India	Oil Drilling And Exploration
TIL	Engineering - Heavy
Orient Paper and Industries	Diversified

Zandu Pharmaceuticals Works	Pharmaceuticals

Appendix-2

2.1. STATISTICAL RESULT: 2002-2003 (n = 35)

Table 1

Descriptive Statistics

Variable	Mean	St Dev	Minimum	Maximum	Skewness	Kurtosis
DPR	8.13	7.71	0.00	28.45	0.88	0.10
FCFTA	6.975	3.845	-0.627	16.012	0.29	-0.18
DOW	0.065	0.0652	0.0081	0.2280	1.55	1.24
LVG	0.6537	0.1677	0.2472	0.9799	-0.38	0.15
SEC	0.3772	0.1652	0.1052	0.6984	0.19	-0.58
ICR	5.99	6.57	-0.56	33.56	2.52	8.31

Table 2

Correlations

	DPR	FCFTA	DOW	LVG	SEC
FCFTA	0.576 0.000				
DOW	-0.219 0.207	-0.034 0.848			
LVG	-0.629 0.000	-0.631 0.000	-0.186 0.284		
SEC	-0.326 0.056	0.057 0.746	0.135 0.441	0.232 0.179	
ICR	0.567 0.000	0.523 0.001	-0.020 0.908	-0.459 0.006	-0.251 0.146

Note: Cell Contents: Pearson correlation: P-Value

Table 3

Regression Analysis

Predictor	Coef	SE Coef	T	P
Constant	20.960	6.762	3.10	0.004
FCFTA	0.3817	0.3511	1.09	0.286
DOW	-31.39	14.72	-2.13	0.042

LVG	-19.167	7.812	-2.45	0.020
SEC	-6.784	6.220	-1.09	0.284
ICR	0.2745	0.1697	1.62	0.117

S = 5.21241; R-Sq = 61.0%; R-Sq (adj) = 54.3%

The regression equation is:

DPR = 21.0 + 0.382 FCFTA - 31.4 DOW - 19.2 LVG - 6.78 SEC + 0.274 ICR

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	5	1232.77	246.55	9.07	0.000
Residual Error	29	787.91	27.17		
Total	34	2020.68			

2.2 STATISTICAL RESULT: 2003-2004 (n = 35)

Table 4

Descriptive Statistics

Variable	Mean	St Dev.	Minimum	Maximum	Skewness	Kurtosis
DPR	9.50	8.32	0.00	31.94	0.80	0.11
FCFTA	8.519	4.330	1.906	16.313	0.12	-1.15
DOW	0.0593	0.0620	0.0028	0.2616	1.76	2.58
LVG	0.6576	0.1465	0.3565	0.9925	-0.10	0.30
SEC	0.3516	0.1712	0.0860	0.6473	0.25	-1.13
ICR	8.21	8.47	0.81	31.60	1.53	1.43

Table 5

Correlations

	DPR	FCFTA	DOW	LVG	SEC
FCFTA	0.142 0.415				
DOW	-0.139 0.426	0.055 0.753			
LVG	-0.539 0.001	-0.324 0.057	-0.192 0.268		
SEC	-0.307 0.073	0.418 0.012	0.109 0.532	0.172 0.322	
ICR	0.609 0.000	0.405 0.016	-0.067 0.703	-0.533 0.001	0.024 0.893

Note: Cell Contents: Pearson correlation: P-Value

Table 6

Regression Analysis

Predictor	Coef	SE Coef	T	P
Constant	22.082	7.625	2.90	0.007
FCFTA	-0.0586	0.3126	-0.19	0.853
DOW	-18.04	18.16	-0.99	0.329
LVG	-16.191	9.590	-1.69	0.102
SEC	-11.718	7.449	-1.57	0.127
ICR	0.4573	0.1586	2.88	0.007

S = 6.20308 R-Sq = 52.6% R-Sq (adj) = 44.4%

The regression equation is:
DPR = 22.1 - 0.059 FCFTA - 18.0 DOW - 16.2 LVG - 11.7 SEC + 0.457 ICR

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	5	1236.63	247.33	6.43	0.000
Residual Error	29	1115.87	38.48		
Total	34	2352.49			

2.3 STATISTICAL RESULT: 2004-2005 (n = 35)

Table 7

Descriptive Statistics

Variable	Mean	St Dev	Minimum	Maximum	Skewness	Kurtosis
DPR	10.57	9.60	0.00	35.09	1.05	0.46
FCFTA	8.274	5.295	0.647	22.709	1.01	0.68
DOW	0.05161	0.04719	0.00236	0.15999	1.16	0.07
LVG	0.6614	0.1346	0.3560	0.9812	-0.24	0.66
SEC	0.3171	0.1600	0.0621	0.6966	0.54	-0.08
ICR	8.45	8.56	0.72	31.22	1.53	1.60

Table 8

Correlations

	DPR	FCFTA	DOW	LVG	SEC
FCFTA	0.174 0.317				
DOW	-0.104 0.552	0.082 0.640			
LVG	-0.402 0.017	-0.506 0.002	-0.229 0.186		
SEC	-0.260 0.131	0.197 0.257	-0.024 0.889	-0.010 0.954	
ICR	0.591 0.000	0.523 0.001	0.076 0.666	-0.660 0.000	0.104 0.553

Note: Cell Contents: Pearson correlation: P-Value

Table 9

Regression Analysis

Predictor	Coef	SE Coef	T	P
Constant	17.79	11.09	1.60	0.119
FCFTA	-0.2435	0.2967	-0.82	0.419
DOW	-34.27	27.82	-1.23	0.228
LVG	-5.74	13.46	-0.43	0.673
SEC	-18.405	8.168	-2.25	0.032
ICR	0.7322	0.2081	3.52	0.001

S = 7.41151; R-Sq = 49.2%; R-Sq (adj) = 40.4%

The regression equation is

DPR = 17.8 - 0.244 FCFTA - 34.3 DOW - 5.7 LVG - 18.4 SEC + 0.732 ICR

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	5	1543.17	308.63	5.62	0.001
Residual Error	29	1592.99	54.93		
Total	34	3136.15			

2.4 STATISTICAL RESULT: 2005-2006 (n = 35)

Table 10

Descriptive Statistics

Variable	Mean	St Dev	Minimum	Maximum	Skewness	Kurtosis
DPR	10.38	9.44	0.00	39.24	1.07	1.02
FCFTA	7.598	4.319	-2.310	16.334	-0.28	-0.24
DOW	0.04694	0.04334	0.00208	0.16514	1.34	0.94
LVG	0.6337	0.1330	0.2629	0.9551	-0.46	1.37
SEC	0.3154	0.1710	0.0669	0.6898	0.48	-0.49
ICR	8.55	10.34	0.54	51.41	2.71	8.70

Table 11

Correlations

	DPR	FCETA	DOW	LVG	SEC
FCFTA	0.492 0.003				
DOW	-0.093 0.595	-0.161 0.357			
LVG	-0.515 0.002	-0.545 0.001	-0.146 0.403		
SEC	-0.297 0.083	-0.013 0.941	0.077 0.659	0.065 0.710	
ICR	0.637 0.000	0.531 0.001	0.069 0.694	-0.644 0.000	-0.086 0.622

Note: Cell Contents: Pearson correlation: P-Value

Table 12

Regression Analysis

Predictor	Coef	SE Coef	T	P
Constant	15.67	10.72	1.46	0.154
FCFTA	0.3463	0.3677	0.94	0.354
DOW	-21.83	29.90	-0.73	0.471
LVG	-9.84	12.95	-0.76	0.454

SEC	-13.229	7.200	-1.84	0.076
ICR	0.4103	0.1612	2.54	0.017

S = 7.10652; R-Sq = 51.6%; R-Sq (adj) = 43.3%

The regression equation is

DPR = 15.7 + 0.346 FCFTA - 21.8 DOW - 9.8 LVG - 13.2 SEC + 0.410 ICR

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	5	1562.50	312.50	6.19	0.001
Residual Error	29	1464.58	50.50		
Total	34	3027.08			

2.5 STATISTICAL RESULT: 2006-2007 (n = 35)

Table 13

Descriptive Statistics

Variable	Mean	St Dev	Minimum	Maximum	Skewness	Kurtosis
DPR	10.65	8.75	0.00	36.78	1.21	1.25
FCFTA	9.643	4.524	1.024	19.173	0.39	-0.36
DOW	0.04325	0.03908	0.00203	0.15257	1.32	0.91
LVG	0.6154	0.1319	0.2507	0.8459	-0.68	0.58
SEC	0.3042	0.1690	0.0611	0.7156	0.58	0.03
ICR	9.94	11.40	. 1.14	59.05	2.96	10.15

Table 14

Correlations

	DPR	FCFTA	DOW	LVG	SEC
FCFTA	0.233 0.179				
DOW	-0.007 0.966	-0.061 0.730			
LVG	-0.527 0.001	-0.381 0.024	-0.288 0.093		
SEC	-0.322 0.059	0.033 0.852	-0.016 0.927	0.022 0.899	
ICR	0.707 0.000	0.393 0.020	0.238 0.168	-0.683 0.000	-0.095 0.589

Note: Cell Contents: Pearson correlation: P-Value

Table 15

Regression Analysis

The regression equation is

DPR = 20.9 - 0.187 FCFTA - 50.2 DOW - 11.7 LVG - 13.3 SEC + 0.502 ICR

Predictor	Coef	SE Coef	T	P
Constant	20.917	8.814	2.37	0.024
FCFTA	-0.1870	0.2511	-0.74	0.462
DOW	-50.19	27.50	-1.82	0.078
LVG	-11.74	10.84	-1.08	0.287
SEC	-13.307	5.996	-2.22	0.034
ICR	0.5016	0.1246	4.03	0.000

S = 5.85825 R-Sq = 61.8% R-Sq (adj) = 55.2%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	5	1607.08	321.42	9.37	0.000
Residual Error	29	995.25	34.32		
Total	34	2602.34			

2.6 Statistical Result for Average of 5 Years (n = 35)

Table 16

Descriptive Statistics

Variable	Mean	St Dev	Minimum	Maximum	Skewness	Kurtosis
DPR	9.85	8.10	0.00	32.42	0.99	0.39
FCFTA	8.202	3.542	1.783	14.810	0.16	-0.89
DOW	0.05324	0.04825	0.00470	0.16564	1.23	0.24
LVG	0.6444	0.1259	0.3228	0.9428	-0.30	0.54
SEC	0.3331	0.1567	0.0774	0.6770	0.30	-0.46
ICR	8.23	7.91	1.32	35.23	1.86	3.63

Table 17

Correlations

	DPR	FCFTA	DOW	LVG	SEC
FCFTA	0.426 0.011				
DOW	-0.157 0.369	-0.045 0.797			
LVG	-0.591 0.000	-0.513 0.002	-0.155 0.375		
SEC	-0.302 0.078	0.175 0.315	0.063 0.719	0.092 0.600	
ICR	0.678 0.000	0.561 0.00	0.031 0.860	-0.651 0.000	-0.027 0.876

Note: Cell Contents: Pearson correlation: P-Value

Table: 18

Regression Analysis

Predictor	Coef	SE Coef	T	P
Constant	21.326	8.670	2.46	0.020
FCFTA	0.1555	0.3452	0.45	0.656
DOW	-31.98	20.07	-1.59	0.122
LVG	-16.26	10.50	-1.55	0.132
SEC	-13.709	6.284	-2.18	0.037
ICR	0.4852	0.1672	2.90	0.007

S = 5.47349; R-Sq = 61.0%; R-Sq (adj) = 54.3%

The regression equation is:

DPR = 21.3 + 0.155 FCFTA - 32.0 DOW - 16.3 LVG - 13.7 SEC + 0.485 ICR

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	5	1359.47	271.89	9.08	0.000
Residual Error	29	868.81	29.96		
Total	34	2228.28			

Journal of
Business and Economic Issues
Vol. 1 No. 2 July 2009

Health, Income and Health Expenditure: A Search for Bi-variate Causality Analysis for the Indian States

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ABSTRACT: There exists a wide range of variation of income, health expenditure and health status across the large 15 states in India. The empirical validity of the theoretical model on income, health and healthcare relationships has been examined for India and her fifteen large states considering a longitudinal data for the twenty-six years (from 1980-81 to 2005-06). Both ways causality has been examined between socio-economic status of health, income and health expenditure using Granger Causality tool. The results vary across the states. The findings of the impact of health on income and health expenditure and vice-versa, impact of health expenditure on health and income and vice-versa are examined in the light of bi-variate Granger causality tool and the analysis of the degree of interconnections are expected to contribute to a deeper understanding of the benefits of investing in health. This analysis may be significant for economic policymaking and may help to contribute to socioeconomic development plan at the disaggregate level in India.

Key Words: *Stationarity, Bi-variate causality, Unit-root.*

1. INTRODUCTION

Traditionally, economic theory has given emphasis on physical capital accumulation as the most robust source of economic growth, at least in the short-run, with exogenous technical progress being the long-run determinant of growth. From the early 1990s, various

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[The Authors are very grateful for comments from Sharmila Banerjee, R. N. Bhattacharya, and Rajarshi Majumder and especially thankful to Ajitava Raychoudhury for giving valuable suggestions.]

studies have attempted to identify the determinants of economic growth; long-run growth is endogenous rather than exogenous (Lucas 1988). The role of human capital (comprising health, education and skill) is now almost universally regarded as being indispensable in this regard. Sustained economic growth depends on levels of human capital whose stocks increase as a result of higher levels of health status, better education and new learning and training procedures. Without a labor force with some minimum levels of education and health status, a country is incapable of maintaining a state of continuous growth (Lopez-Casasnovas et al. 2005). Since health is an important determinant of productivity and countries like India are more labour dependent, it follows that there should be a higher value accorded to having a healthier workforce to maximize production. Besides, there are thresholds to health status, below which functioning and productivity are assumed to be seriously impaired. Moreover, India being the second largest populous country in the world, with a wide range of health and socioeconomic diversity (across the states), the association between health status, health expenditure and income is of paramount importance. The analysis of the degree of interconnections between health, income and health expenditure are expected to contribute to a deeper understanding of the benefits of investing in health. This analysis may be significant for economic policymaking and may help to contribute to socioeconomic development at the disaggregate level in India.

2. REVIEW OF LITERATURE

It is commonly believed that economic growth leads populations to live better and longer lives with good health. Firstly, economic growth means rising per capita income and part of this increased income is translated into the consumption of higher quantity and better quality nutrients. Through nutrition, health as measured by life expectancy leads to increases in income (Fogel 1997). Secondly, economic growth is fuelled by technological progress and part of this progress is reflected in improvements in medical science (Rosen 1993; Morand 2005). The state of health in a country affects its economic growth through various channels[1]. When health improves the country can produce more output with any given combination of skills, physical capital and technological knowledge. One way to think about this effect is to treat health as another component of human capital[2] incorporated in formulating the endogenous growth models (Barro 1991 and Mankiw et al. 1992; Thomas et al. 1997; Bloom et al 2001). Central to these long-term growth models is the idea that technology is endogenous to the growth process (Romer 1986; Lucas 1988). The effects of human capital variables (namely, health and education) imply that the investment rate tends to increase as levels of education and socioeconomic status of health rise. Longer life expectancy encourages larger investments in human capital, which in turn accelerates the per capita income. The explanation of larger investments on human capital due to longer life expectancy is offered by Stark (1995) in terms of intergenerational transfer of assets. Higher educational level and better health status evolve systematically in accordance with the economic development of an economy. The provision of public resources for better health can assist the poor to release resources for other investments, such as in education, as a means to escape from poverty.

The relationship between socio-economic status and health is one of the most robust findings in health economics. A positive relationship between socio-economic status[3] and health has been observed across the countries in the world at different time periods (Berkman 1988; Marmot et al. 1991; Feinstein 1993; Deaton et al. 2001; Deaton 2003). A prominent view in the literature is that higher socio-economic status leads to reductions in psychosocial and environmental risk factors. For example, education could induce better health behaviors or income could be used to purchase higher quality daily used housing needed or to visit doctors for regular health checkups. Similarly, studies of the effects of health on income or its growth divide the whole literature into two broad heads. The first comprises cross-national data over the long time period to assess the impact of measures of health at the national level on income or its growth. These quantitative studies certainly have some strong micro foundations. The second comprises studies at the individual level that include one or more measures of health status along with extensive other information. Healthier populations tend to have higher labor productivity, because workers are physically more energetic, mentally more robust and suffer from fewer lost workdays from illness of their own or family members.

The long-term relationship between income and health is examined by Arora (1999) considering the developed countries in the world and has observed the hypotheses that health of the population has influenced economic growth and that it should be an integral component of the productivity of economies and supporting the endogenous growth models. A similar study made by Arora (2001) provides that in the co-integrated relation between health and income, innovations in health lead to economic growth and not vice-versa. Arora's findings are found to be similar to those reported by Fogel (1994, 1997) who has carried out a study on Western Economies over the past two centuries, from 1780 to 1979. In analyzing cross-country data over the past 25 years, Bloom and Sachs (1998) have obtained empirical evidence that health and demographic variables play an important role in determining economic growth rates. More recent studies have examined the effects of life expectancy on economic growth in the subsequent 15 to 25 years which have consistently found strong positive direct effects as well as indirect ones operating through rates of investment in physical capital or demographic profiles of the populations (Barro 1997; Sachs and Warner 1997; Bloom and Williamson 1998). Bhargava et al. (2001) have assessed the effects of initial health status on growth over a shorter period of 5 years in a panel of countries and likewise found strong effects, but only in low-income countries. A series of macroeconomic cross-country studies also have found evidence for a significant impact of health (measured by life expectancy) on economic growth (Mayer-Foulkes 2001; Caselli et al. 1996; Gallup and Sachs 2000). The impact of health on income is an important policy issue that has motivated research at the World Health (2001). Mayer-Foulkes et al. (2001) have observed in the Mexican states that there has been a significant long-term impact (25-30 years) of life expectancy on economic growth. Considering longitudinal data from two countries (with different institutional environments), USA and Netherlands, Hurd and Kapteyn (2003) have arrived at the conclusion that income and wealth inequality is closely connected with health inequality. Deaton (2003) has argued that it is not true that income inequality itself is a major determinant of population health. He does not find a high (significant) correlation between

life expectancy and income inequality among the rich countries; infant and child mortality in developing countries is primarily a consequence of poverty so that, conditional on average income, income inequality is important only because it is effectively a measure of poverty.

Very few studies are designed to distinguish between the impact of health on economic growth and that of growth on health (i.e., both way causality) across the countries. Bhargava's (2001) and Adams et al. (2003) studies are really exceptional in this direction. Bhargava finds that adult survival rate affects growth in low-income countries. This is more or less consistent with a recent study by Archand (2001) on the role of nutrition in growth. By studying the productivity growth associated with stature raises in Korea and Norway, Weil (2001) arrives at similar conclusion about the contribution of health to economic growth. Adams et al. (2003) have tested Granger causality between income and health based on data from three waves of the AHEAD (viz. Association for Higher Education Access and Disability). They use 19 health conditions to explain wealth change; and wealth, income and education to explain mortality and incidence of the 19 health conditions. Their results suggest a causal link between changes in health and changes in SES (Socio Economic Status; as measured by wealth change).

A majority of the studies, analyzing the relationship between income and health expenditure belongs to the developed countries[4(a)]. In India, the longitudinal studies on the relationship between health, income and health expenditure are very few. Using time series data set from 1974-75 to 1990-91 across the 15 major states in India, Reddy and Selvaraju (1994) have found that there is a strong relationship between per capita health expenditure (public) and per capita income and the health care expenditure is elastic to changes in income[4(b)]. One can raise the validity of the regression results obtained by Reddy et al. Development in time series econometrics suggests that if two series are non-stationary then OLS regression can yield spurious result (Wooldridge 2000). Based on time series (for five reference points of time) and cross-sectional pooled data for the 15 large states in India, Gupta and Mitra (2001) have observed that (a) per capita government health expenditure is unambiguously and positively related to health status (measured by IMR) (b) higher per capita income is seen to result in better health status and (c) higher economic growth affects health status on the one hand and better health status reinforces the trends in growth of income on the other. Drawing data from the 14 major states of India over a time span of 23 years (1974-75 to 1996-97) and using recent advances in panel data time series econometrics, Chakrabarty and Rao (2005) have observed the presence of long-run relationship between income and public health care expenditure and argued that publicly provided health services in India should be considered as 'necessities'. In the recent past, using panel co-integration technique, Bhat and Jain (2006) have estimated the relationship between income and health care expenditure across the 14 major states in India. Their study reveals that the income elasticity of health expenditure vary to a large extent (both in magnitudes and signs) across the states in India[5].

3. OBJECTIVE

The first objective of our study is to understand the regional disparity (across the large 15 states in India) in respect of health status, health expenditure and income; in addition to this a relative progress is assessed across the states over the period (viz.1980-81 to 2005-06) in respect of all these three variables. The second objective of the study is to examine the relationship between (a) health status and income (b) health status and health expenditure and (c) income and health expenditure across the large fifteen states in India from 1980-81 to 2005-06. Since the variables like health status (measured by Infant Mortality Rate), income (measured by Per Capita Net Domestic Product) and health expenditure (measured by Per Capita Health Expenditure) are time dependent, simple regression of health status on income or regression of health expenditure on health status or health expenditure on income may generate spurious regression (or correlation). In order to get rid off this problem in time series econometrics, we have considered different tools as discussed in the methodology. Here, we have assumed that decline of IMR is an improvement of health status.

4. LIMITATION OF THE ANALYSIS

The majority of the population in India depends on the public health care services. But the out of pocket expenditure as percentage of total expenditure on health is really high enough and is estimated at 84.6 (World Health Report 2000). Moreover, privately owned health care system has been running in India. It can be assumed that the poor people do have less capability to go for treatment at the privately run health institutions. Rather, they are more dependent on the publicly provided health care services. Since data on private health care expenditure is unavailable at the state level, we just consider the per capita public health expenditure as a proxy for total health expenditure. Health status is an unobservable variable but it can be assessed by the reduction of mortality, morbidity and sickness. Progress of health at the macro level can be measured by the improvement of life expectancy, reduction of infant or child mortality etc (Santerre and Neun 2000). But due to non-availability of yearly data on life expectancy, we consider only the IMR as a proxy for health status in India and her 15 large states in our analysis. Decline of IMR is generally thought as an improvement of health status (WHO 1997; Gupta et al 2001). We believe that life expectancy or morbidity prevalence rate could be a better measure of health status. Our analysis is based on time series data for 26 years only. But the improvement of health status at the macro level requires a longer time span; here 26 years time seems not to be too long.

5. THE DATA AND METHODOLOGY

The data on infant mortality rate was drawn from Sample Registration System-Registrar General, Government of India. The Per Capita Net State Domestic Product of the state and Per Capita Health Expenditure were collected from Reserve Bank of India Bulletin (various issues) and CSO, Ministry of Statistics & Programme Implementation, GoI respectively. In some of the cases, Govt. of India's website (www.indiastat.com) was visited. The health care

expenditure as well as NSDP is measured in real (at 1980-81 price) per capita terms. The variables are measured in natural logarithm for the generalization (i.e to transfer multiplicative model of time series to additive model)[4c]. Here, income is measured by Per Capita Net State Domestic Product (PCNSDP), health status is measured by Infant Mortality Rate (IMR) and health expenditure is measured by Per Capita Health Expenditure (PCHE).

The notations used in the analysis are: g= ln (PCNSDP), i = ln (IMR) and e= ln (PCHE)

For estimating the relationship among those variables (viz. PCNSDP, IMR, PCHE) the present study employs Granger's (1981) Test for causality that proposed first to test the direction of causality in time series econometrics between two variables in each phase. This technique is helpful in time series regression analysis since it helps to eliminate any possible serial correlation by adding lagged values of the dependent variable on the right hand side. The application of standard Granger causality test requires the series of the variables to be non-stationary and their linear combination to be stationary. The Dickey- Fuller and Augmented Dickey Fuller (1979, 1981) tests are applied to the three series to examine the unit root and stationary properties of the variables. In a bi-variate framework, the first variable is used to cause the second variable in the Granger sense if the forecast for the second variable improves when lagged values of the first variable are taken into account. The Granger Causality Test follows the following procedures for different set of bi-variate series separately. A time series (X) is said to be Granger caused to another time series (Y) if the prediction error (FPE-final prediction error) of current Y declines by using the past values of X in addition to past values of Y. The Granger Causality Test can only be applied if a linear combination of two non-stationary variables is stationary. The standard Granger's Causality Test can only be specified as:

$$\Delta X_t = \alpha_1 + \sum_{i=1}^{n} \beta_{1i} \Delta X_{t-i} + \varepsilon_{1t} \quad \text{.....(1)}$$

$$\Delta X_t = \alpha_2 + \sum_{i=1}^{n} \beta_{1i} \Delta X_{t-i} + \sum_{j=1}^{m} \beta_{2j} \Delta Y_{t-j} + \varepsilon_{2t} \quad \text{.....(2)}$$

$$\Delta Y_t = \alpha_3 + \sum_{i=1}^{n} \beta_{3i} \Delta Y_{t-i} + \varepsilon_{3t} \quad \text{.....(3)}$$

$$\Delta Y_t = \alpha_4 + \sum_{i=1}^{n} \beta_{3i} \Delta Y_{t-i} + \sum_{j=1}^{m} \beta_{4j} \Delta X_{t-j} + \varepsilon_{4t} \quad \text{.....(4)}$$

Where Δ refers to the difference operator and n is the number of lags, all α_i and β_i are the parameters to be estimated and ε_t is the error terms. Equation (1) and (2) are made as a pair to detect whether the coefficients of the past lags Y can be zero as a whole. Similarly, equations (3) and (4) are made as a pair to detect whether the coefficients of the past lags of X can be zero as a whole. If the estimated lagged values of Y variable in equation (2) is significant, then Y is said to be Granger cause X. Further if the estimated F-statistics for lagged values of X variable in equation (4) is statistically significant, then X is said to be Granger

caused Y. This setting forms the basic framework for Granger Causality (Engle and Granger 1987). It is important to note that the results of the causality test depend critically on the choice of the lag length. More often the choice of the lag length is done in an ad hoc manner. More specifically, too short a lag length results in estimation bias, while too long a lag length causes a loss of degree of freedom and estimation efficiency. To solve the problem, Hsiao's approach (1982) can be applied. Hsiao's (1982) procedure combines Akaike's final prediction error (FPE) criterion with Granger causality and is employed to guide the selection of the appropriate lag length of the independent variables. The estimation of FPE is a two-step procedure. The first step is to estimate equation (1) by varying its order of lags from 1 to m. Next we calculate the residual sum of squares (RSS) and FPE defined by Akaike's (1973) at each lag length of the independent variables. The lag that minimizes the following FPE values is considered as appropriate. The FPE at m lag is estimated by the following equation:

$$FPE(m, 0) = (T + m + 1) / (T - m - 1).\ RSS(m, 0)/ T \quad \ldots\ldots (5)$$

Where T=Number of observations, m= optimal order of lag of X, RSS=Residual sum of squares.

In the next step, we estimate equation (2) where Y is treated as control variable holding the optimal lag of X as m and the additional variable X is treated as manipulated variable varying its order of lags from 1to n and calculate the corresponding two dimensional FPEs by using the following equation (6):

$$FPE(m, n) = (T + m + n + 1) / (T - m - n - 1).\ RSS(m, n)/ T \quad \ldots\ldots (6)$$

Where T=Number of observations, m= optimal order of lag of X, n= optimum order of lag of Y, RSS=Residual sum of squares.

Here, also the minimum FPE determines the optimum lag of Y. After the determination of optimum lag, we can test for the direction of causality by comparing with the smallest FPEs. If the minimum FPE calculated from equation (6) is smaller than that of (5), then we can say X causes Y. Using the same procedure, we can find the subsequent causality from Y to X.

To test for Granger causality between 1) PCNSDP & IMR, 2) IMR & PCHE and 3) PCNSDP and PCHE, 5-bivariate models are specified as (arrows implies cause):

1. Does income cause health status? [PCNSDP → IMR?]
2. Does health status cause income? [IMR → PCNSDP?]
3. Does health expenditure cause health status? [PCHE → IMR?]
4. Does income cause health expenditure? [PCNSDP → PCHE?]
5. Does health expenditure cause income? [PCHE → PCNSDP?]

The reverse causality of question number 3 is not carried out; it is assumed that IMR cannot cause health expenditure.

6. ACHIEVEMENT INDEX OF HEALTH STATUS, HEALTH EXPENDITURE AND INCOME ACROSS THE STATES IN INDIA DURING 1980-81 TO 2005-06

At first, we consider the following formulae, after that we formulate a modified one, which will be used in measuring the progress of relative achievement of the three dimensions (viz. positive health status, health expenditure and income).

$$Z_{ijt} = [\text{Actual } X_{ijt} - \text{Min.} X_{ijt}] / [\text{Max} X_{ijt} - \text{Min.} X_{ijt}] \quad \ldots\ldots\ldots\ldots\ldots\ldots (A)$$

Where, Z represents 'achievement index' derived from dimension X. i represents states=1, 2……15 and j represents variable (or indicator) viz. health status, health expenditure and income=1, 2 and 3; t represents time=1981, 82……..2006. Here, for the sake of simplicity we consider two terminal points i.e., starting (1981) and ending (2006) with a view to capture the progress of the health status, health expenditure and income over a period of time. Formulae (A) is considered as an achievement index which is unweighted (UNDP 1990). This determines the relative distance measured in health status, health expenditure and income. Using these formulae, we calculate the relative distance measured in health progress, health expenditure and income by each state in two points of time (viz. 1980-81 and 2005-06).

The state specific achievement index of health status (taking the reciprocal of IMR), health expenditure and income (from 1980-81 to 2005-06) is shown in the following Table1. It is observed that in 1980-81 the achievement index of health status was minimum in Uttar Pradesh while that was maximum in Keralaz; but in 2005-06, the minimum was in Madhya Pradesh while maximum was in Kerala. The achievement index of healthcare expenditure is observed to be highest in Punjab while it was lowest in Bihar in both the two points of time. The same pattern was noticed in respect of NSDP with a marginal deviation that in 2005-06, the Punjab ranks second in respect of NSDP.

Table 1

Achievement Index of Health Status, Per Capita Health Expenditure and Per Capita Net State Domestic Product of 15 Major States in India in two points of time viz. 1980-81 and 2005-06.

States	Health Status*		Per Capita Health Expenditure		Per Capita NSDP	
	1980-81	2005-06	1980-81	2005-06	1980-81	2005-06
AP	0.245(5)	0.075(8)	0.511(9)	0.388(7)	0.263(9)	0.528(8)
Assam	0.137(9)	0.028(11)	0.168(13)	0.346(8)	0.208(12)	0.142(13)
Bihar	0.088(12)	0.054(10)	0(15)	0(15)	0(15)	0(15)
Gujrat	0.098(11)	0.092(7)	0.690(5)	0.404(5)	0.582(4)	0.770(5)
Haryana	0.161(8)	0.060(9)	0.661(7)	0.456(4)	0.826(3)	0.850(3)
Karnataka	0.382(2)	0.118(6)	0.504(10)	0.486(3)	0.343(6)	0.570(6)
Kerala	1(1)	1(1)	0.953(2)	0.791(2)	0.336(7)	0.458(9)
MP	0.019(14)	0(15)	0.277(12)	0.320(10)	0.250(10)	0.192(11)

Table 1 .....contd.

States	Health Status*		Per Capita Health Expenditure		Per Capita NSDP	
	1980-81	2005-06	1980-81	2005-06	1980-81	2005-06
Maharashtra	0.294(3)	0.250(3)	0.771(4)	0.393(6)	0.863(2)	1(1)
Orissa	0.039(13)	.003(14)	0.446(11)	0.258(13)	0.225(11)	0.161(12)
Punjab	0.279(4)	0.164(4)	1(1)	1(1)	1(1)	0.872(2)
Rajasthan	0.130(10)	0.027(12)	0.528(8)	0.294(11)	0.1735(14)	0.314(10)
Tamil Nadu	0.211(6)	0.238(2)	0.646(6)	0.334(9)	0.330(8)	0.541(7)
UP	0(15)	0.008(13)	0.049(14)	0.253(14)	0.205(13)	0.127(14)
WB	0.210(7)	0.226(4)	0.782(3)	0.276(12)	0.487(5)	0.772(4)

Note: * IMR itself represents a negative status of health but if we consider its reciprocal then it converts to positive status of health (Council for Social Development 2006, Santerre et al. 2000). In measuring the achievement index in respect of health status, the reciprocal of IMR was used. Within parentheses represents ranks.

During the last 26 years, almost all the states have experienced spectacular growth in health status, health expenditure and income, (if we consider the absolute value) but this growth is not identical rather tremendous heterogeneous progress was noticed. Now, how can we measure the progress keeping in mind the relative position of each state in respect of the three dimensions? For example, if we consider the simple method of measuring the growth rate [viz. $(y_1 - y_0)/y_0 \times 100$], then growth rate will be misleading because of higher (or lower) initial base values, this purely excludes the relative aspect of growth ignoring the range equalization method. If we want to measure the progress of achievement index in respect of each dimension over a long period of time, we need to modify our formulae (A). The achievement index of each dimension (derived by using the Range Equalization Process) ranks states relative to each other for a particular year. The maximum and the minimum values that define the maximum distance to be traveled for each dimension are specific to that year. Over time, the actual achieved values of each dimension changes, as will the maximum and minimum values of each dimension across all the states. Therefore, improvement in the achievement index of any state over time may be reflected as a decline in its value of any achievement index, if in the mean time its relative position has deteriorated. Thus, to combine a measure of progress over time with comparisons among the states the achievements index formulae (Eqn. A) has to be modified.

The way to tackle this problem, without changing the logic of the achievement index is to say that the minimum and maximum should be defined, not for each point of time, but over a period of time, using fixed goal posts. Thus, if we try to measure the progress of achievement index (of each dimension) between 1980-81 to 2005-06, the minimum would be minimum of all values of each dimension across the states over 26 years period; similarly for the maximum. Thus, equation (A) is modified as:

$$Z_{ijt} = \frac{[\text{Actual } X_{ijt} - \underset{i,t}{\text{Min}}\, X_{ijt}]}{[\underset{i,t}{\text{Max}}\, X_{ijt} - \underset{i,t}{\text{Min}}\, X_{ijt}]} \quad \ldots(B)$$

Using the modified formula as given in equation (B), the achievement index of three dimensions is calculated for the two time points (1980-81 and 2005-6) across the 15 states. The difference of the values of the two periods gives us the progress of achievement index of the three dimensions as given in Table2.

Table 2

Progress of Health Status, Per Capita Health Expenditure and Per Capita Net State Domestic Product of 15 Major States in India over the period of 1980-81 and 2005-06

States	Progress of AI of Health Status	Progress of AI of Health Expenditure	Progress of AI of Per Capita NSDP
A. P.	0.0911(11)	0.5745(5)	0.4768(7)
Assam	0.0818(15)	0.5697(7)	0.1403(13)
Bihar	0.1219(7)	0.3584(15)	0.0796(15)
Gujrat	0.1528(6)	0.5725(6)	0.5919(3)
Haryana	0.1034(9)	0.6081(4)	0.5831(4)
Karnataka	0.0864(13)	0.6377(3)	0.4890(6)
Kerala	0.6852(1)	0.8038(2)	0.3877(9)
M. P.	0.0942(10)	0.5462(9)	0.1723(11)
Maharashtra	0.2331(4)	0.5640(8)	0.7078(1)
Orissa	0.0910(12)	0.4949(13)	0.1518(12)
Punjab	0.1605(5)	0.9346(1)	0.5445(5)
Rajasthan	0.0849(14)	0.5131(12)	0.3105(10)
Tamil Nadu	0.2485(2)	0.5305(10)	0.4666(8)
U. P.	0.1080(8)	0.5176(11)	0.1279(14)
W. B,	0.2377(3)	0.4844(14)	0.6216(2)

Note: AI means Achievement Index. The achievement index of the three dimensions are calculated for the two time points (1980-81 and 2005-6) across the 15 states using eqn.(B). The difference of the values of the two periods gives us the progress of achievement index over the specified period. Number within parentheses represents rank.

In Table 2, we find that Kerala's progress is the highest in terms of health status while that is the lowest in Assam; Punjab occupies the highest position in terms of healthcare expenditure while the lowest progress is accorded in Bihar; Maharashtra stands first in terms of the progress of NSDP while that is the lowest in Bihar. Now, in order to understand intuitively the relationship between health status, health expenditure and income across the 15 states, we estimate the rank correlation coefficient only for two points of time 1980-81 and 2005-06, however, this analysis can also be done for the intermediate periods.

The simple rank correlation analysis suggests that there is a positive relationship between health status, health expenditure and income in both the two reference points of time. In order to understand the direction of causality, the following co-integration analysis is done.

Table 3

Rank Correlation Coefficient between Health Status, Health Expenditure and Income for the two periods 1980-81 and 2005-06

	1980-81			2005-06			
	Health Status	Health Expdt.	Income		Health Status	Health Expdt.	Income
Health Status	1	0.675**	0.611*	Health Status	1	0.592*	0.654**
Health Expdt.	0.675**	1	0.80**	Health Expdt.	0.592*	1	0.675*
Income	0.611*	0.80**	1	Income	0.654**	0.675*	1

Note: * 5% level of significance, ** 1% level of significance. N=15.

7. THE ANALYSIS OF THE RESULT

The study of Dickey – Fuller method of testing unit root with or without trend with respect to our data set (PCNSDP, IMR & PCHE) reveals the following: The details econometric analysis are not given here, however, the detailed values are available from authors if required.

a) The data series of PCNSDP & IMR of all states are non-stationary with or without trend except West Bengal and India in respect of PCNSDP.
b) The PCHE series are also non-stationary for all states except Maharastra, Punjab, Haryana, Tamilnadu and West Bengal without trend and are non-stationary except Maharastra, Haryana with trend.

To avoid the spurious regression problem that may arise from regression of a non stationary time series on another non stationary time series, we have to transform the non stationary time series to stationary time series that is we have to set regression of a unit root time series on another unit root time series. If the linear combination of two stochastic gives the residual with drift is stationary (having no unit root) then only we can go to the causal relation between variables. A number of methods for testing cointegration have been proposed in the literature. We consider here comparatively simple method, the DF and ADF unit root test on the residuals estimated from the co-integrating regression. In our analysis as ln(PCNSDP), ln(IMR) and ln(PCHE) are non stationary individually and the first difference of all three variables attain stationarity. The linear combination of any two (level or differenced) will be economically meaningful (not spurious) if the residual (ε_t) has no unit root i.e. the regression will be meaningful and they contain Long Term equilibrium relationship between them in each combination[6]. The non-stationarity of g, i and e explain the stationarity upon the first difference that means the co-integration between variables do exist. The result of unit root test of residuals and Akaike's FPE explains the dependency level of one individual non-stationary variable on other non-stationary variable with optimum lags. The lagged changes in g, i and e continue to be significant at 5% level for India as a whole and a number of states as shown in the following Tables 4, 5, 6, 7, 8 and 9.

Table 4

Granger causality test between PCNSDP and IMR: PCNSDP as dependent variable

State	FPE: Regress Δg at t on Δg at t-k	FPE: Regress Δg at t on Δg at t-k and Δi at t-j	Optimal lag of g	Optimal lag of i	F Value
Andhra	0.00266	0.00285	1	1	0.32267
Assam	0.005406	0.00594	3	1	2.007
Bihar	.0005348	0.05519	1	1	6.7633
Orrisa	0.005917	0.006371	2	1	4.4775
Maharastra	0.00234	0.00248	2	1	1.5506
M.P.	0.004061	0.004415	1	1	4.9648
Punjab	0.000317	0.000345	2	1	2.0460
Rajasthan	0.00859	0.007905	1	2	7.6968 *
Haryana	0.002495	0.002130	2	1	5.8577 *
Gujrat	0.010715	0.01068	1	1	4.2983*
Kerala	0.0018864	0.0018905	1	1	0.89866
Karnataka	0.001426	0.001182	1	1	6.2077 *
Tamilnadu	0.00122	0.00123	2	1	1.9326
U. P.	0.0009122	0.0008823	1	1	0.59495 *
West Bengal	0.000756	0.00038	1	4	4.9012 *
INDIA	0.00066208	0.00060315	3	2	2.4015 *

Note: g-ln (PCNSDP), i-ln (IMR) & e-ln (PCHE) ; k-Optimal lag period of Dependent variable, j-Optimum lag period of Independent Variable. FPE represents Akaike's final prediction error. * Significant at 5% level

Table 5

Granger causality test between PCNSDP and IMR: IMR as dependent variable

State	FPE: Regress Δi at t on Δi at t-k	FPE: Regress Δi at t on Δi at t-k and Δg at t-j	Optimal lag of i	Optimal lag of g	F Value
Andhra	0.002532	0.002188	2	2	3.453*
Assam	0.00721	0.00784	1	1	0.26063
Bihar	0.004905	0.005151	2	1	0.64560
Orrisa	0.002036	0.002115	1	1	0.50099
Maharastra	0.0059	0.005805	2	2	2.2725*
M.Pradesh	0.001331	0.0013656	2	1	3.6357
Panjab	0.003343	0.003349	3	1	2.1215
Rajsthan	0.006108	0.006495	1	1	0.86112
Haryana	0.0051117	0.005265	3	1	1.8075
Gujrat	0.0070697	0.007586	1	1	0.44558
Kerala	0.02541	0.031004	1	2	0.48291

Table 5

.....contd.

State	FPE: Regress Δi at t on Δi at t-k	FPE: Regress Δi at t on Δi at t-k and Δg at t-j	Optimal lag of i	Optimal lag of g	F Value
Karnataka	0.0051025	0.0048106	1	1	0.73191 *
Tamilnadu	0.00410	0.004206	1	1	0.57059
U. Pradesh	0.001576	0.001214	2	1	4.1318 *
West Bengal	0.004737	0.004413	1	1	4.5561 *
INDIA	0.0001213	0.001214	3	1	1.3603

Note: g=ln (PCNSDP), i=ln(IMR) & e=ln (PCHE) ; k=Optimal lag period of Dependent variable, j=Optimum lag period of Independent Variable. FPE represents Akaike's final prediction error. * Significant at 5% level

Table 6

Granger causality test between HE and IMR: IMR as dependent variable

State	FPE: Regress Δi at t on Δi at t-k	FPE: Regress Δi at t on Δi at t-k and Δe at t-j	Optimal lag of i	Optimal lag of e	F Value
Andhra	0.002532	0.002742	2	1	1.1975
Assam	0.00721	0.00761	1	2	1.2027
Bihar	0.004905	0.004724	2	2	1.4190*
Orrisa	0.002036	0.002172	1	3	0.91050
Maharastra	0.0059	0.00644	2	1	1.5149
M.P.	0.001331	0.00108	2	2	5.3000*
Punjab	0.003343	0.003668	3	1	1.5664
Rajasthan	0.006108	0.005505	1	1	2.9034 *
Haryana	0.0051117	0.0046356	3	1	2.6309 *
Gujrat	0.0070697	0.0074003	1	1	0.72037
Kerala	0.02541	0.02763	1	1	0.89456
Karnataka	0.0051025	0.005099	1	1	1.2977 *
Tamilnadu	0.00410	0.004171	1	1	0.83907
U. Pradesh	0.001576	0.001337	2	1	3.7381 *
West Bengal	0.004737	0.005152	1	1	2.6142
INDIA	0.0001313	0.000121	3	1	1.93833*

Note: g=ln (PCNSDP), i=ln(IMR) & e=ln (PCHE) ; k=Optimal lag period of Dependent variable, j=Optimum lag period of Independent Variable. FPE represents Akaike's final prediction error. * Significant at 5% level

Table 7

Granger causality test between PCNSDP and HE: PCNSDP as dependent variable

State	FPE: Regress Δg at t on Δg at t-k	FPE: Regress Δg at t on Δg at t-k and Δe at t-j	Optimal lag of g	Optimal lag of e	F Value
Andhra	0.00266387	0.0027181	1	1	0.86150
Assam	0.000540629	0.00041282	3	1	2.4266 *
Bihar	0.0053487	0.0057445	1	1	6.0883
Orrisa	0.00674276	0.005819566	1	1	4.0072 *
Maharastra	0.00234074	0.00215485	2	1	1.5379 *
M.Pradesh	0.00406132	0.0044094	1	1	4.9859
Punjab	0.00031772	0.00030745	2	1	1.8160 *
Rajasthan	0.00859428	0.008557826	1	2	7.0560 *
Haryana	0.00249509	0.00204898	2	3	4.4308 *
Gujrat	0.010715	0.010088	1	1	5.1783 *
Kerala	0.001886477	0.0015855	1	1	3.0918 *
Karnataka	0.001426159	0.001469142	1	1	2.3834
Tamilnadu	0.00122878	0.001138885	2	2	2.5085 *
U. Pradesh	0.00104797	0.001034839	1	1	0.76463 *
West	0.000756019	0.00069589	1	1	2.6266 *
INDIA	0.00662080	0.007004705	3	1	1.3483

Note: g-ln (PCNSDP), i-ln(IMR) & e-ln (PCHE) ; k-Optimal lag period of Dependent variable, j-Optimum lag period of Independent Variable. FPE represents Akaike's final prediction error. * Significant at 5% level

Table 8

Granger causality test between PCNSDP and HE: HE as dependent variable

State	FPE: Regress Δe at t on Δe at t-k	FPE: Regress Δe at t on Δe at t-k and Δg at t-j	Optimal lag of e	Optimal lag of g	F Value
Andhra	0.011108	0.00747828	1	4	4.5816 *
Assam	0.003981	0.0032479	3	1	3.5552 *
Bihar	0.059455	0.0629035	1	1	2.6863
Orrisa	0.00217218	0.00263849	1	2	2.8500
Maharastra	0.0033189	0.00214258	2	2	7.5594 *
M.Pradesh	0.00725343	0.007468416	2	1	1.1019
Punjab	0.004912248	0.00479698	2	1	1.1189 *
Rajasthan	0.002759939	0.00269630	1	1	7.7001 *
Haryana	0.0111766	0.01112008	2	1	1.7511 *
Gujrat	0.0087848	0.0093284	1	1	2.5330

Table 8 .....Contd.

State	FPE: Regress Δe at t on Δe at t-k	FPE: Regress Δe at t on Δe at t-k and Δg at t-j	Optimal lag of e	Optimal lag of g	F Value
Kerala	0.002367378	0.0021180	1	2	3.5179 *
Karnataka	0.00340309	0.00350913	1	3	4.5294
Tamilnadu	0.00444633	0.00434525	2	1	2.3064 *
U. Pradesh	0.00604303	0.00639964	1	1	0.76588
West Bengal	0.00128726	0.000998719	3	1	4.4326 *
INDIA	0.00319923	0.0034799	1	1	3.2200

Note: g=ln (PCNSDP), i=ln(IMR) & e=ln (PCHE) ; k=Optimal lag period of Dependent variable, j=Optimum lag period of Independent Variable. † FPE represents Akaike's final prediction error. * Significant at 5% level.

THE CAUSALITY:

The study of co-integration indicates only a long run equilibrium relation between the variables in each set of variable but it does not indicate the direction of causality. Co-integration result just rules out the possibility of 'no causation between variables'. Therefore, we have to use the Granger causality test (as discussed in the methodology) to establish the direction of causality. Direction of causality in the bi-variate model is determined from Table:4 to 8. Basically, Table:9 is drawn from the results of the direction of bi-variate causality by comparing columns 2 and 3 and the corresponding F value (given in column 6) in each of Table:4 to Table:8. It needs to be mentioned here that the following causality results are based on joint hypotheses tests, which do not allow the researchers to comment on the magnitude of the individual coefficients of each relevant variable. The only magnitude that one can comment on is the magnitudes of the F statistics alone. One possible solution to this problem could be introduction of the Vector Error Correction (VEC) method, which would allow a dynamic causal interpretation with a short-run and long-run connotation in the results. This method, however, applies to non-stationary data series, which are cointegrated.

But the present exercise looks at growth of the variables; VEC could not be an option. Moreover, this methodology is also based on a joint hypotheses test and would not allow interpretation of magnitudes of individual variables.

Table: 9
Results of the Bi-variate Granger Causality

Direction of Causality	Name of the States
Income Causes Health Expenditure	A.P., Assam, Maharashtra, Punjab, Rajasthan, Haryana, Kerala, Tamil Nadu, W.B.
Health Expenditure causes Income	Assam, Orissa, Maharashtra, Punjab, Rajasthan, Haryana, Gujrat, Kerala, T. N., U.P. and W. B.
Income causes Health Status$	Andhrapradesh, Maharashtra, Karnataka, Uttar Pradesh, West Bengal
Health Status$ causes Income	Rajasthan, Haryana, Gujrat, Karnataka, Uttar Pradesh, West Bengal and INDIA
Health Expenditure$ causes Health Status$	Bihar, Madhya Pradesh, Rajasthan, Haryana, Karnataka, Uttar Pradesh and INDIA

Source: Table 3 to 8. Note: If the value of Akaike's FPE of column 3 is minimum compared to FPE of column 2. and the corresponding F value is significant, then concerned explanatory variable truly being treated as 'cause'. All variables are measured in growth terms. $ Improvement of health status is measured by the decline of IMR.

8. CONCLUDING OBSERVATION

In this paper, the relationship between IMR, health expenditure and economic growth has been analyzed in a bi-variate framework using Granger causality tool at the state level using longitudinal data for 26 years. According to the existing literature, there is a large amount of evidence for human capital expenditure, particularly on health having a significant contribution to economic growth. The present study supports these hypotheses. The relationship holds good in the states of Assam, Orissa, Maharashtra, Punjab, Rajasthan, Haryana, Gujrat, Kerala, Tamil Nadu, Uttar Pradesh and West Bengal; similarly, the income growth also leads to health care expenditure except Orissa and Uttar Pradesh.

Both way causality between income and IMR is observed in the states of Karnataka, UP and West Bengal; one way causality i.e., income causing IMR holds good in the states of Andhrapradesh, Maharashtra while the reverse causality is found in the states of Rajasthan, Haryana, Gujrat and INDIA (see table no. 9).

A long run relationship does exist between IMR and health expenditure; health expenditure affects the IMR, which holds good in the states of Bihar, Madhya Pradesh, Rajasthan, Haryana, Karnataka, Uttar Pradesh and INDIA as a whole. Except Karnataka and Haryana, all states belong to BIMARU, which are socio-economically backward. One plausible explanation is that people in the BIMARU states largely depend on publicly provided health facility. The result could be different if the private spending on healthcare is incorporated into our analysis but the relevant data are unavailable. More public spending on health, medical and family welfare is required in order to get rid of the problem of health poverty trap. Why the desired causality does hold well in some of the states is not examined here. This invites further research in this context. Urbanization, fertility, cohort size of the aged population, poverty, private healthcare infrastructure etc. affect or are being affected by the variables considered so far in our analysis. Thus, it could be better if one carries out the task in a multivariate framework; this is beyond the scope of the present exercise.

Foot Notes:

a. BIMARU states in India imply Bihar, Madhya Pradesh, and Rajasthan & U.P.

1. Good health and nutrition enhance worker productivity. Healthier people who live longer have stronger incentives to invest in developing their skills, because they expect to reap the benefits of such investments over longer periods. Better health increases workforce productivity by reducing incapacity, debility, number of days lost to sick leave. Moreover, good health helps to forge improved levels of education by increasing levels of schooling and scholastic performance [Schultz 1997]. Health affects economic growth through its impact on demographic factors. Shorter life expectancies inhibit investment in education and other forms of human capital, since there is greater risk that each individual will not survive long enough to benefit from investment. In addition, a larger proportion of the population which is dependent has a detrimental effect on rates of savings and capital investment and hence on subsequent growth [Kelly and Schmidt 1996]. Healthier workers are more productive for a variety of reasons –

increased vigor, strength, attentiveness, stamina, creativity and so forth. Ill health and malnutrition reduce the physical capacity of the laborer, leading to lower productivity resulting in lower wages (Zimmer et al 2000).

2. Adriaan v. Zon and J. Muysken (2005) have argued that economic growth is driven by knowledge accumulation in the traditional Lucas Model (1988) and as such is based on labor services supplied by healthy people. The health state of the population at the aggregate level (the share of healthy people in the population) determines the extent to which potential labor services embodied in the population can be used effectively. Moreover, knowledge accumulation requires the spending of 'healthy hours', wherein the embodiment of knowledge can take hold in individual people.
3. Socio-economic status can be measured in many ways including occupation, social class, education, income and wealth etc. Adams et al (2003) have used 19 health conditions such as cancer, heart attack, and self rated health (the process through which one can express whether his/ her present health condition good or bad rated as 0/1) to explain wealth change; and wealth, income and education to explain mortality and incidence of 19 health conditions. Their findings did not reject the null hypotheses of no causal link from socio-economic status to mortality. They observed some statistical evidence for a causal link from health to changes in socio-economic status as measured by wealth change.
4. a) The relationship between health expenditure and income is found to be positive and health expenditure is dependent on the country's national income [Newhouse 1977, Gerdtham et al 2000, Hitris et al 1992, Hansen et al 1996, Karatzas 2000].
   b) Reddy and Selvaraju (1994) have used the OLS and obtained that 95.4 percent of the variation in average health care spending (of the major Indian states) can be explained by the variation in real per capita income and the income elasticity is estimated at 1.214. They have carried out a similar exercise for each individual state over the same time span and found that the income elasticity of health expenditure exceed one.
   c) Time series analysis divided mainly into additive model and multiplicative model and as multiplicative model has lots of advantages over additive model researchers prefer multiplicative models. Multiplicative models can be converted into additive model by taking logarithm if required.
5. Bhat and Jain (2006) have employed panel co-integration technique for finding out observed relationship between per-capita public health care expenditure and per capita gross domestic product for 14 major states and have obtained different values of income elasticity of health expenditure for different status. For example, income elasticity is estimated to be positive and less than one in all states except Uttar Pradesh and Assam. Punjab exhibits highest (0.93) and UP exhibits lowest (-2.36) values. The analysis gives a perplexing result, which augments the debate whether health is a necessity or a luxury.
6. Tables illustrating Unit Root Test (with and without trends) and results pertaining to the Unit Root Test of the Residuals are available from the authors.

REFERENCES

Adams, P., Michael, D. H.., Daniel, M., Merrill, A., and Ribeiro, T. (2003). Healthy, Wealthy, and Wise? Tests for Direct Causal Paths between Health and Socio-economic Status. *Journal of Econometrics,* 112, 3-56.

Adriaan V. Z., and Muysken, J. (2005). Health as a Principal Determinant of Economic Growth. *Health and Economic Growth: Findings and Policy Implications*,. Guillem Lopez-Casasnovas, Berta Rivera, and Luis Currais ed. The MIT Press, 41-65.

Akaike, H.(1973). *'Information Theory and an extension of the Maximum Likelihood Principle' in Procedings of the 2nd International Symposium on Information Theory*, B.N.Petrov and F. Csaki ed. Budapest, Akademiai Kiado, 267-281.

Archand, J. L. (2001). Undernourishment and Economic Growth. *The State of Food and Agriculture 2001* . Rome: Food and Agriculture Organization of the United Nations.

Arora, S. (1999). Health and Long-Term Economic Growth: A Multi-Country Study. *Ph.D Dissertation.* Ohio State University, USA.

Arora, S. (2001). Health Human Productivity and Long-Term Economic Growth. *Journal of Economic History,* 61(3), 699-749.

Barro, R.J. (1991). Economic Growth in a Cross Section of Countries. *Quarterly Journal of Economics,* 196(2nd May), 407-443.

Barro, R.J. (1997): *Determinants of Economic Growth*, Cambridge, Mass.: MIT Press.

Berkman, L. F. (1988)..The Changing and Heterogeneous Nature of Aging and Longevity: A Social and Biochemical Perspective. *Annual Review of gerontology and Geriatrics*, 8, ed. George L. Maddox and M. Powell Lawton, 37-68.

Bhargava, A., Jamison, D.T., Lau L. J., and Murray C. J. L. (2001). Modeling the effects of Health on Economic Growth. *Journal of Health Economics*, 20(3), 423-440.

Bhat, R., and Jain, N. (2006). Analysis of Public and Private Healthcare Expenditures. *Economic and Political Weekly,* XL1(1), January, 57-68.

Bloom, D.E., Canning, D., and Sevilla, E. J. (2001). The Effect of Health on Economic Growth: Theory and Evidence. *Cambridge: National Bureau of Economic Research, Working Paper* 8587, 26.

Bloom, D.E., and Williamson, J. (1998). Demographic Transitions and Economic Miracles in Emerging Asia, *World Bank Economic Review,* 12, 419-455.

Bloom, D. E., Sachs, J. D. (1998). Geography, Demography and Economic Growth in Africa. *Workings Papers on Economic Activity*, 2, 207-95.

Caselli, F., Esquivel, G.., and Lefort, F. (1996). Reopening the Convergence Debate: A New Look at the Cross-Country Growth Empirics. *Journal of Economic Growth*, 1, 363-389.

Chakrabarty, A., and Rao, D.N. (2005). Variation in Health Expenditures: Is it Just Income or Other Factors? Empirical Investigation Using a Panel of Indian States. *Journal of Quantitative Economics*, 3(2), 158-179.

Council for Social Development (2006). *India Social Development Report*, Oxford University Press, New Delhi, 216-224.

Deaton, A. (2003). Health, Inequality and Economic Development. *Journal of Economic Literature*, XLI (March), 113-158.

Deaton, A., and Christina, P. (2001). Mortality, Education, Income, and Inequality among American Cohorts. *Themes in the Economics of Aging*. David Wise (ed.), Chicago University Press for NBER, Paper 7140.

Dickey, D.A., and Fuller, W.A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, Part I, 74, 427-31.

Dickey, D.A., and Fuller, W.A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica*, 49, 1057-72.

Engle, R. and Granger, C. W. J. (1987). Cointegration and Error Correction: Representation, Estimation and Testing. *Econometrica*, 55, 251-276.

Feinstein, J. (1993). The Relationship between Socio-economic Status and Health: A Review of Literature. *Milbank Quarterly*, 71(2), 279-322.

Fogel, R.W. (1994). The Relevance of Malthus for the Study of Mortality Today: Long Run Influences on Health, Mortality, Labor Force Participation and Population Growth, Historical *Paper No.54, National Bureau of Economic Research*, March, 36 .

Fogel, R.W. (1997). New Findings on Secular Trends in Nutrition and Mortality: Some Implications for Population Theory. *The Handbook of Population and Family Economics, Vol.1A*. Edited by M. Rosenzweig and O. Stark. Amsterdam, North Holland.

Gallup, J., and Sachs, J. (2000). The Economic Burden of Malaria. *Working Paper No. 52, Centre for International Development, Harvard University*, Cambridge, Mass.

Gerdtham, U.G., and Lothgren, M. (2000). On Stationarity and Co-integration of International Health Expenditure and GNP. *Journal of Health Economics,* 19, 461-75.

Granger, C. (1981). Some Properties of Time Series Data and their use in Econometric Model Specification, *Journal of Econometrics,* 16, 121-130.

Gupta, I., and Mitra, A. (2001). Economic Growth, Health and Poverty: An Exploratory Study on India. *Background Paper, ICRIER,* New Delhi.

Paul, H., and Alan, K. (1996). The Determinants of Healthcare Expenditure: A Co-integration Approach. *Journal of Health Economics,* 15, 127-37.

Hitris, T., and Posnett, J. 1992). The Determinants and Effects of Health Expenditures in Developed Countries. *Journal of Health Economics,* 11, 173-81.

Hsiao, C. (1982). Auto-regressive Modelling and Causal Ordering of Economic Variables. *Journal of Economic Dynamics and Controlling,* 4, 243-259.

Hurd. M., and Kapteyn, A. (2003). Health, Wealth, and the Role of Institutions. *The Journal of Human Resources,* 38(2), 387-415.

Karatzas, G. (2000). On the Determination of the USA Aggregate Healthcare Expenditure. *Applied Economics* 32, 1085-99.

Kelly, A. C., and Robert M. S. (1996). Savings, Dependency and Development. *Journal of Population Economics,* 9(4), 365-86.

Lopez-Casasnovas, G., Berta R., and Luis C. (2005). The Role Health Plays in Economic Growth. *Health and Economic Growth: Findings and Policy Implications,* edited by Lopez-Casasnovas, G., Berta Rivera, MIT Press, MIT Cambridge, Massachusetts.

Lucas, R. E. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics,* 22, 3-42.

Mankiw, N.G., Romer, D., and Weil, D. (1992). A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics,* May, 407-37.

Mayer-Foulkes, D. (2001). The Long-Term Impact of Health on Economic Growth in Mexico, 1950-1995. *Journal of International Development,* 13(1), 123-126.

Mayer-Foulkes, D., Mora, H. R., Cermeno., A. B. B., and Duryea S. (2001). Health, Growth and Income Distribution in Latin America and the Caribbean: A Study of Determinants and Regional and Local Behavior. *Investment in Health, Social and Economic Returns,* PAHO Scientific and Technical Publication, 582, Washington D.C.

Marmot, M. G., Smith, G. D., Stansfeld, S., Patel,C., Fiona N., Head, J., White, I., Brunner, E., and Feeny, A.(1991). Health Inequalities among British Civil Servants. *The Whitehall II Study*, *Lancet*, June 8, 387-93.

Morand, O. F. (2005). Economic Growth, Health, and Longevity in the Very Long Term: Facts and Mechanisms. *Health and Economic Growth: Findings and Policy Implications*, edited by Guillem Lopez-Casasnovas, Berta Rivera, and Luis Currais, The MIT Press, 239-254.

Newhouse, J.P. (1977). Medicine Expenditure: A Cross National Survey. *Journal of Human Resources*, 12, 15-25.

Reddy, K. N. and Selvaraju, V. (1994). *Health Care Expenditures by Government in India* 1974-75 to 1990-91, Seven Hills Publication, New Delhi, India.

Romer, P. (1986). Increasing Returns and Long-Run Growth, *Journal of Political Economy*, 94 (5), 1002-1037.

Rosen, G. (1993). *A History of Public Health*, Baltimore, John Hopkins University Press.

Sachs, J., and Warner, A. (1997). Fundamental Sources of Long-Run Growth, *American Economic Review* (Papers and Proceedings) 87, 184-188.

Santerre, R.E., and Neun, S.P. (2000). *Health Economics: Theories, Insights and Industry Studies*, The Dryden Press, Harcourt Brace College Publishers, USA, 51-59.

Schultz, T.P. (1997). Assessing the Productive Benefits of Nutrition and Health: An Integrated Human Capital Approach. *Journal of Econometrics*, 77(1), 141-158.

Stark, O. (1995). *Altruism and Beyond: An Economic Analysis of Transfers and Exchanges within Families and Groups*, Cambridge University Press.

Thomas, D. and Strauss, J. (1997). Health and Wages: Evidence on Men and Women in Urban Brazil. *Journal of Econometrics*, 77.

UN (2003). *World Development Report 2003*, United Nations, New York.

UNDP (1990): *Human Development Report*, Technical Note 1, World Bank, Washington DC.

Weil, D.N. (2001). Accounting for the Effect of Health on Economic Growth, *Unpublished Paper.*

Wooldridge, J.M.(2000). *Introductory Econometrics: A Modern Approach*, South –Western College Publication, United States.

World Health Organization (1997). *Health Situation in South-East Asia Region. 1994-97*, New Delhi.

World Health Organization (2001): Macroeconomics and Health: Investing in Health for Economic Development, *Report of the Commission on Macroeconomics and Health, Geneva: WHO*, 1-213.

World Health Report (2000). *Public-Private Partnerships and Health.* Background Paper, Washington, DC.

Zimmer, Z., Natividad, J., Lin, H. S., and Chayovan, N. (2000). A Cross National Examination of the Determinants of Self-assessed Health. *Journal of Health and Social Behaviour*, 41(December), 465-481.

Journal of
Business and Economic Issues
Vol. 1 No. 2 July 2009

Information Asymmetry and Small Firm Finance: Credit Scoring as a Technology

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ABSTRACT: The paper is a genuine effort to analyse the problems relating to the acquisition of external finance by the SMEs. One of the major problems is information opacity which makes it an interesting area for study. We have tried to study the prevailing measures against the problem with special focus on Credit scoring. It has been observed that the technology of Credit scoring is still to gain momentum in India. We have studied as to how far Credit rating has been a substitute for Credit scoring and the benefits and challenges of Credit scoring. We have inferred that in the present scenario of small business in India the technology of Credit scoring, though more scientific, is still not as suitable as is in the western countries. Keeping in view the benefits of Credit scoring we prescribe the banks engaged in small firm financing to indulge in Credit scoring technique of SME financing.

Key Words: *SME, Information asymmetry, Credit scoring*

1. INTRODUCTION

Small and medium enterprises (SMEs) are the engines of growth in developing and transition economies like India. They play a significant role in terms of balanced and sustainable growth and employment generation. A belated realisation of the importance of SMEs to national economies has resulted in a large increase in academic literature on SME financing in the past two decades. As per findings of the third census on SSI, the total SSI

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sector (registered and unregistered units) in India comprised 1,05,21,190 units, out of which over 44 lakhs (42.26 per cent) were SSIs and the remaining 61 lakhs (57.74 per cent) were SSSBEs[1]. FY 2007 recorded 12.8 million SMEs in India contributing to an employment generation of 31.25 million[2] of the country. The production experienced a growth rate of around 18% in FY 2007 as against 15.8% in FY 2006, thereby raising its share to India's GDP up to15.5%[3] during the year 2007. Economic activities such as export market, growing domestic consumption, conducive policy measures, improving production methods, technology, development of SME clusters have fuelled production and hence their share to India's GDP. SMEs constituted an important segment of India's industrial production with a contribution to 33% [4]of its exports in FY 2006.

Rapid globalization and the WTO commitments brought in new challenges and threats for the SME sector. Threats being many our paper tries to focus on the major issue of financing. Lack of access to finance puts sustainability and viability of SMEs under question. Small business borrowers tend to be more informationally opaque than the larger ones and thus pose greater challenges for lenders.

2. SURVEY OF LITERATURE

Information asymmetry as discussed in Myers (1984) and Myers and Majluf (1984) arise from the separation of ownership and control, but this is not a feature for most small businesses. In small business, information asymmetry exists due to the lack of publicly available information. Asymmetric information between the borrower and the lender also represents a potential financing problem for small privately held firms as noted by Ang (1992) and Weinberg (1994). Small business lending is therefore a challenge to the Indian banking sector. To overcome the problems caused by information asymmetry the banks adhere to a variety of financial contracting tools[5] and employ an array of lending technologies. Statistical models are commonly used for evaluating the credit-worthiness of the firms. These include the linear probability model, logit model, probit models and linear discriminant analysis (Saunders, 2000). As early as 1995, only one large bank, Wells Fargo[6], had been able to generate a sufficiently large loan database to develop a reliable proprietary model (Acs 1999).

Various techniques of lending by banks have developed over time to address the problem of information asymmetry in lending to small business namely: financial statement lending, asset-based lending, credit-scoring and relationship lending where the first three can be clubbed together as transactions-based lending. Credit scoring is one of the most scientific method of financing small businesses. This technology though in use for quite some time in the underwriting of consumer loans, has only recently been routinely applied to commercial credits. This is because commercial loans were thought to be too heterogeneous and that documentation was not standardized either within or across institutions (Rutherford 1994, 1995).

3. CREDIT SCORING: AN INSTRUMENT USED IN SMALL FIRM LENDING

Due to the limiting factors of the first two lending technologies, lately credit worthiness of the entrepreneur, has begun gaining popularity as a better tool for SME lending. Thus, personal information is obtained from a credit bureau and then augmented with basic business-specific data to predict repayment. According to Feldman (1997), credit scoring will alter small business lending in three areas: (1) the interaction between borrowers and lenders; (2) loan pricing; and (3) credit availability.

'Credit Scoring' is the process by which banks assess the creditworthiness of a person applying for a loan. While scoring in this general sense has been around for a long time, credit scoring in the strict sense of the term is very nascent in India. The method produces a statistical "score" that a bank can use to predict the probability that a credit applicant will default or become delinquent. As stated by Berger and Frame (2007), credit scoring of a small business loan is one of a number of 'transactions lending technologies' for business credit based on 'hard' quantitative information[7] .

In the entire history of lending, some basic form of scoring has always been present. When banks had only a few customers "Individual Credit Analysis" was used to take lending decisions. In the modern day banking with a larger customer base it is practically not feasible for the banks to practice individual credit analysis. Thus judgmental models developed consisting of a set of predefined rules and standards for loan approvals. However, most banks in the advanced economies have moved beyond judgmental models to "Statistical Credit Scoring Model." The score considers the firm's payment history, outstanding debt and credit account history and transforms the information into a three digit number ranging between 300 and 900. Banks that use statistical credit scores set a cut-off score. All applicants with scores above the cut-off scores are approved and all applicants with scores below the cut-off are rejected. The higher the score, the lesser is the risk of the consumer going 91+ days overdue in the next year.

Different other types of credit scoring models are used for various activities. Application scoring models apply the bank's definition of good and bad accounts to identify and rank applicants. Behavioural scoring models are used to manage accounts, including credit line increases and decreases, over limits, and renewals. Collection scoring models may help determine accounts that are more likely to be collectible, and profitability scoring models are used to identify the most profitable marketing segments. Fraud detection and bankruptcy scoring models help identify accounts with possible fraudulent activity or borrowers likely to go bankrupt.

Several statistical methods are used to develop credit scoring systems, including linear probability models, logit models, probit models, and discriminant analysis models. The first three are standard statistical techniques for estimating the probability of default based on historical data on loan performance and characteristics of the borrower. Discriminant analysis

instead of estimating a borrower's probability of default divides borrowers into high and low default-risk classes. Two newer methods beginning to be used in estimating default probabilities include options pricing theory models and neural networks. These methods have the potential to be more useful in developing models for commercial loans, which tend to be more heterogeneous than consumer or mortgage loans, making the traditional statistical methods harder to apply.

4. CREDIT SCORING: THE INTERNATIONAL SCENE

In some developed markets, such as the U.S., Canada and Japan, lenders have joined together and shared data on their small business lending portfolios with a credit scoring firm – Fair Isaac Corporation of California – in order to develop a pooled data credit scoring tool. This tool has become an industry standard, providing better segmentation of the small business market and is more economical than a custom application designed only for one bank. The first banks to use scoring for small-business loans were larger banks of the United States that had enough historical loan data to build a reliable model; these banks include Hibernia Corporation, Wells Fargo, BankAmerica, Citicorp, NationsBank, Fleet, and Bank One. In Australia credit scoring, although not as mature in its application compared to the US, is widely accepted as the primary way applicant creditability is assessed. The system of credit reports and scores in Canada is similar to that in the United States, with the same three reporting agencies active in the country (Equifax, TransUnion, North Credit Bureaus). In the U.K. there is much academic research into credit scoring. The most popular statistical technique used is logistic regression to predict a binary outcome such as bad debt or no bad debt. Some banks also build regression models that predict the amount of bad debt a customer may incur. Here credit scoring is closely regulated by the Financial Services Authority.

5. CREDIT SCORING: INDIAN PERSPECTIVE

In recent years India has witnessed rapid growth in the Small and Medium Enterprises (SME) sector, and an enhanced appreciation of this sector's critical role in driving economic growth. This has put the 'supply-side' of finance to small business under extensive research. With many private and public sector banks directing resources and focus towards SME lending, the need has arisen for independent credit opinions. Weak laws allowing for the repossession of collateral, the lack of a fully developed credit bureau and the often misleading nature of tax statements raised the need for Indian banks to prescribe a statistical score to assess the repayment capability of the firm. However, small business credit scoring (SBCS) technologies though of eminence importance has still limited use in India. This is likely due to a variety of factors including poor lending practices, small market sizes and incentives for maintaining relatively labour intensive loan processing technologies rather than automating. Credit Information Bureau India Limited (CIBIL) is India's first credit information bureau and is a repository of factual information on the credit history and repayment records of commercial and consumer borrowers. State Bank of India (SBI), Housing Development Finance Corporation Limited (HDFC), Dun & Bradstreet Information Services India Private

Limited (D&B) and TransUnion International Inc. (TransUnion) signed Shareholders' Agreement on January 30, 2001, to establish the Credit Information Bureau (India) Limited (CIBIL). The mechanism of credit scoring by the Indian banks at present is restricted to the individual borrowers.

In a situation where credit scoring is yet to be introduced in the commercial forefront, government, in order to combat the risk of default by the small business in repaying loans to the providers, has designed *credit rating mechanism* jointly with Credit Rating Information Services of India Limited (CRISIL), IBA, Small Industries Development Bank of India (SIDBI)[8] and Small Scale Industries (SSI) Associations. SIDBI has developed a Credit Appraisal & Rating Tool (CART) as well as a Risk Assessment Model (RAM) for risk assessment of proposals for SMEs. The SME Rating Agency (SMERA) has been set up in August 2005 to develop an external rating facility for Small Businesses in India. Banks in India at present consider these ratings in deciding on the amount of loan and the rates of interest in lending SME units.

Banks like ICICI[9], HDFC though engaged in SME financing have not yet adopted the mechanism of credit scoring. Thus most of the lending by banks and financial institution to the small firms in India is guaranteed by the credit rating mechanism and lender-borrower relationship.

6. CREDIT SCORING IN WESTERN WORLD AND ITS DIFFERENCE WITH CRISIL

In the western hemisphere credit scores have been widely used for many years in consumer credit markets (e.g., mortgages, credit cards, and automobile credits). However, only in the mid-1990s did financial institutions begin to combine the consumer and business information to create scores for small business credits on a widespread basis. In March 1995, Fair, Isaac introduced its "Small Business Scoring Service (SBSS)," a scoring model that was developed with RMA, a trade association of commercial lenders. This was the first time that the scoring mechanism moved from consumer credit to commercial credit. The model was built using five years' worth of data on small-business loans from 17 banks in the United States, a sample of more than 5000 loan applications from businesses with gross sales of less than $5 million and loan face values up to $250,000; banks provided data on good and bad accounts and on declined applications, as well as credit reports on at least two of a the business (Asch, Hansell, and Neill and Danforth). Besides the largest providers of external models in the west, today, there are alternative external vendors in the commercial credit information business (e.g., Dun and Bradstreet, Experian).The scenario in the east specially in developing countries like India is somewhat different from that of the west, the reason being poor lending practices, small market sizes and incentives for maintaining relatively labour intensive loan processing technologies rather than automating etc. But scoring in a different form is prevalent in India. CRISIL's[10] ratings on small and medium enterprises (SMEs) reflect the rated entities' overall creditworthiness, adjudged in relation to other SMEs. These ratings are entity-specific, and not specific to debt issuances. The SME sector unlike the large corporate has no

organised information on industries, market shares, competition dynamics, and promoter or management track record. The creditworthiness of entities in the sector, therefore, needs to be assessed using tools and methods that are different from those traditionally used for large corporate. CRISIL has two separate scales on which it assigns ratings to SMEs: the NSIC[11] CRISIL Performance and Credit Rating (NSIC-CRISIL) scale for small scale industries (SSIs), and the CRISIL SME Rating scale.

The NSIC-CRISIL scale measures performance capability and financial strength as two distinct dimensions. Performance capability is measured on a five-point scale (from 1 to 5), and financial strength is measured in three categories (A to C). The rating symbolises the relative positioning of the rated entity adjudged in relation to other SSIs. Table 1 outlines the rating matrix of the NSIC-CRISIL scale:

Table 1

NSIC CRISIL Rating Matrix

PERFORMANCE CAPABILITY	FINANCIAL STRENGTH		
	High	Moderate	Low
Highest	SE1A	SE1B	SE1C
High	SE2A	SE2B	SE2C
Moderate	SE3A	SE3B	SE3C
Weak	SE4A	SE4B	SE4C
Poor	SE5A	SE5B	SE5C

CRISIL also offers SME Ratings to the larger domain of SMEs, of which SSIs are a subset. The SME Rating Scale is an eight-point scale (SME 1 to SME 8) that symbolises the rated entity's creditworthiness in relation to other SMEs. Table 2 outlines the CRISIL SME Rating Scale and rating definitions:

Table 2

CRISIL SME rating scale

CRISIL SME Rating	Definition
SME1	Highest
SME2	High
SME3	Above Average
SME4	Average
SME5	Below Average
SME6	Inadequate
SME7	Poor
SME8	Default

The rating methodology for assessment under both rating scales is the same. The methodology is comprehensive and covers three broad categories of risk – business risk, management risk, and financial risk.

7. BENEFITS OF CREDIT SCORING: QUICKER, CHEAPER, AND MORE OBJECTIVE

Credit Scoring has some obvious benefits that have led to its importance in loan evaluation. The time of processing a loan has reduced from two weeks with traditional technologies of lending to 12 ½ hours with the advent of Credit Scoring mechanism (Allen, 1995). With the savings in time there is a saving in cost which benefits both the bank and the borrower. Customers are required to provide only those information which are in the scoring system (Mester 1997) thereby making the applications shorter. Credit Scoring further ensures that the criteria for loan approval is the same for all borrowers regardless of race, gender, or other factors prohibited by law from being used in credit decisions.

8. CHALLENGES IN CREDIT SCORING

The accuracy of the scoring systems for underrepresented groups is still an open question. Inaccurate score leading to poor performing loans off-sets the advantage of cost savings. To assure accuracy the data need to be a rich sample of both well-performing and poorly performing loans. The data should be up to date, and the models should be re-estimated frequently. For the scorecard to produce an accurate score, the sample of the population used to create the model must be similar to the applicants that the model will score.

To avoid "selection bias" in the loan approval process, account should be taken not only of the characteristics of borrowers who were granted credit but also of those who were denied. However November 1996 Senior Loan Officer Opinion Survey showed that with all type of precautionary measures taken no scoring model can prevent errors of granting credit to those who will default and rejecting who could have repaid. A good model can only accurately predict the average performance of a loan.

Apart from the general limitations the model is also critisised in its application in small businesses as it is based on 'hard' quantitative information of the firm and its owner. The benefit of credit scoring technology is most of the time subdued by the problem of financial status disclosure by the firms and its owner.

Profit maximization being a priority of the lenders, credit score loans is likely to have less flexible terms. It has also been argued that the increasing use of credit scoring will affect small business lending in terms of the interaction between borrowers and lenders, loan pricing, and the availability of credit (Feldman 1997).

9. THE WAY FORWARD

This paper took off with the real life problem of information asymmetry in small firm finance whose one of the solution lies in the technology used in financing. In course of our discussion we came out with the various tools and techniques of financing, both traditional and modern. We inferred that sole use of relationship based lending or transaction based lending will be unsuitable for SMEs in the Indian context.

The paper has focused on the use of Credit Scoring (at present the most scientific method of assessing the credentials of borrower) in the western countries and its beneficial outcome in contrast to the rating process in India. Thus the paper goes to suggest the introduction of credit scoring technology in India. Keeping in view the Indian context the paper prescribes the use of a rational combination of both relationship lending and credit scoring technology by the banks in providing funds to the small firms. This will impose the SMEs to give proper attention towards its performance, at the same time reap benefit of lender-borrower relationship in acquiring finance. Adequate finance at proper time will help the small firms to grow and thus help in the economic growth of the country.

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[1] Small Scale Service & Business (Industry related) Enterprises.

[2] Source: Office of the Development Commissioner (MSME).

[3] Source: Ministry of Micro Small and Medium Enterprises, Government of India.

[4] Source: Ministry of Micro Small and Medium Enterprises, Government of India.

[5] Collaterals, guarantees, covenants, maturity and menu pricing.

[6] Wells Fargo is a diversified financial services company in the United States with operations around the world. Wells Fargo is the 5th largest bank in the US by assets and the 9th largest bank in the world by market cap.

[7] The other transactions technologies include financial statement lending, asset-based lending, factoring, and leasing.

[8] The Small Industries Development Bank of India (SIDBI) was set up in April 1990, as the principal financial institution for financing and development of SSIs and coordination of institutions engaged in similar activities.

[9] ICICI under the leadership of Principal Researcher: Professor Antoinette Schoar (MIT Sloan School of Management) and Research Associate: Doug Johnson has started researching on the use of credit scoring by Indian Banks in funding small business (since October 2006).

[10] Credit Rating Information Services of India Limited.

[11] National Small Industries Corporation.

REFERENCES

Acs, Z. A. (1999). The development and expansion of secondary markets for small business loans. In J. L. Blanton, A. Williams and S. L. W. Rhine (eds.), *Business Access to Capital and Credit.* A Federal Reserve System Research Conference, 625-643.

Allen, James C. A. (1995). Promise of Approvals in Minutes, Not Hours. *American Banke,* February 28, 23.

Ang, J. S. (1992). On the theory of financing for privately held firms. *Journal of Small business Financ,* 1(13), 185- 203.

Asch, L. (1995). How the RMA/Fair, Isaac Credit-Scoring Model Was Built. *Journal of Commercial Lending,* June, 10-16.

Berger, A. N. and Frame, W. S. (2007). On lending to small firms. *Journal of Small Business Management,* 45(1), 42–46.

Feldman, R. (1997). Small business loans, small banks and a big change in technology called credit scoring, Federal Reserve Bank of Minneapolis. *The Region,* September, 19-25.

Hansell, S. (1995). Need a Loan? Ask the Computer: 'Credit Scoring' Changes Small-Business Lending,. *New York Tim,* April 18, D1.

Mester, L. J. (1997). What's the point of credit scoring? *Business Review.* Federal Reserve Bank of Philadelphia, September/October, 3-16.

Myers, S. C. (1984). The Capital Structure Puzzle. *Journal of Finance,* 39(3), 575-592.

Myers, S. C. and Majluf, N.S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics,* 13(2), 187-221.

Neill, D. S., and John, P. D. (1996). Bank Merger Impact on Small Business Services Is Changing,. *Banking Policy Report,* The Secura Group, 18 (April 15), 1 & 13-19.

Rutherford, R., (1994, 1995). Securitizing small business loans: A banker's action plan, Commercial Lending Review, 10(1), 62-74.

Saunders, A. (2000). *Financial Institutions Management.* Boston, MA: Irwin Mc Graw Hill.

Journal of
Business and Economic Issues
Vol. 1 No. 2 July 2009

Role of Co-operative Bank in the Functioning of Self Help Groups: A Study Based on the District of Nadia, West Bengal

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ABSTRACT: According to the Planning Commission Report, the proportion of population below the poverty line in 1999-2000 in West Bengal was 31.85 per cent. Women in rural areas are commonly portrayed as among the most oppressed and majority of them are grounded in both poverty and patriarchy. Self Help Groups (SHGs) of women in West Bengal have been recognized as an effective strategy for the empowerment of women in rural as well as in urban areas. On the other hand, after the liberalization of Indian banking in 1990-91 the pressure on banks to be financially viable has been intense. This has resulted in banks turning their backs on rural India – shutting down rural branches and cutting off farmers' access to loans. Microcredit has now become the great white hope in the government attempts to get banks to lend more to rural India. Linking the SHGs to the banks has thus become a workable way of channelising micro credit to the poor. Co-operative sector still plays a major role in rural credit delivery. According to recent study by World Bank and National Council for Applied Economic Research, the Primary Agricultural Credit Societies (PACS) amount for about 30 per cent of micro credit in India. However, a large number of PACS are not functional and most of those which are functioning are not able to meet the credit requirements especially of the economically weaker sections. This paper attempts to analyse the role of Co-operative Bank in the functioning of SHGs.

Key Words: *Self Help Groups, Microcredit, Microfinance, Rural credit system.*

1. INTRODUCTION

The lack of access to credit for the poor is attributable to practical difficulties arising from the discrepancy between the mode of operation followed by financial institutions and the

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economic characteristics and financing needs of low-income households. For example, commercial lending institutions require that borrowers have a stable source of income out of which principal and interest can be paid back according to the agreed terms. However, the income of many self employed households is not stable, regardless of its size. A large number of small loans are needed to serve the poor, but lenders prefer dealing with large loans in small numbers to minimize administration costs. They also look for collateral with a clear title - which many low-income households do not have.

The Government of India has taken several initiatives to strengthen the institutional rural credit system. The rural branch network of commercial banks have been expanded and certain policy prescriptions imposed in order to ensure greater flow of credit to agriculture and other preferred sectors. Although these measures have helped in widening the access of rural households to institutional credit, vast majority of the rural poor have still not been covered.

NABARD is set up by the Government of India as a development bank with the mandate of facilitating credit flow for promotion and development of agriculture and integrated rural development. The mandate also covers supporting all other allied economic activities in rural areas, promoting sustainable rural development and ushering in prosperity in the rural areas.

The informal financial sources generally include funds available from family sources or local money lenders. The local money lenders charge exorbitant rates, generally ranging from 36% to 60% p.a. interest due to their monopoly in the absence of any other source of credit for non-conventional needs. Chit Funds is the other form of credit system operated by groups of people for their mutual benefit which however have their own limitations.

Lately, few of the NGOs engaged in activities related to community mobilisation for their socio-economic development have initiated savings and credit programmes for their target groups.

However, recent years have generated unprecedented interest in microcredit and microfinance in the form of group-lending without collateral. Self Help Groups (SHGs) of women in India have been recognized as an effective strategy for the empowerment of women in rural as well as urban areas, bringing women together from all spheres of life to fight for their rights. Since the overall empowerment of women is crucially dependent on economic empowerment, women through these SHGs work on a range of issues such as health, nutrition, agriculture, forestry, etc. besides income generation activities.

With this in the backdrop, the present paper makes an attempt to highlight the role of Co-operative Bank in the functioning of Self Help Groups supported by a study based on the district of Nadia, West Bengal. The paper is divided into six parts. The first part deals with introduction. The second part gives a conceptual idea regarding the Self Help Groups. The third part focuses on Nadia District Central Co-operative Bank. The linkage between SHGs

and Nadia DCCB has been discussed in the fourth part of the paper. The fifth part provides a analytical discussion and the last part offers conclusion.

2. AN INTRODUCTION TO SELF HELP GROUPS

Self Help Group is a group of few individuals – usually poor and often women – who pool their savings into a fund from which they can borrow as and when necessary. Self Help Groups (SHGs) form the basic constituent unit of the microfinance movement in India. Such a group is linked with a bank – a rural, co-operative or commercial bank– where they maintain a group account. Over time the bank begins to lend to the group as a unit, without collateral, relying on self-monitoring and peer pressure within the group for repayment of these loans.

An SHG consists of five to twenty persons, usually all from different families. Each such group has a leader and a deputy leader, elected by the group members. Often a group like this is given a name. The members decide among themselves the amount of deposit they have to make individually to the group account. The starting monthly individual deposit level is usually low – Rs. 10 to Rs. 50. For a group of size 10, this translates to Rs. 100 to 500 of group savings per month. On the basis of the resolutions adopted and signed by all members of the group, the manager of a Co-operative bank, rural or commercial bank opens a savings bank account. The savings are collected by a certain date from individual members and deposited in the bank account.

The groups perform as an institution to ensure mutual accountability. The individual borrowing member is kept in line by considerable pressure from other group members. Credibility of the entire group and future benefits in terms of new loans are in jeopardy if any one of the group members defaults on repayment.

Loans are then given out to individual members from out of these funds upon application and unanimous resolution drawn at a group meeting. The bank permits withdrawal from the group account on the basis of such resolutions. Such loans, fully funded out of the savings generated by the group members themselves, are called "inter-loans". The repayment periods of loans are usually short, 3-6 months. After regular loan issuance and repayment for six months, the bank considers making a bank loan to the SHG. The maximum loan amount is 2 to 4 times multiple of the total funds in the group account. Thus, a 10 member SHG with individual monthly deposit level of Rs. 50 each, completing a six-month successful "inter-loaning", accumulates total savings of Rs.3000/- and is eligible for a maximum bank loan of Rs. 12000/-.

3. NADIA DISTRICT CENTRAL CO-OPERATIVE BANK

The geographical boundary of Nadia district in West Bengal comprises Bangladesh in the East, Burdwan and Hoogly district on the West, Murshidabad district on the North and North West and North 24 Parganas district towards South and South East. Situated on the

main rail route connecting Howrah/Kolkata and New Jalpaiguri(NJP) including parts of North Eastern states, the Nadia district can easily be accessed by rail.

The nearest airport is Kolkata which lies between 100 kms to 160 kms from different parts of the district. The regional node and the district head Quarter Krishnagar is approximately 110 kms from Kolkata and easily accessible with regular bus service from Kolkata and North Bengal quite convenient for visitors. The district has good connectivity via waterways through rivers Bhagirathi.

Nadia District is an agriculturally developed District. The district has become self sufficient in agricultural production, especially in paddy and vegetables.

Nadia District Central Co-operative Bank Ltd, a district body, provides short-term and medium-term credit in the district through its affiliated societies. The Bank was formed on 24th February 1961 by an amalgamation of Nadia District Central Co-operative Bank, Ranaghat Bank and Nadia Central Co-operative Bank. The Bank started its business on 25th February 1961 and has been making progress since then. It has on 31st March 2008: 364 PACS, 185 Weavers Societies, 203 Employee Credit Societies and 140 other types of societies as its affiliated institutions through which credit is disbursed to individual members. Besides, it has 17 Branches in the district.

Table- 1

Agricultural Workers of Nadia District (1991 Census)

No. of Landless Labourers	387235
No. of Bargadars	64311
No. of Patta Holders	89865
No. of Small farmer families	73373
No. of Marginal farmer families	127605

Source: Official website of Nadia District

Table – 2

Demographic Figures of Nadia District

		1991 Census	2001 Census
Total population		3852097	46,03,756
	Male	1989840	23,65,054
	Female	1862256	22,38,702
Total Rural Population		2980279	
	Male	1544725	
	Female	1435554	
Total Urban Population		871818	
	Male	445116	
	Female	426702	

Contd.....

		1991 Census	2001 Census
Total S.C. Population		1117506	
	Male	579182	
	Female	538324	
Total S.T. Population		92525	
	Male	46324	
	Female	26201	
Density of. Population (per Sq. Km.)		981	1172
Sex Ratio		938 Females	947

Source: Official website of Nadia District

4. SHGs AND NADIA DCCB LINKAGE (2007-08)

Involvement of SHGs with banks could help in overcoming the problem of high transaction costs in providing credit to the poor, by passing on some banking responsibilities regarding loan appraisal, follow-up and recovery etc .to the poor themselves. In addition, the character of SHGs and their relations with members offered ways of overcoming the problem of collateral, excessive documentation and physical access which reduced the capacity of formal institutions to serve the poor.

Two important objectives of the SHGs and Nadia DCCB linkage programme could be:

a. to evolve supplementary credit strategies for meeting the credit needs of the poor by combining the flexibility, sensitivity and responsiveness of the informal credit system with the strength of technical and administrative capabilities and financial resources of the formal financial institutions.

b. to build mutual trust and confidence between bankers and the rural poor.

Table 3

Nadia District Central Co-operative Bank Ltd. Lending Pattern (Rs. in Lakhs)

Sl. No.	Types of Lending	Interest Rate %	2004-05 Investment	2004-05 Interest Received & Receivable	2005-06 Investment	2005-06 Interest Received & Receivables	2006-07 Investment	2006-07 Interest Received & Receivables
1.	Short-Term Agriculture	7.5	1807.32	132.61	1629.73	77.96	1598.81	47.29
	Medium- Term :ulture	10	177.41	14.57	136.99	21.27	132.78	7.12
	Short-Term Agriculture Kisan	7.5	2564.78	186.62	3803.2	245.41	4493.69	111.6
	Self-Help Group	8	139.31	9.46	295.3	6.49	386.72	8.82
	TOTAL		4688.82	343.26	5865.22	351.13	6612	174.83

Source: Annual Reports of Nadia DCCB

Note: Above table shows that there is an increasing trend of investment by the Bank to the SHGs. It has been increased by 188.42% from the year 2004-05 to 2006-07.

Table 4

NADIA DISTRICT CENTRAL CO-OPERATIVE BANK
ISSUE AND COLLECTION OF LOAN (Rs. In Lakhs)

		2004-05			2005-06			2006-07		
Sl. No.	Types of Lending	Issue	Collection	outstanding	Issue	Collection	outstanding	Issue	Collection	outstanding
1.	Short-Term Agriculture	nil	794.67	1810.63	nil	180.9	1629.73	nil	30.92	1598.81
2.	Medium-Term Agriculture	33.16	101.32	177.41	12.58	53	136.99	7.93	12.14	132.78
3.	Short-Term Agriculture Kisan Credit	3375.73	1622.18	2564.78	4992	3753.58	3803.2	4578.34	3887.86	4493.68
4.	Self-Help Group	138.42	76.35	136	362.42	203.12	295.3	257.99	166.57	386.72
5.	TOTAL	3547.31	2594.52	4688.82	5367	4190.6	5865.22	4844.26	4097.49	6611.99

Note: From the above table it is clear that there is a mixed result in the issue, collection and outstanding balance of loan to Self Help Groups.

Following are the important information collected from the Nadia DCCB regarding SHGs and Bank linkage:

a. Upto 31.03.2008 there are 12,164 Self Help Groups formed through 202 Co-operative Societies in the district of Nadia.

b. 1, 12,692 poor people are associated with these Groups.

c. 94,693 poor women are associated with these Groups.

d. Total amount of Loan disbursed by the Bank to those SHGs is Rs. 602.93 Lakhs and outstanding balance Rs. 675.26 Lakhs.

e. Bank demand (matured) Rs. 437.35 Lakhs and repayment Rs. 403.95 Lakhs (92.36 %).

f. 60 Workshops and Training Programmes have been conducted by the Bank during the financial year 2007-08.

5. FINDINGS

Analysing the financial data provided by the bank, it was found that total deposit of the Nadia DCCB has been increased remarkably. Credit disbursement has also been increased from Rs. 1438.51 lakhs in the year 2002-03 to Rs. 5784.22 lakhs in the year 2006-07 i.e. more than 300 % increased in three years.

Credit recovery percentage is satisfactory in 2006-07 i.e. 72.88 %.

Upto 31.03.08 number of SHGs formed through the Bank was 12164, whereas it was 7634 in 2005-06 and 9572 in 2006-07. So, number of SHGs has been increased 59.33 % in two years. Since 2592 new SHGs were formed in 2007-08 (90 % of which were female members group), it indicates the positive and efficient managerial functions of the Bank.

Investment in SHGs has been increased from Rs. 139.31 lakhs in 2004-05 to Rs. 386.72 lakhs in 2006-07 (i.e.177.59% increased).

On the other hand, outstanding loan balance has been increased from Rs. 136 lakhs in 2004-05 to Rs. 386.72 lakhs in 2006-07 (i.e. 184.35 % increased). Necessary steps to be taken to reduce the outstanding balance.

The rate of growth in Bank Deposit is not satisfactory.

Net profit of the Bank has shown an upward trend in 2007-08 in comparison to 2006-07 (i.e. from Rs. 6.33 lakhs to Rs. 27.95 lakhs) but the balance of NPA is very high in 2007-08 (Rs. 916.54 lakhs). Proper steps are to be taken to reduce the balance of NPA.

Interest rates of Loan to SHG (2007-08)

1. District Central Co-operative Bank (DCCB) to Primary Agricultural Credit Societies (PACS): 11.25% p.a.
2. PACS to SHGs : 13.25% p.a.

Data have been collected from five Co-operative Societies financed and managed by Nadia DCCB through Haringhata Branch. All the members of SHGs interviewed were attached with those Societies. There are 13 Societies in Haringhata Block.

TABLE 5
CO-OPERATIVE SOCIETIES UNDER HARINGHATA BRANCH (as on 31.03.2008)

Sl No.	Name of the Societies	No. of SHGs	Credit link SHGs	Deposit (Rs in Lakhs)
1.	Birohi		56	4.92
2.	Barasat Duttapara	105	71	12.13
3.	Kastodanga Gram	465	370	29.78
4.	Kastodanga Purbachal	82	32	4.38
5.	Nagarukhra	185	15	9.04
6.	Panpur	299	170	23.16
7.	Uttar Brahmapur	84	75	8.38
8.	Sath Simulia	53	14	0.84
9.	Haringhata CADP	353	271	20.75
10.	Fatepur	203	138	16.43
11.	Mollabelia	54	23	0.89
12.	Tri Gram	51	8	1.04
13.	Malidanga	Nil	Nil	N.A.
	TOTAL	2042	1243	131.74

Source: Haringhata Branch

The study covered different villages in the Haringhata Panchyat Samiti of Nadia District.

Following table shows group details of few SHGs of Panpur SKUS. Members profession mainly – Farming, Dairy, Basket-making etc. in Panpur SKUS.

TABLE – 6

PANPUR (SKUS) SOCIETY - GROUP DETAILS

(as on 31.03.2008)

Sl. No.	Name of SHGs	No. of Members	Name of President	Contribution	Deposit (Rs.)
1.	Jaiguru	7	Kalpana Mondal	25	21273
2.	Swarnamoi	6	Najma Bibi	20	2536
3.	Mahamaya	8	RatnaRani Biswas	50	34058
4.	Beauty	9	Kalpana Das	50	5563
5.	Annapurna	7	Namita Biswas	30	17284
6.	Rokeya	8	Najma Khatun	50	24572
7.	Deepsikha	6	Manju Biswas	50	10992
8.	Saraswati	7	Kabita Ghosh	50	25938
9.	Kamale kamini	8	Bobi Mandal	50	15266
10.	Matara	8	Rubi Mandal	25	14021

Source: Panpur SKUS office

From the five Societies, 30 SHG members were randomly chosen and interviewed through structured questionnaire. Findings of the sample survey are given below:-

Table 7

Sex composition of members

Sex	No. of members	% of members
Female	27	90
Male	3	10
TOTAL	30	100

Table -8

Educational qualification of members

Level of Education	No. of members	% of members
Upto secondary	28	93.33
Above secondary	2	6.67
Graduate	0	0
TOTAL	30	100

Most of the members of SHG's belongs to 30 to 40 years of age. Most of the members are female and married. 53.33% of the members are engaged in agricultural operations and others engaged in shop-keeping, house keeping, weaving, making of jute products etc.

Among the members almost 97% are literate, although most of them have studied upto secondary i.e. 10th standard. In the process of evaluation of their family status it has been observed that 83.33% of the members have drinking water facilities and 67% of the members have sanitation arrangement in their houses.

90% of the members have own residential house. 83% of the members have Cycle's or Television sets or Motorcycles. 57% of the members have informed that they have no savings either personally or jointly in any bank or other financial institutions.

Almost 77% of the members are satisfied with the performance of Co-operative societies. It reveals that 23% of the members are not satisfied with the functioning of the Co-operative societies with which they are attached. They have explained the reasons for their satisfaction or dissatisfaction relating to the functioning of Co-operative Bank and PAC's.

Reasons for satisfaction with the functioning of Co-operative Bank/Societies:-

a) Good co-operation

b) Quick disbursement of loan

c) Proper guidance

d) Proper advice as and when necessary

e) Motivation from senior officials

f) Friendly behavior etc.

Reasons for dissatisfaction with the functioning of Co-operative Bank/Societies:-

a) Insufficient amount of loan

b) Lack of training programme

c) No subsidies

d) Credit trap

e) Short re-payment period etc.

6. CONCLUSION

There are certain misconceptions about the poor people that they need loan at subsidized rates of interest on soft terms, they lack education, skills, capacity to save, credit-worthiness and therefore are not bankable. Nevertheless, the experiences of several SHGs reveal that rural poor are actually efficient managers of credit and finance. Availability of timely and adequate credit is essential for them to undertake any economic activity rather than credit subsidy. For example, percentage of recovery of loan from SHGs by the Nadia DCCB are:

2005-06	:	loan recovery 97.20 %
2006-07	:	loan recovery 98.26 %
2007-08	:	loan recovery 92.36 %

Source: Nadia DCCB

Percentage of loan recovery has fallen in 2007-08 due to 'Bird-flu disease', which affected the villagers of the district to a great extent.

In the budget speech (West Bengal State Finance Budget 2008-09), Finance Minister of West Bengal State Government, Dr. Asim Dasgupta, has said that "in the matter of employment generation in the State, maximum progress has been achieved in the case of Self Help Groups. In the current year (2007-08), the number of Self Help Groups has already reached 7.34 lakh with a total membership of about 70 lakh, 90 per cent of whom are women. These Self Help Groups have mobilised savings from their members and then about 4.36 lakh Self Help Groups have obtained loan from banks on the strength of such savings. In more than 90 per cent of the cases, these loans have also been repaid. According to the assessment of NABARD, about one-third of these groups have qualified, on repayment of earlier loan, for second and third doses of loan. This has resulted in additional employment generation of at least 3 lakh in the current year".

In the words of Prof. Muhummad Yunus, "microcredit programmes work everywhere because everywhere poor people find it difficult to access finance at terms that are reasonable. For microcredit programmes to work effectively, we have to create an enabling environment for microcredit. This refers to an appropriate legal and regulatory framework as well as appropriate funding mechanism for microcredit. Many countries like Bangladesh have put in place this enabling legal framework and the result is that microcredit is flourishing."

To conclude, it can be said that the Co-Operative Banks' in Nadia District of West Bengal have performed an important role in the fulfillment of basic objectives of SHG movement.

REFERENCES

Besley, T., and Coate, S. (1995). Group Lending, Repayment Incentives and Social Collateral, *Journal of Development Economics*, 46(1), 1-18.

Gulati, A, and Bhatia, S. (2000). *Institutional Credit to Indian Agriculture: Defaults and Policy Options*, NABARD Chair Unit, Institute of Economic Growth, Delhi.

Handa, S. and Kirton, C. (1999). The Economics of Rotating Savings And Credit Associations: Evidence from the Jamaican Partner. *Journal of Development Economics*.

Dasgupta, R. (2005). Microfinance in India. *EPW*; March 19.

Zaman (1999). Assessing the impact of Microcredit on Poverty and Vulnerability in Bangladesh in World Development.

Dhirendranath K. (2004): The scenario of population growth in India. Akansha Publishing House, New Delhi.

Fisher, T. and Sriram, M.S. ed. (2002). Beyond Micro-credit: Putting Development Back into Microfinance, New Delhi: Vistaar Publications, Oxford: Oxfam.

Rajivan, A. (2008). Microfinance in India. *Yojana*, January.

Shylendra, H. S. (2008). Role of Self Help Groups. *Yojana*, January.

Seibel, H. D. and Dave, H.R. (2002). Commercial Aspects of SHG Banking in India. *Paper presented at the Seminar on SHG- bank Linkage Programme at New Delhi, November 25-26, 2002.*

Journal of
Business and Economic Issues
Vol. 1 No. 2 July 2009

Profitability Performance of Regional Rural Banks (RRBs) in India: A Region-Wise Comparative Analysis

*Manas Chakrabarti**

ABSTRACT: Since 1975 RRBs are being regarded as one of most important sources of institutional financing of rural credit in India. But at the end of expansion phase financial viability of the RRBs emerged as an important issue to the policy makers. It was pointed out that the RRBs to survive as a credit institution could not remain unviable for long time. In response to the socio economic need, there should be continuous urge to reconcile efficiency and social equity consideration and combine social banking with efficient banking. Generally speaking, physical outreach of RRBs is not an issue in India, however sustainable growth of these institutions is very much in demand as less than half of the credit usage by rural households comes from the formal sources till now. So, there is a need for up-gradation of the rural banking systems (RRBs) in India through performance evaluation in the context of necessity of institutional rural credit. Therefore, an attempt is made through this work to appraise ***region-wise profitability performance of RRBs in India*** in respect to restructuring of rural banking system and also in satisfying the financial needs of the poor rural folk.

Key Words: *profitability performance, regional rural banks, Institutional financing*

1. BACKDROP

Rural banking forms one of the significant parts in Indian banking. Many economists and policy makers opine that the future growth of banking sector in India depends to a large

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extent on the robust performance of the Rural Financial Institutions (RFIs). Among the factors responsible for economic development and poverty alleviation in rural sector, the role of the RFIs is considered very significant as a substantial portion of the institutional rural credit by the RFIs is used for rural development to support formation of rural capital. In India, institutional rural credit is usually arranged by co-operative banks, commercial banks and regional rural banks or RRBs (popularly known as gramin banks) through their various wings. Since 1975 RRBs are being regarded as one of most important sources of institutional financing of rural credit in India. These institutions are established exclusively to meet the excess demand for institutional credit in the un-banked rural areas, particularly among the economically and socially marginalized section. These specialized institutions after much experimentation have ultimately emerged as development inducing institutions with a network of branches spread over the remote villages of the country. The emancipation of rural poor in India is greatly influenced by successful discharge of duties by the RRBs.

Although the performance of RRBs may be gauged from the success of poverty alleviation programmes to which they are dedicated as catalyst, their achievements as commercial banking organization can never be ignored. The objective of social equity can not be accomplished unless the RRBs register a sustainable growth in terms of expansion of credit facilities through earning profit. There is a strong belief that the banks have social responsibility – not only to meet the credit needs of the society but also to extend the facilities at concessional rates of interest. As such, to respond to the socio economic need, there should be continuous urge to reconcile efficiency and social equity consideration and combine social banking with efficient banking.

At the end of expansion phase (the year 1987 marks the end of addition to the number of RRBs) commercial viability of the RRBs emerged as an important issues to the policy makers. It was pointed out that the RRBs to survive as a credit institution could not remain unviable for long time. It was opined that in the absence of viability, rural development could not be possible through social banking (Agriculture Credit Review Committee or Khusro Committee 1989, Velayudham and Sankaranarayanan 1990, Committee on Financial Systems or Narasimham Committee 1991).

In view of the divergent services rendered by the RRBs, an evaluation on the region-wise profitability performance of RRBs in India during post liberalization phase is seriously felt. The present study aspires to make an overall evaluation on region-wise profitability performance of RRBs in India in respect to restructuring of rural banking and also in satisfying the financial needs of the poor rural folk. A period of fifteen years from 1991-92 to 2005-06 is taken for the study. The study period of fifteen years is very much relevant in this context, as these specialized institutions have undergone various reforms and initiated critical measures in spreading diversified activities for the overall development of the rural people. The government has also taken several constructive programme for the up-liftment of the rural people through these institutions.

This paper is basically exploratory in nature and depends exclusively on secondary data. Secondary data are collected from various reports on RRBs published by NABARD and the RBI bulletin. Extensive discussions with the officials and managers of some selected RRBs along with structured interviews have also been conducted. Research methodology tools like line chart, pie chart is considered for some meaningful comparison and analysis to evaluate profitability performance of the RRBs and also to derive some concrete conclusion.

2. PROFITABILITY PERFORMANCE OF RRBs

Profitability should not be regarded as the only criterion for measuring performance of an institution formed in gratifying the social needs. But that does not mean that such institution should totally divorce the principle of economic viability. Again, Non-viability of the RRBs was the most serious concern for the policy makers since its inception. While evaluating the profitability performance of RRBs, it was observed that up to 31st march 1992, almost ninety percent (173 out of 196) of the total number of RRBs experienced continuous losses. As part of the financial sector reforms during 1993-94, GOI along with RBI and NABARD introduced a series of policies for the overall improvement in performance of RRBs. The focus of reform was directed towards - (a) capital restructuring of some selected RRBs, (b) providing operational freedom and, (c) introduction of transparency in financial reports of these entities. The outcome of such reform process was actually felt during 1997-98 and since then (up to 2004-05), there was a remarkable improvement in overall financial performance of the RRBs. During 1997-98, 126 out of 196 RRBs made favorable financial performance. The number further improved to 147 during 1998-99, 162 in 1999-2000 and 167 in 2004-05. In 2005-06 (i.e., post-merger period) 111 out of 133 RRBs (89 RRBs were merged to form 26 RRBs) in India have shown a positive working result. The overall profitability performance of RRBs improved from Rs. (-) 203.60 crore to Rs.617.13 crore during the period 1991-2006 (Table 1). However, aggregate profit of the RRBs has declined profoundly in 2005-06 due to increase in accumulated losses of some of the amalgamated RRBs in eastern region during post merger period (merger process, as a part of repositioning of RRBs, begins on and from 12th September 2005) e.g., Bihar Kshetriya Gramin Bank (merged entity of three banks namely Monghyr KGB, Bhagalpur-Banka KGB and Monghyr KGB) in Monghyr district of Bihar and Kalinga Gramya Bank (merged entity of two banks namely, Cuttack Gramya Bank and Balasore Gramya bank) in Cuttack district of Orissa. In case of Bihar Kshetriya Gramin Bank losses jumped from Rs.6.27 crore to Rs.26.04 crore and in case of Kalinga Gramya Bank, from Rs.10.17 crore to Rs.25.53 crore.

A region wise analysis of performance of RRBs in the country revealed that during the fifteen years period from 1991-2006, profitability performance had improved in every region (Table 2 and Figure 1). The performance of RRBs working in southern, central and northern parts was much better than the rest. A few of them are – Rayalseema gramin bank (Andhra Pradesh) and Malaprabha gramin bank (Karnataka) in southern region, Prathama bank (Uttar Pradesh) in central region and Gurgaon gramin bank (Haryana) in

northern region. However, only the RRBs operating in southern have shown a continuous improvement in their profitability performance during the study period. Lower level of NPAs, continuous credit expansion with the help of good recovery performance, targeted lending assist RRBs in this region to boost their individual profitability performance.

While examining the profitability performance, most serious concern in respect of the workings of RRBs during 1991-2006 was an ever increasing accumulated loss, which stood at Rs.2636.85 crore as on 31st march, 2006. During the study period, accumulated losses jumped from Rs.759.43 crore to Rs.2636.85 crore and losses in every region was augmented with the exception of southern region (Table – 3 and Figure - 2). It is significant that the contribution of the RRBs working in eastern region was maximum i.e., 60.73 percent in 2006 particularly those operated in Bihar and Orissa district namely, Vaishali Kshetriya gramin bank, Champaran Kshetriya gramin bank, Bhagalpur-Banka KGB, Monghyr KGB (Bihar), Bolangir gramin bank, Balasore gramin bank (Orissa). The accumulated losses in these two states were Rs.1,123.98 crore as on 31st March, 2006 (almost 43 percent of the total accumulated losses). Again, accumulated losses of RRBs in this region increased to Rs. 1601.25 crore from Rs. 291.73 crore (from 39 to 61 per cent of the total) during 1991-2006. In this regard, it is remarkable that RRBs working in Haryana, Himachal Pradesh and Punjab in northern region, Meghalaya in north-eastern region, Gujrat in western region and every state in southern region (i.e., Andhra Pradesh, Karnataka, Kerala and Tamilnadu) have completely wiped off their individual accumulated losses as on 31st march, 2006.

Performance of the RRBs and their branches in eastern region revealed that most of the rural branches are working only on walk in business and are not making the requisite efforts to develop business through customer contact and customer need analysis. Further, it is also observed that the customer coverage is centered around two to three villages for deposits and another two villages for their advances. Even in the villages, a part of the households (around 40 percent) may be reached. A study of their average transaction per day shows that most of the loss making branches of RRBs in this region has on an average 30-40 cash transaction per day as against 75-100 per day in profit making branches. Again, most of the loss making branches of the banks in this region is reluctant in providing working capital and term loans for agriculture. Instead they are satisfied with the easy to process loans for retail trade, small business, housing repairs, salary earners etc. Another phenomenon is under reporting of NPAs in the branches income of the banks, which in turn inflates the non-existing profitability of the banks. One more dimension to the problems of loss making branches is the lack of basic banking discipline in adherence to the timings and procedures in customer service. The delay in provision of services and credit facilities together with the indifferent attitude of the staff is topping the list of problems to the customers. On account of operational as also attitudinal limitations in coverage and outreach, the customers are forced to approach the rural shylocks. Again, high operating costs in handling small loans result in erosion of RRBs margin. They also do not have much scope of cross subsidization in the absence of loans that may yield high returns. Moreover, willful defaults, misuse of loans, lack of follow up, wrong identification of borrowers, extension of *benami* loans, staff agitations etc., have aggravated the problems

further. Skills up-gradation of the employees is also an area of concern. Lack of broad based banking services, lack of adequate support from the sponsor banks and the state governments, stiff competition among the rural banks etc., also have weakened the RRB culture in eastern region (Sinha et al. 2003).

The various committees and research studies, to probe the poor profitability performance of gramin banks in India (Particularly those operated in north-eastern and eastern region) concluded that, weak viability was inbuilt into most of these institutions. Restrictions on the types of their lending, low capital base, high intermediation cost, poor recovery of advances, thin 'spread' (interest earned *less* interest paid), limited potential for business growth offered by their operation, multiple functional controls and limited opportunities for profitable investment of surplus funds were identified to be the major factors inhibiting their growth and profitability performance (Bhattacharya 1994, Mahajan et al 1996, Das 2001, Hosamani 2002, Shekhar 2006, Misra 2006). Giving pay parity to RRBs staff with their sponsor banks, loan waiver schemes and low employee motivation caused by their uncertain career path further eroded profitability and viability of the RRBs (Hadi et al. 2006).

3. CONCLUSION

The subject of improving the viability and profitability position of RRBs has recurred several times from the time when they are established, specifically since the beginning of the reform process but without any policy outcome. Various working group and committees have prescribed different measures as also models for restructuring the RRBs since their inception viz., functioning of RRBs as a rural wing of the Public Sector Banks so that losses incurred by them can be absorbed by sponsor banks through higher rate of interest on their lending activities in other areas (Sivaraman Committee 1981), absorption of losses of RRBs by the shareholders in the same proportion of their shareholdings' (CRAFICARD 1983), merger of small and uneconomic RRBs in the interest of economic viability (Kelkar Committee 1984, Khusro Committee 1989), comprehensive restructuring of RRBs through recapitalization (Bhandari Committee 1994), liquidation of very week RRBs (Basu Committee 1996; Thingalaya Committee 1997), necessary autonomy for RRBs in their credit and other portfolio management system (Vyas Committee I 2001), consolidation of the entire system of RRBs while retaining the advantages of regional character of these institutions (Chalapathy Rao Committee 2003), amalgamation of RRBs according to sponsored bank wise and on regional basis (Vyas Committee II 2004, Purwar Committee 2004).

The notion of viability for the RRBs was much more nuanced than what is denoted under the neo-liberal reform era. It is true that the commercial principles of banking were put under stress, especially in the later part of 1980s, which needed corrective steps, and indeed many of the policy recommendations of that time were geared to improve recovery and reduce losses incurred by the RRBs. However, it was conceived that these improvements should be carried out within the parameter set for the RRBs, which in turn were determined by the overall vision of commercial banking. The reform phase supplanted this understanding

with a singular focus on commercial viability of the RRBs. In particular, the restructuring of the RRBs were no different from reforms of the commercial banks. Some of the remarkable steps taken by GOI towards restructuring of RRBs were – relocation of the branches to more promising areas, closure of sustained loss making branches, fall in credit-deposit ratio, enhancement of investments in government securities, PSU bonds and debentures by neglecting a further improvement in loan portfolio, increase in NPS advances without diluting the priority sector definition, deregulation in interest rates on lending and most importantly sponsored bank wise amalgamation of the RRBs, which was started on and from 12th September 2005 for improving the commercial viability of the RRBs. Thus, there were some considerable initiatives towards a sensible blend of the central and the progressive elements of the 'RRB innovation' while pursuing a 'nuanced' criterion of practicability of RRB culture in India.

Table 3

Region wise Position of Accumulated Losses of RRBs in India during 1991-2006

(Rs. in crore)

Region	1991-92	1996-97	2001-02	2005-06
North	101.73	381.89	326.48	276.14
North-East	61.04	232.78	274.99	252.23
East	291.73	1031.25	1272.89	1601.25
Central	208.45	783.74	608.81	373.59
Western	51.39	193.67	143.77	133.65
Southern	45.09	228.16	67.79	00
All India	**759.43**	**2851.49**	**2694.73**	**2636.85**

Source: NABARD, Statistical Reports, Institutional Development Department, (RRBs Division), various issues from 1991-92 to 2005-06.

Figure 1

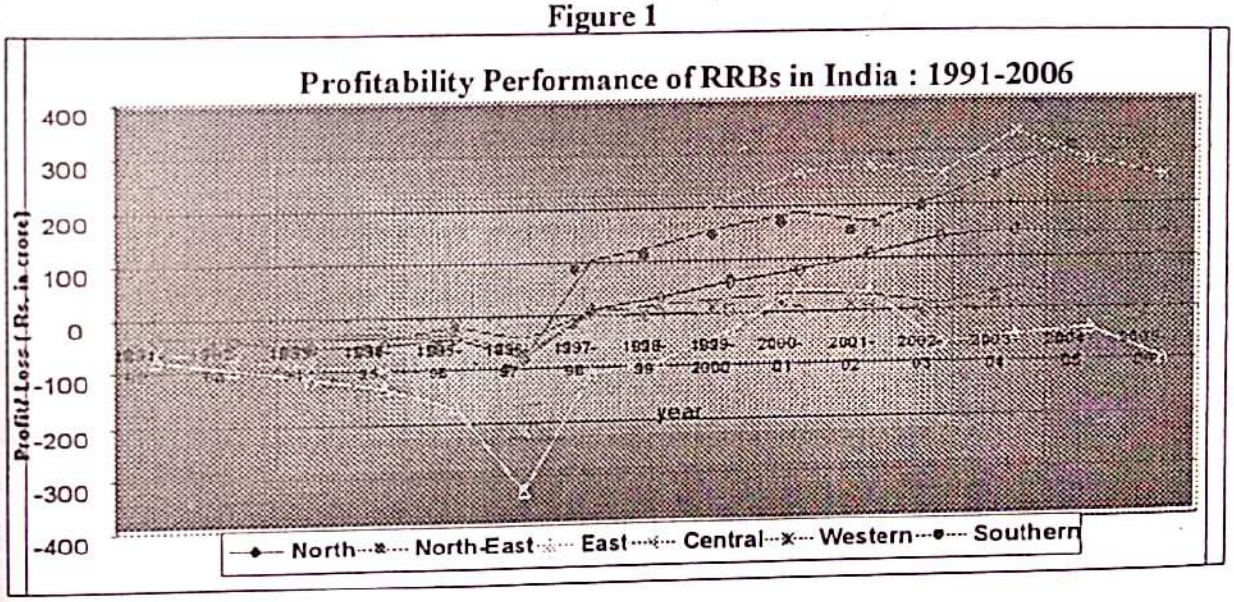

Figure 2

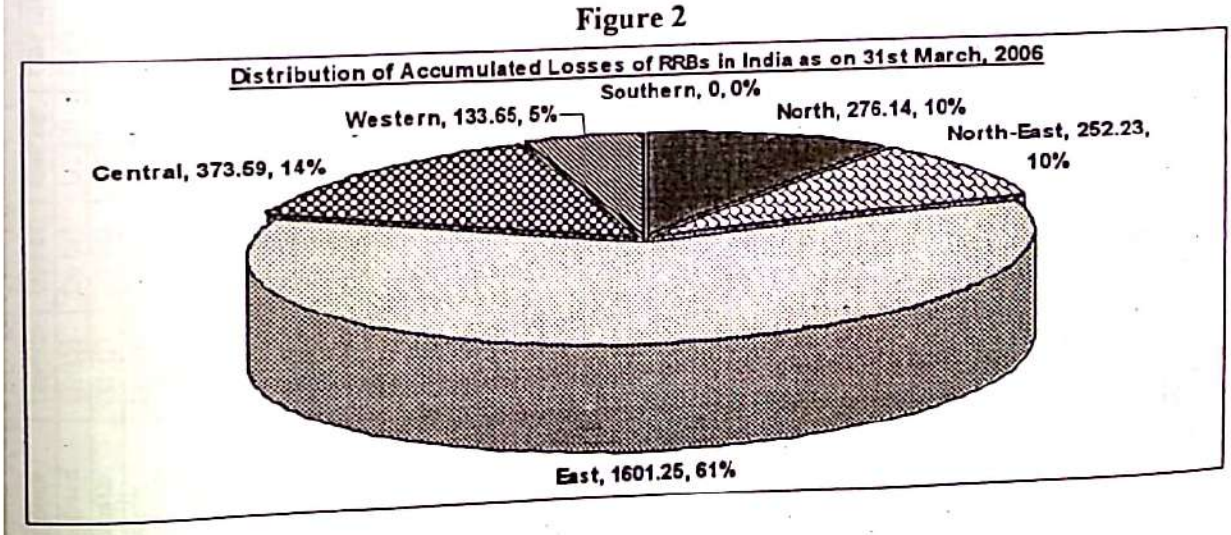

Table 1

Profitability performance of RRBs in India during 1991-2006 (Rs. in crore)

Year	No. of RRBs	Profit making RRBs		Loss suffering RRBs		Total profit / Losses (Rs.)	Accumulated losses (Rs.)
		Nos.	Amount of Profits (Rs.)	Nos.	Amount of losses (Rs.)		
1991-92	196	23	12.95	173	(259.37)	(246.42)	(759.43)
1992-93	196	24	13.74	172	(327.76)	(314.02)	(1073.45)
1993-94	196	23	21.91	173	(388.86)	(366.25)	(1318.17)
1994-95	196	32	28.96	164	(423.21)	(394.95)	(1834.75)
1995-96	196	44	42.38	152	(467.97)	(425.59)	(2043.95)
1996-97	196	44	59.68	152	(879.36)	(819.68)	(2851.49)
1997-98	196	126	304.22	70	(230.57)	73.65	(3116.20)
1998-99	196	147	419.70	49	(178.10)	241.6	(3100.83)
1999-2000	196	162	543.52	34	(113.55)	429.97	(2978.90)
2000-01	196	170	676.48	26	(75.86)	600.62	(2792.59)
2001-02	196	167	699.92	29	(92.05)	607.87	(2694.73)
2002-03	196	156	733.96	40	(214.67)	519.29	(2752.25)
2003-04	196	163	952.33	33	(183.65)	768.68	(2725.35)
2004-05	196	167	904.43	29	(153.96)	750.47	(2715.01)
2005-06	133 *	111	807.80	22	(190.67)	617.13	(2636.85)

Source: NABARD, Statistical Reports, Institutional Development Department, (RRBs Division), various issues from 1991-92 to 2005-06.

**Figures in bracket indicate losses*

** Merger process of RRBs was started on and from 12th September 2005 and there are altogether 133 amalgamated RRBs at the end of 31st March, 2006*

Table 2

Region wise Progress of Profit and Losses of RRBs in India during 1990-2005 (Rs. in crore)

Region	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
[illegible]			(56.16)	(52.19)	(43.15)	(81.16)	9.21	31.37	56	77.89	105.2	135.36	147.32	142.16	141.31
			(27.88)	(31.23)	(35.99)	(68.67)	(1.16)	(3.66)	1.61	(2.38)	(2.07)	(6.57)	19.74	17.65	6.90
			(115.65)	(134.76)	(170.51)	(330.08)	(110.87)	(92.89)	(32.65)	42.49	34.64	(63.02)	(47.65)	(39.41)	(97.36)
			(86.89)	(98.45)	(114.99)	(218.63)	68.94	162.83	212.45	261.45	273.15	254.46	335.63	280.93	251.19
			(42.62)	(39.29)	(20.49)	(42.88)	4.77	13.6	28.28	33.80	30.06	9.66	43.03	19.67	8.94
			(37.76)	(38.33)	(40.44)	(78.26)	102.76	130.34	164.00	187.37	166.89	213.5	270.62	329.47	306.15
			(366.95)	(394.25)	(425.59)	(819.68)	73.65	241.6	429.97	600.61	607.87	519.29	768.68	750.47	617.13

REFERENCES

Bhattacharya, P. (1994). *Problems and Prospects of Regional Rural Banks – A Case Study of Mayrakshi Grameena Bank, West Bengal,* Agricultural Banker, 28-34.

Das, R. K. (2001) *Financial Viability and Profitability Problems of RRBs – with Particular Reference to UBKGB,* Finance India, February, 9-11.

Hadi, A. and Bagchi, K. K. (2006). *Performance of Regional Rural Banks in West Bengal: an Evaluation,* Vedam eBooks (P) Ltd., New Delhi, 184-188.

Hosamani, S. B. (2002). *Performance of Regional Rural Bank: A Study,* Anmol Publication, 157-159

Mahajan, V. and Ramola, B. G. (1996). *Financial Services for the Rural Poor and Women in India,* Journal of International Development 8(2), 211-214.

Misra, B. S. (2006). *The Performance of Regional Rural Banks (RRBs) in India: Has past anything to suggest for the future,* Occasional Paper, 27(1, 2), Reserve Bank of India, 22-27 .

Shekhar, H. (2006) *Regional Rural Bank in India,* Vedam eBooks (P) Ltd., New Delhi, 192-193.

Sinha, S., Chetan, T., Ruthven, O., and Pathak, N. (2003). *The Outreach/Viability Conundrum: Can India's Regional Rural Banks really serve low Income Clients?,* Overseas Development Institute, London (U.K.) 45-47.

Statistics on RRB: (1991-92 to 2005-06). Institutional Development Department, NABARD (Mumbai).

Velayudham, T. K. and Sankaranarayanan, V. (1990). *Regional Rural Banks and Rural Credit: Some Issues,* Economic and Political Weekly, September 22, 113-115.

Journal of
Business and Economic Issues
Vol. 1 No. 2 July 2009

Performance of Bally Co-operative Bank Ltd., West Bengal during 1997-98 to 2006-07: A Study

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ABSTRACT: Urban co-operative banks are one of the vital segments of the banking industry of the country. They essentially cater to the credit needs of persons of small means. There were 1813 urban co-operative banks in the country at the end of March 31, 2007 with a total deposits and advances of Rs.120983 crore and Rs.78660 crore respectively. On the other hand, 51 UCBs were found functioning in West Bengal at the end of March, 2007 with a deposit of Rs.1861 crore and loans and advances of Rs.1211 crore.

Though some UCBs have shown credible performance in the recent years, a large number of banks have shown discernible signs of weakness. The operational efficiency is unsatisfactory and characterized by low profitability, ever growing non-performing assets (NPA) and relatively low capital base. Probably the biggest challenge facing the banking sector, especially the UCBs, is the non-availability of good quality assets. The large-scale sickness in the UCBs has shaken the public confidence in co-operative banks. In this context, the paper makes an attempt to examine the working and financial performance of the urban co-operative banks. To make our analysis simpler and presentable we have taken up the working of Bally Co-operative Bank Ltd. of West Bengal as a case study. The objective of the study is to identify and analyze the trend, progress and problems of this bank and to throw light on the problems of swelling NPAs and to offer some meaningful suggestions for improving the efficiency and effectiveness in the operation of this bank.

1. INTRODUCTION

Urban co-operative banks (UCBs) are one of the vital segments of the banking industry of the country. These banks are the best vehicles for taking banking to the doorsteps of common men, unbanked people in urban and semi- urban areas in particular. The co-operative movement in India gained momentum with the establishment of the Co-operative Credit Societies Act, 1904. After the enactment of the Act, primary co-operative credit

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societies were set up in the urban areas, called the urban co-operative banks, with the objective of promoting sustainable banking practices among the lower and middle income strata of the urban population. These societies are mostly located in towns and cities and cater to the credit requirements of the urban clientele. These banks organised on a limited liability basis, generally extend their area of operation over a town. The main functions of these banks are to promote thrift by attracting deposits from members and non-members and to advance loans to the members. The urban co-operative banks are organised under dual control of Reserve Bank of India and the respective State Governments.

The spatial distribution of UCBs across the country is skewed, with significant concentration in 5 states, viz. Maharashtra, Gujarat, Karnataka, Tamil Nadu and Andhra Pradesh. Operations of urban co-operative banks have expanded rapidly since 1966, when they were brought under the purview of the Banking Regulation Act, 1949.In 1966, there were about 1100 UCBs with deposits and advances of Rs 167 crore and Rs 153 crore respectively. The UCBs continued to grow at a faster pace till 2003, when their number increased to 1941 and their deposits and advances to Rs 101546 crore and Rs 64880 crore respectively. Subsequently, the number of UCBs declined in 2007 to 1813 with total deposits of Rs 120983 crore and advances of Rs 78660 crore. On the other hand, at the end of March 2007, 51 urban co-operative banks were found functioning in West Bengal with deposits of Rs.1861 crore and loans and advances of Rs.1211 crore.

Though some UCBs have shown credible performance in the recent years, a large number of banks have shown discernible signs of weakness. The operational efficiency is unsatisfactory and characterized by low profitability, ever growing non-performing assets (NPA) and relatively low capital base. Over a long period of time, the performances of UCBs have been deteriorating due to non-recovery of interest and installment of loan portfolio. Probably the crucial challenge the banking sector encountered, especially the UCBs, is the non-availability of good quality assets. In case banks are unable to generate income due to NPAs, it will put the banks into liquidity crunch. In this context, the paper makes an attempt to examine the working and financial performance of the urban cooperative banks. To make our analysis simpler and presentable we have taken up the working of Bally Co-operative Bank Ltd. of West Bengal as a case study.

The paper is divided into six sections. In section I and II Introduction and objectives of the study have been serialized. Section III contains the data and methodology, section IV deals with the profile of the bank. The analysis and interpretation of data are presented in section V and section VI is a concluding part wherein some remedial measures have been suggested.

2. OBJECTIVE OF THE STUDY

The study has the following objectives:

- To analyze the performance of the bank in mobilizing deposits.

- To identify the trends in the volume and direction of credit advanced by the bank.
- To identify the problem of swelling NPAs and to examine whether the bank has taken the initiative for keeping NPAs under control and reduce NPAs to the expected level so that the bank does not fall into lower category.
- To evaluate the performance of the bank in terms of profit earned.
- To find out ways and means for improving the efficiency and effectiveness in the operation of the bank.

3. RESEARCH METHODOLOGY

The present study is based on secondary data and other information provided by the Bank in its published annual reports for the period from 1997-98 to 2006-07. The data collected are analyzed with the help of the statistical tools like ratios, percentages, averages, trend analysis and chi-square (χ^2) test, etc. The formula which is used for computing χ^2 is $\Sigma\{(O-E)^2/E\}$; where, O= Observed value and E= Expected value.

4. BALLY CO-OPERATIVE BANK LTD. (BCB) – A PROFILE

The urban co-operative movement in the district of Howrah started its journey with the establishment of Bally Co-operative Credit Society. It was registered on 3rd October 1925. The first board of the society was constituted by eighteen promoter members. This bank had come under the purview of the Banking Regulation Act, 1949 on 22.03.1990, as it obtained license for carrying on banking business from RBI with effect from that date. The Bank has no branch. The area of operation of the Bank is restricted to Bally, Belur, Bhattanagar and Liluah. The number of members of the Bank stood at nearly 24300 at the end of March, 2007.

5. ANALYSIS AND INTERPRETATION

- Deposit Mobilization: In the area of deposit mobilization the performance of the bank was not satisfactory, particularly during the last two years. Total deposits of the bank increased from Rs 1002.15 lakh in 1997-98 to Rs 2479.75 lakh in 2004-05 and thereafter declined to2188.44 lakh in 2005-06, and again reduced to Rs 1669.76 lakh in 2006-07 .It attained negative growths during the last two years amounting to11.74% and 23.70% respectively.

- Loans and Advances: The amount of loans and advances standing at Rs 985.35 lakh in 2006-07 was found to grow near about 2 times over the period, as the same stood at Rs 334.67 lakh in 1997-98. It declined significantly from Rs 1373.98 lakh in 2004-05 to Rs 985.35 lakh in 2006-07, and therefore registering negative growth of 24.51%. The credit deposit ratio stood at 44.86% on an average.

- **Working Capital:** The working fund was Rs 1080.83 lakh at the close of the year 1997-98, which increased to Rs 2687.07 lakh in 2004-05, and thereafter reduced from Rs 2330.47 lakh in 2005-06 to Rs 1814.07 lakh in 2006-07. The share of deposits to working fund remained above 88% on an average and percentage of share capital ranged between 1.78% and 2.67% over the period.

- **NPA Management- Recovery of loans and Advances:** Having a closer look at the NPA position of the bank it emerges that the amount of gross NPAs kept on mounting during last few couple of years from 2001-02 to 2006-07 in the way of Rs.149.62 lakh, Rs.237.04 lakh, Rs.559.83 lakh, Rs.689.82 lakh, Rs 713.77 lakh and Rs 740.09 lakh respectively. The percentage of gross NPAs to gross advances had also jumped up in the same way like 14.12%, 18.17%, 41.12%, 50.21%, 54.69% and 75.11% respectively. The relative share of gross NPA was 31.42% on an average, which is much higher than the stipulated level of 15%. The percentage of net NPA to net advances during the same years were 8.46%, 13.69%, 33.83%, 35.42%, 32.52%and 48.88%, respectively all of which are too above the tolerance limit of 10%.

- Profitability: In the area of earning appraisal the picture was quite dismal. The bank had suffered a huge loss amounting to Rs.166.26 lakh, Rs 351.49 lakh and Rs 78.17 lakh respectively during last three years, whereas in earlier years it made a net profit of very small amounts. Due to the huge accumulated losses the net worth of the bank remained negative and the estimated erosion in value of the assets had wiped out its entire owned funds and also affected a part of its deposits. The CRAR had been negative for the preceding three years, which was amounted to –22.94%, -37.67% and –90.17% respectively.

Table I
Financial Position of Bally Co-operative Bank Ltd.

(Rs. In Lakh)

Year	Share capital	Reserve '& other Fund	Working capital	Deposits	Loan & advances	Net profit	CD Ratio (%)	Diversification Ratio (%)	CRAR (%)	Gross NPAs *(%)	Net NPAs #(%)
1997-98	26.52	52.16	1080.83	1002.15	334.67	28.08	33.39%	12.34%	NA	48.06	10.84
1998-99	26.97 (1.70)	59.37	1299.52 (20.23)	1213.18 (21.06)	349.23 (4.35)	8.70	28.79%	3.42%	NA	(14.36) 56.05 (16.05)	(3.64) 14.85 (4.82)
1999-00	27.53 (2.08)	67.14	1582.23 (21.75)	1487.56 (22.62)	400.95 (14.81)	12.68	26.95%	4.20%	NA	65.03 (16.22)	15.18 (4.32)
2000-01	28.17 (2.33)	82.81	1854.79 (17.23)	1743.81 (17.23)	563.79 (40.61)	30.30	32.33%	6.51%	NA	79.66 (14.13)	24.82 (4.88)
2001-02	29.58 (5.00)	90.45	2340.75 (26.20)	2220.72 (27.35)	1059.17 (87.86)	46.76	49.82%	14.45%	NA	149.62 (14.12)	84.05 (8.46)
2002-03	32.17 (8.75)	107.01	2572.00 (9.88)	2432.82 (9.55)	1304.37 (23.15)	11.10	48.36%	3.58%	6.26%	237.04 (18.17)	169.53 (13.69)
2003-04	39.76 (23.59)	141.39	2645.68 (2.86)	2464.52 (1.30)	1361.51 (4.38)	-18.69	54.95%	18.22%	4.00%	559.83 (41.12)	409.94 (33.83)
2004-05	47.92 (20.52)	159.40	2687.07 (1.56)	2479.75 (0.62)	1373.98 (0.89)	-166.26	55.40%	4.62%	- 22.94%	689.82 (50.21)	375.19 (35.42)
2005-06	47.63 (-0.01)	94.40	2330.47 (-13.27)	2188.44 (-11.74)	1305.19 (-5.01)	-351.49	59.64%	3.05%	- 37.67%	713.77 (54.69)	284.97 (32.52)
2006-07	45.24 (-0.05)	99.07	1814.07 (-22.16)	1669.76 (-23.70)	985.35 (-24.51)	-78.17	59.01%	3.18%	- 90.17%	740.09 (75.11)	234.47 (48.88)

Source: Annual Reports of the Bally Co-operative Bank Ltd.
Note: Figures in the bracket denote 'percentage change over the previous year'.

Table II
Trend Values of selected financial parameters

Year	Deposits			Loans& Advances			Working Fund		
	Actual Value	Trend Value (Y_D)	Deviation	Actual Value	Trend Value (Y_L)	Deviation	Actual Value	Trend Value (Y_W)	Deviation
1997-.98	1002.15	1340.17	-338.02	334.67	356.96	-22.29	1080.83	1294.99	-214.16
1998-99	1213.18	1462.42	-249.24	349.23	478.48	-129.25	1299.52	1434.04	-134.52
1999-00	1487.56	1584.67	-97.11	400.95	600	-199.05	1582.23	1573.09	9.14
2000-01	1743.81	1706.92	36.89	563.79	721.52	-157.73	1854.79	1712.14	142.65
2001-02	2220.72	1829.17	391.55	1059.17	843.04	216.13	1340.75	1851.19	-510.44
2002-03	2432.82	1951.42	481.4	1304.37	964.56	339.81	2572	1990.24	581.76
2003-04	2464.52	2073.67	390.85	1361.51	1086.08	275.43	2645.68	2129.29	516.39
2004-05	2479.75	2195.92	283.83	1373.98	1207.6	166.38	2687.07	2268.34	418.73
2005-06	2188.44	2318.17	-129.73	1305.19	1329.12	-23.93	2330.47	2407.39	-76.92
2006-07	1669.76	2440.42	-770.66	985.35	1450.64	-465.29	1814.07	2546.44	732.37

Trend Analysis of selected financial parameters:

□ **Trend of Deposits:** The trend of deposit is being shown in Table II. Here, Y_D stands for computed values of deposits based on the least squares equation in the form of $Y_D=a+bX$, where the equation comes to $Y_D = 1217.92+122.25X$; with origin at the year 1997-98 and X unit= 1 year and Y unit = rupees in lakh. The yearly increase in trend deposit stood at Rs 122.25 lakh. The trend values of deposits were showing increasing trend throughout the period. Table II depicts that during the years 2000-01 to 2004-05 the actual deposits were in excess of the trend values, whereas in all the other years actual deposits were lower than trend values. The significance of the difference between the original and trend values of deposits has also been examined by applying the statistical Chi-square test (χ^2). The calculated value of χ^2 (698.0354) is greater than the tabulated value of χ^2 (16.919) at 5 % level of significance with (10-1) i.e. 9 degree of freedom, and hence the null hypothesis (H_o) is rejected. It implies that the differences between the actual values and the trend values of deposits are significant.

□ **Trend of Loans and Advances:** Table II exhibits that the trend values of loans and advances were increasing continuously throughout the period. Here the least square linear trend equation of loans and advances has been obtained as $Y_L = 235.44+121.52X$. The yearly increase in the trend value of loans and advances stood at Rs 121.52 lakh. The deviations between the actual values and the trend values of loans and advances were negative during 1997-98,1998-99,1999-00,2000-01, 2005-06 and 2006-07, while these were positive during the remaining years. Now, the calculated value of χ^2 comes to (554.3884), while the tabulated value of χ^2 is 16.919 at 5% level of significance with 9 degree of freedom. As the calculated value of Chi-square exceeds the critical value, it indicates that the differences between the actual values and the trend values of loans and advances are significant.

➢ **Trend of Working Fund:** Yw stands for computed values of working fund based on the linear least square equation in the form of $Yw = a+bX$, where the equation comes to $Yw = 1155.94+139.05X$. The yearly increase in trend value of working fund has been found as Rs 139.05 lakh. The trend values of working fund were showing upward movement over the period. The deviations between actual and trend values were negative during 1997-98,1998-99,2001-02,2005-06 and 2006-07, while these were positive in rest of the years. The calculated value of $\chi 2$ (786.3942) is greater than the tabulated value of $\chi 2$ (16.919) at 5 % level of significance, and hence the null hypothesis (Ho) is rejected. It implies that the differences between the actual values and the trend values of working fund are significant.

6. SUMMARY OF FINDINGS AND CONCLUSIONS

- It is observed that the percentage of gross NPA and net NPA for the last five years stood at 18.17%, 41.12%, 50.21%, 54.69%, 75.11% and 13.69%, 33.83%, 35.42%, 32.52%and 48.88%respectively. On an average, these percentages were 31.42% and 19.04% respectively, which were much above the tolerance limit of 15% and 10% respectively.

- The CRAR had been negative for the preceding three years, which amounted to –22.94%, -37.67% and –90.17% respectively.

- The bank had suffered huge losses amounting to Rs.166.26 lakh, Rs 351.49 lakh and Rs 78.17 lakh respectively during last three years.

- The percentage of deposits to working capital remained above 88 % throughout the period. On the other hand, the relative share of share capital in working capital ranged between 1.78% to 2.67% only. This poor resource base is one of the vital constraints of this bank.

- The credit deposit ratio has been found at 44.86% on an average, which is much lower than desired ratio of 60%.

- The diversification ratio stood at 7.36% on an average. It implies that the income from sources other than banking activities is negligible and insignificant.

- It is found that the trend values of deposits were showing increasing trend throughout the period under study. As the calculated value of Chi- square exceeds the tabulated value, it indicates that the difference between the actual values and the trend values of deposits are significant.

- The relationship between the time factor and working fund of the bank did not hold good as is pronounced from the result of chi-square test of goodness of fit at 5% level of significance.

- The differences between the actual and trend values of loans and advances are significant and they have not arisen due to sampling fluctuations. It is thus, concluded that this parameter is not influenced by the time factor.

On the basis of above discussions, we now offer the following suggestions for improving the efficiency and effectiveness in the operation of the bank:

- It is apparent that the mounting overdue has become a major problem of this bank and it performance in managing NPAs is not satisfactory. Firm measures should be taken to make credit appraisal, documentation, disbursement, monitoring etc. Drastic action should be adopted for recovery of sticky advances and reduction of NPAs.

- The bank needs to prepare a comprehensive perspective plan for product diversification to increase its fee-based income.
- The bank can also go for such schemes for opening of saving bank and other accounts treated as low cost deposit so that deposit base of the banks will take a remarkable shape.
- This bank needs a high degree of professionalism in management.
- It should consider technology upgradation to cope up with the changing banking scenario.
- It would be prudent to adopt corporate governance in the field of this urban co-operative bank.
- The management of the bank should be very much cautious against weakness, which generally creeps in through the political interference in the operations of the bank.

It emerges that the financial position of the bank is riddled by alarming NPA. The mounting overdue hampers the smooth flow of credit adversely affecting the profitability and viability of the bank. This swelling overdue has become a panic in the minds of the customers of the bank which is reflected in both deposit and credit portfolio of the bank and as a consequence deposits have been withdrawn and loans have not been furnished. The trend of major financial indicators exhibits that the bank has not taken adequate steps to improve the level of CRAR, step up recovery efforts to bring down its gross and net NPA below the tolerance limits, improve its profitability etc and as a result this bank has been classified as "Weak"(Grade IV) with reference to its financial position and put under a programme of rehabilitation .The bank is now working as per the direction of RBI.

REFERENCES

Bedi, R. D. (1969). *Theory, History and Practice of Co-operation.* Loyal Book Depot, Meerut.

Cole, G.D.H. (1944). *A Century of Co-operation.* George Allen and Unwin Ltd., London.

Dhingra, I. C. (1993). *Theory and Practice of Rural Banking in India.* Sultan Chand and Sons, New Delhi.

Dubhashi, P. R. (1988). *Principles and Philosophy of Co-operation.* Vaikunth Mehata National Institute of Co-operative Management, Puna.

Dutta, S. K. (1991). *Co-operative Societies and Rural Development.* Mittal Publications, New Delhi.

Dutta, U., and Basak, A. (2008). Appraisal of Financial Performance of Urban Co-operative Banks- A Case Study. *The Management Accountant,* ICWAI, 43(3), March.

Hough, E. M. (1966). *Co-operative Movement in India.* Oxford University Press, New Delhi.

Iyengar, A. S. K. (1961). *A study in the Co-operative Movement in India.* Current Book House, Bombay.

Joshi,V. C., and Joshi, V.V. (2005). *Managing Indian banks- The Challenges Ahead.* 2nd ed. Response Books Sage Publications India Pvt. Ltd, New Delhi.

Krishna, D. (2002). Future Strategies to Strengthen the Urban Co-operative Banks, *The Cooperator,* 40(5), NCUI, New Delhi.

Kulkarni, K.R. (1955). *Theory and Practice of Co-operation in India and Abroad.* The Co-operator's Book Depot, Bombay.

Laud, G. M. (1980). *Co-operative Banking in India.* Sage Publications, New Delhi.

Mathur, B. S. (1973). *Co-operation in India.* Sahitya Bhawan, Agra.

Nayak, U. C., and Roy, A. K. (1988). *Co-operation and Co-operative Management.* Kalyani Publishers, New Delhi.

Roy, D. (1982). *Reorganition of Rural Credit in West Bengal Through the Co-operative Institutions During the Plan Period.* West Bengal State Co-operative Union, Calcutta.

Sarangi, M., and Selvaraju, R. (2005). *Structure, Management and Non-Agricultural Credit Co-operatives in Tamil Nadu - A Socio-Economic Perspective.* New Central Book House (P) Ltd.

Journal of
Business and Economic Issues
Vol. 1 No. 2 July 2009

Reinsurance Business in India and Performance Analysis of the National Reinsurer

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ABSTRACT: Reinsurance is the diversification of insurance risks by the insurance companies. It is generally done when the risk involved is huge and the claim of which may prove disastrous for functioning of the company. Prior to nationalization of insurance sector in 1973, the reinsurance market in India had a much diluted presence in the industry. In the initial stage of the development of insurance business in India very high risk based projects were not the cases. The entire general insurance business in India was nationalised in the year 1972 and simultaneously General Insurance Company (GIC) was formed with four fully owned subsidiary companies having sole power to operate general insurance business. These companies functioned under government control for almost three decades. Indian insurance sector was again open to private players both domestic and foreign. IRDA was constituted as an autonomous body to regulate and develop the insurance industry. Then in November 2000 GIC was notified as the Indian Reinsurer and thereafter from 21st March 2003, GIC ceased to be a holding company of its four subsidiaries. Since then its working and functions, are regulated by IRDA. In this paper we have tried to trace the developments of reinsurance business in India and have analysed the performance of GIC, being the flagship company for reinsurance.

Key Words: *Reinsurance, General Insurance, Cession, Risk, Claim*

1. INTRODUCTION

Insurance is a contract under which one party (the insurer) accepts significant insurance risks from another party (the policyholder) by agreeing to compensate the policy holder if

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specified future event (the insured event) adversely affects the policyholder, against a payment of premium as a consideration.

On the other hand 'reinsurance' is a transaction where a company in return of a premium paid to it, indemnifies another person/company for a portion or all of the liability taken up by the latter due to a policy of insurance that it has issued. The company purchasing reinsurance policy is known as the ceding insurer or reinsured, and the company selling the policy is known as the re-insurer. Therefore, re-insurance is defined as an agreement between two insurance companies under which an insurance company can protect itself with other insurance companies against the risk of losses.

An insurer enters into a reinsurance agreement either due to the nature of risk insured or as a part of business strategies of the insurer. It is an independent contract between the re-insurer and the insurer and the original policyholder is not a part of the contract. If the claimant is an individual or even a group of individuals, an insurance company will find it, relatively easy to cover the claims. But if there are large numbers of claims at a time and the loss is massive and widespread, a single insurer will not be able to bear such losses. Therefore, an unbearable loss is broken down into bearable units by risk transfers. In this context reinsurance plays an important part in determining the success of the insurance business. Reinsurance primarily deals with catastrophe risks (like, hurricanes, earthquakes, lawsuits, collisions, sickness and death, etc.) that are not predictable and cause greatest exposure of risks to the insurance company. *(Motihar 2007, Mishra 2004, Swain 2009).*

This paper tries to trace the developments of reinsurance business in India and also assess the performance of GIC, the background player for successful performance of insurance industry. The paper is divided into 5 sections. After 'Introduction' the second section deals with 'History of Indian Reinsurance'. Section 3 and 4 discuss 'Regulatory Framework' and 'Performance Appraisal of GIC' respectively. Section 5 concludes the study.

2. HISTORY OF INDIAN RE-INSURANCE

Prior to nationalization, the reinsurance market in India had a much diluted presence. The foreign companies operating in India were managing their risk portfolio with their overseas parent companies. Most of the domestic insurance companies were not very much bothered about their risk management as their business underwriting used to be on a safer class of the business. To safeguard the identified and limited risk of insurance companies, local companies created India Insurance Pool. (Tripathy and Pal 2005) In order to increase domestic retention, the Indian Guarantee & General Insurance Company Ltd. and India Reinsurance Corporation Ltd. were formed by the Indian insurers and government respectively. Each of these reinsurance companies received about 10% statutory cessions from insurers in India. This indirectly secured success and self-reliance of India Reinsurance Corporation, being a new entrant in the restricted and regulated environment (Palande et al. 2003).

In early 70s the entire general insurance business in India was nationalised by General Insurance Business (Nationalisation) Act, 1972 (GIBNA). The Government of India (GOI) took over the shares of 107 Indian insurance companies carrying on general insurance business. General Insurance Corporation of India (GIC) was formed in pursuance of Section 9(1) of GIBNA and it was incorporated on 22 November 1972 under the Companies Act, 1956 as a private limited company for the purpose of superintending, controlling and carrying on the business of general insurance. As soon as GIC was formed the Government of India (GOI) transferred, all the shares it held in different general insurance companies, to GIC. After a process of mergers among Indian insurance companies, four companies were formed as fully owned subsidiary companies of GIC (1) National Insurance Company Limited, (2) The New India Assurance Company Limited, (3) The Oriental Insurance Company Limited, and (4) United India Insurance Company Limited. (www.gicofindia.com). after formation, the GIC decided upon reinsurance programme for the Indian market. A program was drawn up taking into account the financial and operational skills of the four public sector insurers, with the objective of maximizing retention within the country. GIC controlled the obligatory cessions, market pool arrangements, market surplus treaty facilities and facultative placements of direct insurers. The property (large and listed) risks were underwritten on a market basis by the GIC and were communicated to the companies for accounting and record keeping.

In 1993, the Government set up a committee under the chairmanship of RN Malhotra, former Governor of RBI, to propose recommendations for reforms in the insurance sector. The committee submitted its report in 1994 wherein, among other things, it recommended that the private sector be permitted to enter the insurance industry. Following the recommendations of the Malhotra Committee report, in 1999, the Insurance Regulatory and Development Authority (IRDA) was constituted as an autonomous body to regulate and develop the insurance industry. In April, 2000 it was incorporated as a statutory body. On 19th April 2000, the Insurance Regulatory and Development Authority (IRDA) Act, 1999 came into force. This act also amended GIBN Act, 1972 and the Insurance Act, 1938. In December, 2000, the subsidiaries of the General Insurance Corporation of India were restructured as independent companies and at the same time GIC was converted into a *national re-insurer*. The General Insurance Business (Nationalisation) Amendment Act, 2002, (GIBNA) was passed by both the Houses of Parliament in July, 2002, and assented to by the President of India, on 7th August, 2002. With the General Insurance Business (Nationalisation) Amendment Act 2002 coming into force from 21st March, 2003, GIC ceased to be a holding company of its four subsidiaries. *(Palande et al.2003).*

Following the GIC's re-designation as the 'Indian Reinsurer' in terms of the Notification issued by the Government under Section 101(A)(8)(ii) of the Insurance Act, 1938 with effect from the financial year 2001-02, GIC divested itself of any direct business in India that it wrote prior to November 2000, except crop insurance. As a professional reinsurer GIC followed the goal of maximizing retention of the insurance business emanating in India while at the same time increasing the levels of acceptances from the international reinsurance markets. It currently manages Marine Hull Pool on behalf of the market, which receives a

cession from writing companies and after pool protection the business is retro-ceded back to the member companies. GIC also manages the 'Terrorism Pool'. (*www.aonglobal.com)* Recently the Corporation has also entered the area of reinsurance in life insurance business by setting up a separate department to cater to the specific reinsurance requirements of the life insurance business sector.

3. REGULATORY FRAMEWORK OF REINSURANCE IN INDIA

The General Insurance Corporation being a reinsurance company, its working and functions, are governed by the Insurance Regulatory and Development Authority (IRDA). The objective of these regulations is to maximise retention of premium within India, develop adequate capacity, ensure the best protection for the reinsurance costs incurred and simplify administration. Section 14(1) and 14(2)(f) of the IRDA Act, 1999 as well as Sections 34F, 101A, 101B and 101C of the Insurance Act, 1938, provide a mandate to the IRDA in respect of re-insurance. Given the importance of reinsurance, the Authority has framed following regulations:

- Placement of 20% of each policy with Indian Reinsurer subject to a monetary limit for each risk for some classes.
- Inter-company cession between four public sector companies.
- Indian Pool for Marine Hull shall be managed by GIC.
- The treaty and balance risk which are beyond capacity are to be first offered to other insurance companies in the market before offering it to international re-insurers.
- Every insurer should file its reinsurance programme for each financial year with the Authority (IRDA) at least 45 days before the commencement of the year.
- Not more than 10% of reinsurance premium to be placed with one re-insurer.
- No re-insurer will have a rating of less than "BBB" from Standard and Poor's or an equivalent rating from AM Best.
- Insurers must place their reinsurance business, in excess of limits defined, outside India with only those reinsurers who have a rating of at least BBB (S&P) for the preceding five years. This limit has been derived from India's own sovereign rating, which currently stands at BBB.
- Certain percentage of the sum assured on each policy by an insurance company is to be reinsured with the National Reinsurer. This has been made compulsory only in the non-life sector.
- Private life insurance companies cannot enter into reinsurance with their promoter company or its associates or GIC, though the LIC can continue to reinsure its policies with GIC.

- The insurer is further required to file the treaty slips or cover notes relating to the reinsurance arrangements with the Authority within 30 days of the commencement of the financial year.
- Every insurer should maintain the maximum possible retention commensurate with its financial strength and volume of business.

These measures highlight the existence of adequate and efficient re-insurance arrangements for an insurer because its solvency is assessed on a "net of re-insurance" basis. The Regulations also require the Indian reinsurer to organise domestic pools for re-insurance surpluses in consultation with all insurers. Every insurer needs a comprehensive and efficient re-insurance programme in order to be able to operate and remain solvent. The Authority desires that the re-insurance programme of every insurer should have the approval of its Board of Directors.

Under Section 6 of the Insurance Act, 1938, as amended by the IRDA Act, 1999, every re-insurer carrying on reinsurance business exclusively shall have a paid-up equity capital of Rs.200 crores. The GIC's existing paid-up equity capital of Rs.430 crores conforms to the specifications of the IRDA. The Accounts of the Corporation are drawn up according to the stipulations prescribed in the IRDA (Preparation of Financial Statements and Auditor's Report), Regulations, 2002. As per Section 101A of the Insurance Act, 1938 every insurer shall reinsure with the Indian re-insurer such percentage of the sum insured on each general insurance policy as may be specified by the Authority, which are also known as obligatory cessions or statutory cessions, with the previous approval of the Central Government, after consultation with the Reinsurance Advisory Committee.

Government of India is considering consolidation of different pieces of insurance legislation into one comprehensive enactment with further modifications in different areas of functioning in the light of experience gained ever since opening of insurance industry in the year 1999. Insurance Regulatory Authority has put up a draft Regulations on the Direct and Reinsurance Broking. Government of India is also considering a statutory codification for professionalizing (i) Surveyors and Loss Assessors and (ii) Actuaries. In India, the Finance Ministry is considering the end or relaxation in 26% FDI cap in relation to reinsurance companies. Since the capital requirement for reinsurance companies has been set at Rs 200 crores, the 26% cap would mean that the Indian partners would have to bring in Rs 148 crores for their 74% share. This requirement has prevented the establishment of reinsurance ventures in India even after four years of the enactment of the IRDA Act in 1999. Therefore, it remains to be seen whether reinsurance companies in India will be able to achieve a global spread or not. *(IRDA Guidelines 2004 and Editorial Team 2004).*

4. PERFORMANCE APPRAISAL OF GIC

4.1. Financial Performance

GIC's Financial Results
(Rs. in million)

Particulars	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Gross Premium	3832.79	4162.98	4613.87	4234.88	6420.87	8311.14
Net Earned Premium	3186.33	3991.79	4373.68	4458.84	5263.79	7228.96
Net Claims Settled	2744.40	2895.36	3702.80	4573.07	3622.71	6011.49
Net Commission	909.01	1071.64	1207.49	1102.93	1670.12	2089.65
Operating Exp. & other outgo less other income	21.91	42.15	35.67	43.01	46.91	55.21
Investment Income Apportioned to Revenue less Expenses	578.03	860.76	850.51	1095.70	1230.05	1287.28
Total (Profit/Loss)	89.04	843.40	278.23	-164.48	1154.10	359.89
Profit Before Tax	342.90	1276.91	800.08	442.94	1789.46	1067.30
Income Tax Deducted at source	81.43	239.29	600.06	-155.58	258.12	74.52
Profit After Tax	261.47	1037.62	200.02	598.52	1531.34	992.78
Profit available for Appropriation	281.66	1037.62	200.02	598.58	1531.36	992.82

Source: GIC annual reports

(Net Earned Premium is arrived after adjustments for Reserve for Unexpired Risks)

Since the emergence of GIC as a reinsurer, the gradual increase of gross and net earned premium receipts showed a steady growth. It is notable that gross and net earned premium receipts increased by 117% and 127% respectively in the year 2007-08 in comparison to the receipts of 2002-03. Operating expenses as a percent of gross premium underwritten worked out to more or less 1 percent throughout the last six years, indicating stabilisation of operating cost.

The percentage of claim incurred to net premium varied from year to year due to happening of catastrophic losses. The percentage rose to 103% in the year 2005-06, mainly on account of major catastrophic losses including Mumbai flood losses (July 2005); and in the year 2006-07 it was as low as 69% due to restoration of normalcy from the flood affected previous year and for moving towards de-tariffed regime in the general insurance business.

The profits in reinsurance business arise when the premiums earned from primary insurers exceed the claim settled against reinsurance. On the other hand, loss in reinsurance indicates that the claim paid due to losses were more than cessions received from the insurers. The increase in loss in 2005-2006 was mainly due to a change in the accounting policy

resulting in deferring of revenue of the fourth quarter of the year to the following year. Despite the GIC sustained operational/underwriting losses every financial year from 2002-03 to 2007-08, it could manage to earn profits on account of higher investment income. This indicates efficient restructuring of the portfolio management to suit the business environment, through underwriting training, skill development and share expertise gained from other countries.

Total assets of the Corporation increased to Rs.36, 012.83 crores as on 31st March, 2008 from Rs.11, 695.11crores as on 31st March, 2003. The total book value of investment of the Corporation in India (representing investments, loans and deposits) amounted to Rs.15,895.26 crores as on 31st March, 2008 as against Rs.8,622.98 crores in the year 2002-03. In the year 2002-03 GIC's equity capital was Rs.215 crores, which was enhanced to Rs.430 crores and this limit conforms to the specifications of the IRDA.

Foreign exchange earnings were enhanced from Rs.725.45 crores in the year 2002-03 to Rs.964.63 crores in the year 2007-08. Simultaneously Foreign exchange outflow was enhanced from Rs.586.71 crores in the year 2002-03 to Rs.821.43 crores in the year 2007-08. The earnings included all receipts denominated in foreign currencies in respect of premium, recovery of claims, outward commission and investment earnings. The outflow comprised all payments in foreign currency in respect of outward premium, claims on reinsurance accepted, commission and expenses of management. It may be mentioned here that GIC reported solvency ratio of 3.36 as on March 31, 2008 and 4.10 as on March 31, 2007.

4.2. Segment wise Performance

Fire

In the year 2007-08 Fire Insurance Business recorded a growth of 20%. The earned premium for the year was Rs. 1,751 crores as compared to Rs.1,341 crores in the year 2004-05. Claims settled stood at Rs.1, 644 crores. Major losses in India during the year 2007-08, affecting the books of GIC on net basis, were on account of Alok Industries– Rs. 50 crores. Losses amounting to Rs. 52 crores were reported under 'Foreign Inward' business on account of cyclone 'Gonu' in Oman. Major claims during the year 2005-06 in India were on account of Satlaj Jal Vidyut Nigam (August 2005), Mumbai flood (July 2005) & Baglihar Hydel Power Project (July & August 2005). GIC's shares of losses on these three major loss events were Rs 321 crores, Rs 650 crores & Rs 130.24 crores respectively. Major international losses in this class were Advance Semiconductors, Taiwan (May 2005), Hurricane Katrina (August 2005) and Hurricane Wilma (October 2005), with outflow of Rs. 28.53 crores, Rs. 18.14 crores & Rs. 7.54 crores respectively.

Marine

There was a substantial rise in 'Net Earned Premium' from Rs. 296.16 crores in 2004-05 to Rs. 401.62 crores in 2007-08.

Marine Cargo– On overall basis it continues to show growth in premium on account of large domestic project shipments together with marine consequential loss covers. This growth is more prominent on the facultative portfolio which reflects a 33% rise in premium in the year 2007-08 over the year 2006-07. GIC has started writing crude oil and related shipments; but the premium volume is small on account of aggressive rating. The expected increase in cargo rates in the domestic market following the de-tariffing of property business has not yet taken place although some stability in the rates is now observed. The year 2007-08 witnessed a huge loss for cotton storage in transit amounting to GIC's share of Rs. 5.57 crores. There is a substantial rise in Net Earned Premium from Rs.154.8 crores in 2006-07 to Rs. 233.2 crores in 2007-08. The growth trend in cargo business is expected to continue on account of large oil imports and increasing number of projects coming up in the power sector.

Marine Hull - Due to economic boom, there was a good demand for shipping tonnage. Consequently, many shipping companies are expanding their fleet size leading to modest growth of premium, although the premium volume is small on account of free market pricing. Net Earned Premium has enhanced from Rs. 126.3 crores (2006-07) to Rs. 168.3 crores (2007-08). GIC continues to administer the erstwhile Government Hull War Risks Scheme for Indian Flag Vessels and the rates were revised downward w.e.f. 1st July 2007 to make it competitive with international rates. In the year 2007-08, the foreign inward portfolio witnessed 3 major losses (amounting to more than Rs.5 crores) and in India one major loss of Rs.20.17 crores is estimated. Settled claim figure for the year 2007-08 is Rs. 288.9 crores. GIC plays an active role in giving the reinsurance support for such high-valued ocean-going vessels.

Oil and Energy

GIC's portfolio of off-shore energy business continues to show healthy growth both in domestic and international business. GIC's overall offshore energy premium for underwriting year 2007-08 is about US$ 21.50 million, which reflects an increase of 45% over 2006-07. The obligatory cession from April 2008 is 10% (previously 15%). With a view to maintain GIC's premium on large energy packages it is proposed to negotiate with domestic insurers for retaining the 5% line.

From January 2008, GIC's London branch has been given the similar underwriting capacity as the Head office to underwrite off-shore energy business. It is expected that with this the energy premium for GIC will get further boost. No major losses have been reported for the year 2007-08. With the rising crude oil prices resulting in increased activity in the exploration and drilling area, both in India & abroad, there is immense potential for reinsurance business by GIC.

Aviation

Earned premium for foreign aviation business of Rs. 262.87 crores (as against Rs. 296.15 crores in previous year) constituted 16.09% of the foreign portfolio of the company. Hard insurance market conditions and low global claims frequency for a long period attracted a , which led to increased capacities

and consequent soft insurance market conditions. The aviation portfolio of GIC remained relatively stable. Earned premium for domestic aviation in the year 2007-08 of Rs. 52.00 crores shows an increase at the rate of 58.15% in comparison to Rs. 32.88 crores in the year 2004-05. But a consistent level of airline hull losses throughout the year contributed to pressure on margins for the airline insurance markets. Aviation industry is nevertheless getting safer by the day. GIC's net losses from large airline accidents in 2007 amounted to Rs. 134.91 crores. The largest loss for the year 2007 involved TAM aircraft loss for which GIC's gross share of hull loss was Rs. 10.27 crores and liability reserve was Rs. 85.20 crores (net loss to GIC being Rs. 24.00 crores). Moreover, domestic aviation witnessed a Pawan Hans helicopter loss (27.09.2007) with GIC's share of Rs. 3.15 crores, and Jet Airways (ATR-72) loss (01.07.2007) with GIC's share of Rs. 6.50 crores.

Liability

Due to growing economy and better awareness, Liability insurance sector is witnessing a steady growth. Though Liability sector is not under tariff, there is a general downward revision of the rates. On a limited scale foreign inward business is also being accepted. Liability claims are generally of low frequency with high severity. Liability portfolio, which has been profitable, is witnessing increased claims under the financial lines. More claims under errors and omissions pertaining to IT companies are being reported in the market. GIC has settled a claim of Wipro amounting to Rs.7.70 crores

Life

The GIC has commenced full-fledged life reinsurance operations with effect from 1st April, 2003. Treaties have been entered into with domestic as well as overseas players. Efforts are on to forge relationships with new players on the domestic fronts in order to attract new business. GIC has taken initiative and looks to expand its operations in this area. Life insurance market in the country has seen phenomenal growth of 23% in 2007-08. GIC's life reinsurance portfolio has grown substantially with the earned premium for the year 2007-08 being Rs 9.50 crores as against earned premium figure of Rs. 1.51 crores for 2006-07, showing a growth of 529%. A revenue profit of Rs. 4.53 crores has been achieved for 2007-08 as against Rs. 0.90 crores for 2006-07.

Agriculture

GIC continued expansion of its agriculture reinsurance portfolio by providing reinsurance support to agriculture (crop/livestock) and weather insurance business of domestic as well as foreign insurers, under proportional treaties, stop loss contracts and facultative arrangements. The net reinsurance premium grew from Rs. 1.66 crores in 2006-07 to Rs. 27.3 crores in 2007-08, a growth rate of 1545%. The accepted claim for the year was Rs. 24.3 crores, resulting a claim ratio of 89%.

Foreign Business

From April 2002, GIC started accepting international treaty and facultative reinsurance business for its own account only, emerging as a preferred reinsurer in the Afro-Asian region. It led the reinsurance arrangements in the insurance markets of Maldives, Kenya, Nepal, Malaysia, and Mauritius. GIC has three overseas offices viz: 'Representative Office' in Moscow and Branch Offices in London and Dubai. It has also exposure in the share capital of Kenindia Assurance Company Ltd, Kenya, India International Insurance Pte Ltd, Singapore, LIC (Mauritius) Offshore Ltd, Mauritius, Asian Reinsurance Corporation, Bangkok, and East Africa Reinsurance Company Ltd., Kenya, for strategic reasons.

GIC was also able to quote successfully on the various reinsurance offers received from the international market. The World Trade Centre (WTC) attack on 11th September, 2001 affected to a large extent the renewals that came up subsequently. The hardening of the insurance and reinsurance markets led to very limited covers being available in the market. GIC was able to take advantage of the reinsurance capacity shrinkage to increase its foreign inward business. GIC did not cancel any of its reinsurance arrangements. On the other hand GIC increased its foreign inward premium income in the first year of its independent operation. GIC has renewed almost the entire existing reinsurance arrangements with higher shares and increased premium. Through effective marketing and communication strategies, GIC was also able to create significant awareness about its strengths and capabilities as a professional reinsurer in various target markets.

The net foreign inward premium of Rs.159.14 crores for the year 2001-02 over the previous year's Rs.46.97 crores translated to a growth rate of 238.8%. The paid claims were Rs.62.47 crores during the year 2001-2002 as against Rs 41.49 crores during the previous year. The net deficit after taking into account the incurred claims and the reserve strain stood at Rs. 80.51 crores for the year 2001-02 as against 12.58 crores in the year 2000-01. The percentage of net deficit to net premium increased to 50.59% in the year 2001-02 from 26.78% in the previous year. In the year 2005-06 net foreign inward premium and claim paid were enhanced to Rs.1,186.4 crores and Rs.991.17 crores respectively.

4.3. Credit Rating of GIC

International - A M Best, the international credit rating agency, has affirmed "A (Excellent) Financial Strength" rating of the Corporation. The affirmation reflects the Corporation's excellent financial position, conservative investment portfolio and the leading position in the Indian insurance market.

National - Indian credit rating agency *Credit Analysis & Research Limited (CARE)* also has reaffirmed 'AAA Claims Paying Ability' rating of the Corporation. Insurers with this rating have the highest financial strength to meet policyholders' obligations and impact of any adverse business & economic factors on the claims paying ability is minimal. *(GIC & IRDA Annual Report, 2007-08)*

4.4. GIC's Performance towards Retention of Adequate Capacity within India

GIC, being the national reinsurer, have been arranging reinsurance protection and maximizing retention within the country for last three decades. It also maintained focus on the Indian market building on the strengths and relationships developed painstakingly. In this context, following statement reveals the retention amount by GIC related to the four public sector insurer within India:

Statement of Total, Foreign and Indian Cessions (Rs. in crore)

Year/Company		New India Assurance	National Insurance Company	United India Insurance Company	Oriental Insurance Company
2004-05	Total cessions	1522.64	1073.88	871.00	977.80
	Foreign cessions	216.18	175.37	142.90	294.37
	Indian cessions	1306.46	898.51	728.10	683.43
	% of Indian Cessions to Total	85.80	83.67	83.59	69.90
2005-06	Total cessions	1665.02	953.62	991.02	1190.83
	Foreign cessions	233.49	74.42	98.41	384.74
	Indian cessions	1431.53	879.20	892.61	806.09
	% Indian Cessions to Total	85.98	92.20	90.07	67.69
2006-07	Total cessions	1653.54	1024.92	1043.39	1247.26
	Foreign cessions	223.56	3.20	171.27	343.39
	Indian cessions	1429.98	1021.72	872.12	903.87
	% of Indian Cessions to Total	86.48	99.69	83.59	72.47

Source: CAG Report No. PA 15 of 2008

(The figures relating to total cessions are compiled from the books of the Reinsurance departments of the companies)

This above table would show that the broad objective of maximum retention within the country has largely been achieved. However, GIC stated that there was further scope to improve retention levels within the country and that its capacity to underwrite and accept risk should be fully utilised by the companies. In National Insurance Company, foreign cessions during 2006-07 were abnormally low due to booking of cessions to foreign reinsurers through Indian brokers was treated as Indian cession.

4.5. Buyers' Perspective

In case of reinsurance, insurers are the buyers of reinsurance policies. From buyers' perspective, performance of GIC is very much satisfactory so far as settlement of claim is

concerned. Taking this factor into consideration, the credit rating agency CARE has rated GIC at 'AAA Claims Paying Ability'.

5. CONCLUSION

In recent years Indian insurance industry witnessed a metamorphosis in the legislative and regulatory aspects, premium tariff restructuring, induction of new market players and insurance intermediaries, formation of a new Terrorism Pool. All these are expected to have a profound impact on the subsequent years. The above are some of the catalyzing developments contributing to the orderly growth and development of the insurance industry. But one should remember that without the support of reinsurance, insurance industry can not grow. GIC as a national reinsurer is providing useful service to all insurance companies. The reinsurance business hinges on successful partnerships. As the Indian market is growing, the regulator and the players are expected to realise the advantages of the reinsurer as a partner rather than as a means of risk reduction only. If an insurance company relies too heavily on a weak reinsurer, it will be unable to meet heavy losses since the reinsurer itself might be insolvent. This could also result in lower sales of the insurance products as the customers might settle for investing in other options such as government securities and fixed deposits. Fortunately, our national reinsurer, i.e. GIC is strong enough to build the confidence of not only domestic insurers but also foreign insurers. This is evident from the performance analysis of GIC. Insurance companies should also harness the power of the technology to upgrade reinsurance. The Internet can be utilised for the passing on information to underwriters, supporting risk assessment and marketing. Finally we can conclude that India has a strong insurance market with the backing of a strong national reinsurer and a vibrant regulator like IRDA

REFERENCES

CAG (2008), Report No. PA 15 of 2008, Chapter 3 (22-34)

Editorial Team (2004), 'Reinsurance-Insuring the Insurer'. *The Chartered Accountant*, June.

GIC & IRDA (2001-02 to 2007-08), *Annual Reports* from 2001-02 to 2007-08.

IRDA (2004), *Guidelines on Reinsurance*, www.irdaindia.org.

Mishra, M. N. (2004), *Insurance-Principles and Practice.* S Chand and Company Ltd. New Delhi.

Motihar, M. (2007), *Principles and Practice of Insurance.* Sharda Pushtak Bhawan. Allahabad.

Palande, S., and Lunawat (2003). *Insurance in India– Changing Policies and Emerging Opportunities.* Response Books. New Delhi.

Sitanshu Swain (2009), India Inc's Reinsurance Pricing to Rise. *The Financial Express.* January 2.

Tripathy, N. P., and Pal, P. (2005), *Insurance– Theory and Practice.* Prentice Hall of India Pvt. Limited. New Delhi

www.aonglobal.com

Journal of
Business and Economic Issues
Vol. 1 No. 2 July 2009

The Role of Content, its Collaborative development, evaluation and process of dissemination among students in e-learning: An Empirical Study

Pranam Dhar and Aniruddha Nag***

ABSTRACT: E-learning is becoming an influential force in higher education today. Development of e-learning material or web-based training tools requires the collaboration of content writers, editors, experts, system designers, domain subject matter experts, and web developers. The present study discusses the role of Content, its enhancements to a web-based training architecture to enable collaboration among these contributors and method of dissemination. The collaborative content development system aims at analysis and determination of the level of the content which is generated by multiple authors as well as knowledge of the students. With the evolution of Internet, it became apparent to developers that this medium could do few more than static information and that it was capable. Collaborative content creation tools are very much necessary for any e- Learning system, where the content plays a vital role. Practically everyone in the Internet believes that "content is king" and "you need a good content". But very few webmasters or content writers have taken it seriously. There are still too many sites round which have no real content or simply monotonous. "The content is very important." The reason is quite simple; content is the thing that attracts viewers and retains their attention. Content is the backbone of any Learning Management System (LMS). And, perhaps the important aspect of collaborative content creation is that the content can be shared by all users in an interactive way. After brief review of the existing literatures available, it is clear that no structured study has yet been made on the collaborative development of content creation in smoothing up the e-learning process depending on the merit and reception capacity of the students. The present study is an attempt to determine the various components of Content, standard of the content as well as level of the student and according to their level contents are supplied. To determine the role of different multimedia components behind Content creation a neat sampling design process is required. This paper presents criteria for evaluating the pedagogical usability of digital learning material. In practice the role of the Content is to give the learner a chance to choose the most suitable learning material possible for any learning situation.

Key Words: *Content, Collaborative content development, domain, e-learning*

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1. INTRODUCTION

Time, distance and languages were always been hurdles for the formal education system. After the emergence of IT, the technological solutions like, developments in information, communication and computing technologies have made available powerful tools to a large sector of the population.

Video Conferencing, Satellite Applications, INTERNET and WWW etc started changing the life styles of modern population. In education system also, an environment in which, learning is facilitated by multidimensional, at one axis the content producer/deliverer and on the other end a learner with the help of software applications for teaching and learning, has been emerged. Obviously, these useful tools, which avoid several barriers leads to setting-up of digital/virtual/e-campuses or e-varsities for E-learning. Global connectivity must mean more than technology and commerce; it must lead to global learning, and the inculcation of values that set apart a civilized human being [1].

Shortage of skilled manpower, especially computer literate information professionals, is one of the basic problems a there are no courses available for training people in many areas. Very few people or personnel are available who strike a balance between content creation, organization and management. In a media organization, where the flow of information is enormous, it's difficult for a few people to organize and manage the content-both the online media and library. The management has to understand the need of digital media, as it is beneficial for the organization in future. Apart from this, there is a need to standardize the fonts for Content Creation and organization worldwide for the content to reach worldwide audience. There is also a need for query and retrieval, presentation of content in a standardized manner. [2]

The use of e-learning environments to support teaching and learning has had great impact on the way content is developed and managed. In most cases, both teachers and students have had to re-adapt the way they prepare access and engage with educational matter. [3]

Building and maintaining content collaboratively is difficult. The content is highly interdependent, is reused in modified form, changes rapidly, and there's a lot of it. Further, a small group of administrators is often responsible for managing a much larger pool of contributors. In order to scale, flexible content management capabilities are needed, along with high-level policies and techniques for using them effectively. This research work "Some aspects of collaborative content development, its evaluation in e-learning environments" aims to determine the standard of content which developed collaboratively by panel of content writers, editors and experts.

The present study discusses the role of Content, its enhancements to a web-based training architecture to enable collaboration among these contributors and method of dissemination.

2. PROBLEM DEFINITION

In the present study, the research problem, that has been identified, is to identify what we actually mean by "learning content", and to clarify the primary scope of content and its role behind E-learning.

The challenge is to develop learning content. Are all contents used for learning, or are they more restrictive? In many cases, they are not helpful as they provide little restriction on both what learning content is, or how it would have to be managed. From this research the focus is specifically on the quality of content and its different components.

3. WHAT IS AN IDEAL DIGITAL LEARNING CONTENT AND CONTENT DEVELOPMENT

Content is basically information that is available online. It is basically, the "message" rather than the "medium". The IEEE standardization draft [4] defined Learning Contents as - *"Learning Content is defined as any entity, digital or non-digital, that may be used for Learning, education or training"*.

An ideal digital learning content is that which has following distinctive features :

- Text, graphics, or interactive objects
- Presentation – format, fonts, colours, images and so on
- Structure – broken into several units and navigation of those units
- Context – application of content to a particular job or skill context,
- Pedagogy – strategies used to organise the content to affect and measure learning.

Digital learning Content increases opportunities for teaching and learning. In an online environment learning objects can increase course interactivity and give students additional opportunities to interact with a variety of learning content. Digital Content e.g. text, graphics, animation etc can provide opportunities for active learning, enrichment, remediation, and provide practice with the content students need to master.

Content development means, 'the creation and organization of the information presented in a product such as a web page'.

4. MEANING OF COLLABORATION

Collaboration simply means "working together." In Information System Management terminology, it means Systems and software that enable group participation in a problem or process. The term 'Collaboratively' is defined as to work together, especially in a joint intellectual effort. [5]

Collaboration includes the following functions:

- Jointly usable information databases
- Joint, simultaneous, controlled information processing
- Knowledge based on skills, resources and background data for joint information processing
- Communication application such as video conferencing
- Integration of information from other applications in the context of joint information processing

Collaborative content development systems are employed to handle large collections of written material concurrently generated by multiple authors.

5. OBJECTIVES OF THE PRESENT STUDY

In the light of the above discussions, the present study aims to fulfill the following objectives:

- To highlight the basic issues relating to the Digital Learning material.
- To find out the usefulness of Content in respect of information, overall presentation and multimedia components.
- To test different factors affecting the selection of content such as clarity, appearance, interactivity etc. in e-learning.
- To present a SWOT analysis of the various elements of Content.
- To study the standard e-Learning system.
- To design the web based server side program to upload the file into server and to store the content developed by experts into server database.
- To design collaborative content evaluation software and integrate with existing Learning management system.
- To analyse and investigate the methodology of Content Evaluation.
- To explore possibilities of determining the level of knowledge of a student and to provide him Content according to his standard.

6. SCOPE OF THE PRESENT STUDY

Building and maintaining content collaboratively is difficult; the content is highly interdependent, is reused in modified form, changes rapidly, and there's a lot of it. Further, a small group of administrators is often responsible for managing a much larger pool of contributors. In order to scale, flexible content management capabilities are needed, along with high-level policies and techniques for using them effectively. This research work "The Role of Content, its Collaborative development, evaluation and process of dissemination among students in e-learning – An Empirical Study" aims to determine the standard of content which developed collaboratively by panel of content writers, editors and experts. In addition, it aims to determine the level of knowledge of students and their capability of gathering knowledge. Before studying content from the system some questions will be asked to a student. After getting student's answer the system will analyse his/her accessing power and level of merits. In this way the system will evaluate the student's knowledge and decide the level on which he/she has to be taught and accordingly that type of content will be supplied.

7. BRIEF REVIEW OF THE AVAILABLE LITERATURE

After careful hunch of the available literature on the role of content and its development in e-learning, both in foreign and Indian context, the following literatures are available which are presented in brief through the following lines :

Content management systems nowadays are used to manage complex publications far more often than some years ago. The basic principles are the separation of structure, content and presentation, an exactly defined workflow management and the management of content in the form of small units, so called assets. This leads to improved quality, better reusability and reduced costs. We focus on similarities of CMS-systems and e-learning systems and the possibility to transfer gained experiences from the field of CMS to e-learning systems [6].

Collaborative content development systems are employed to handle large collections of written material concurrently generated by multiple authors.

A network based infrastructure allows members of a group to interactively and simultaneously create, review and edit product documentation, web content, or other interrelated documents on time and in real time [7].

Collaboration begins with the unification of content. You need to figure out "what's going on "with your content, how it's being used, how it's being managed, as well as the processes you use to create, publish and store it.

Then you need to perform a content audit. During a content audit, you look at your organization's content analytically and critically, allowing you to identify opportunities for

reuse and the type of reuse. What the best processes for creation are and how the use of collaborative technologies may expedite these processes. [8]

Content development plays a key role in e-learning. Designing of content with good interactivity is essential for an effective teaching and learning system. Development of such an interactive content is not an easy task for the instructors. It requires a collaborative work among experts from various fields. [9]

Content refers to online training, that provides courseware, and knowledge management that provides informational databases and support tools (Rosenberg, 2001).

Successful e-learning countries have access to content including library materials, newspapers, corporate information, government databases etcetera, online in their native language (EIU, 2003).

Developing e-learning content for a big heterogeneous group of people is a great difference from developing paper-based course material for a small group of known people. (Tozman, 2004).

According to Grady Booch, "Collaboration has always been an essential part of the fabric of the Internet, E-Mail, instant messaging, content, chat, discussion groups, and Wikis are common collaborative elements that have matured over time collaboration among teams is already facilitated through the use of an increasing number of features embedded in standard desktop products such as office suites, shared document reviews, distribution of documents among teams and mechanism for performing common collaborative tasks. (Booch 2005).

8. RESEARCH GAP AND RESEARCH QUESTIONS

The purpose of the Current research is to understand the most important factors behind a *good-quality Content* and its effect. In addition to that collaborative development of software based on the factors extracted from survey and methods of dissemination is another important part of the research.

But from the minute study of the literatures available on the subject (as mentioned above), it becomes crystal clear that, no structured study has yet been made on the collaborative development of content creation in smoothing up the e-learning process depending on the merit and reception capacity of the students, specifically in Indian context.

Therefore, the present study raises the above research issue by highlighting the following research questions:

- What is the significance of Content in e-learning?
- What are the important criteria behind good quality content?

- Is Content a deciding factor for e-learning?
- How effectively judge the knowledge level of students?
- The answer to the question could lead to a better understanding of how to develop quality Content for e-learning and right method of dissemination among students.
- This research work aims to determine the standard of content which developed collaboratively by panel of content writers, editors and experts.
- In addition, it aims to determine the level of knowledge of students and their capability of gathering knowledge.
- Before studying content from the system some questions will be asked to a student.
- After getting student's answer the system will analyse his/her accessing power and level of merits.
- In this way the system will evaluate the student's knowledge and decide the level on which he/she has to be taught and accordingly that type of content will be supplied.

9. RESEARCH METHODOLOGY OF THE PRESENT STUDY

For the convenience of the study, the present study is sub-divided into two phases or stages.

In Phase 1, a sample survey conducted on the effectiveness of the contents and their understanding among the students who use them.

In Phase 2, with the result of that survey I have tried to develop a Collaborative Content Development Software (CCDS) which takes input collaboratively from different persons and disseminate among students according to their standard.

9.1. Nature of Data and Data Source

The data is basically primary in nature. It would be obtained from the Male and Female students of Computer Background of different Under Graduate and Post Graduate Colleges of West Bengal based on the official directory of colleges and universities published by the Department of Higher Education, Govt. of West Bengal, WBCUTA and different other relevant official websites.

9.2. Data Collection Methods

The Communication approach is basically structured Questioning, i.e. Personal Interview with the aid of Printed Questionnaires. Two sets of separate questionnaires have been prepared – one on the contents of CD-ROM and another on the contents of WEBSITE. Each set has 13 and 14 questions respectively.

9.3. Method of Sampling and Sample Size

Here, for the purpose of study, random sampling technique should be followed. Respondents Sample size is to be at least 2000 students, 1000 students each for CD-Rom and Website presentation.

9.3. Techniques of Analysis

This research work comprises the following techniques - Principal Component analysis, Factor analysis and 10 point Multiple Regression. These tools are used for showing the impact of various factors on the contents of Digital Learning Material.

After collecting samples, Principal Component and Factor Analysis techniques have been applied for finding Individual co-relation of each factor of e-learning material and an attempt is to be made to find out, which factors are most important. Factor analysis can be considered as an extension of Principal Component analysis.

Evaluation in this research is a subjective judgment made by the users of digital learning material. Factor analysis has been done for showing the Visual elements of the Content of the Digital learning material. *The evaluation criteria are applied using a self-evaluation questionnaire that employs an interval scale and Likert scale .eg. 10-(Very Satisfied),8-(Satisfied), 6-(Neutral), 4-(Dissatisfied) and 2-(Very Dissatisfied).*

Though, most of the measurement scales used to measure Content's feature to depth by respondents on a scale of 1 to 10 can be treated as Interval scales. Multiple Regression tools have been used to find out the role of independent factor/factors over dependent factor. I have also used ANOVA, which is a well-known technique for examining the differences among means for two or more populations. This technique I have used to find cause-and-effect of one or more factors (Independent variables) on a single dependent variable.

PHASE–I OF THE STUDY

10. DETAILED STATISTICAL ANALYSIS

10.1. Analysis in case of CD-ROM

From the available data, I have made the following Statistical analysis in case of CD_ROM used by the users:

- Multiple Regression
- Analysis of Variance
- Principal Component Analysis
- Factor Analysis

The detailed analysis is presented below:

Regression 1

Variables Entered/Removed (b)			
Model	**Variables Entered**	**Variables Removed**	**Method**
1	GOODVISUAL, INTERACTIVITY, HIGH QUALITY DESIGN, EASY INTERACTIVITY, EASY LANGUAGE(a)		Enter
a. All requested variables entered			
b. Dependent variable: SATISFACTION			

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.516 (a)	.266	.191	1.1835
a Predictors: (Constant), GOOD VISUAL, INTERACTIVITY, HIGH QUALITY DESIGN, EASY INTERFACE, EASY LANGUAGE				

ANNOVA (b)						
Model		**Sum of Squares**	**df**	**Mean square**	**F**	**Sig.**
1	**Regression**	24.897	5	4.979	3.555	.088(a)
	Residual	68.630	49	1.401		
	Total	93.527	54			
a Predictors: (Constant), GOODVISU, INTERACT, HIGH QUDE, EASYINTE, EASYLANG						
b Dependent Variable: SATISFACTION						

Coefficients(a)						
		Unstandardized Coefficients		**Standardized Coefficients**		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	**(Constant)**	4.462	.817		5.459	.000
	HIGHQUDE	-2.807E-02	.125	-.042	-.225	.823
	INTERACT	-5.967E-02	.166	-.077	-.359	.721
	EASYINTE	.350	.184	.444	1.899	.063
	EASYLANG	1.591E-02	.211	.021	.076	.940
	GOODVISU	.122	.149	.177	.814	.420
a Dependent Variable: SATISFACTION						

10.1.1. Results of the Regression Analysis

The output of the regression model is analysed below:-

According to this a (intercept) = 4.111

B1=.214; B2= -.045; B3= -.032; B4= -.075; B5=.116

It can be written as follows:

Satisfaction = 4.111+.214(Clarcont) + (-.045) (Visuappeal) + (-.0.32) (Qualinfo) + (-.075) (Colortypefont) +.116(Interactivity)

Now, from the Statistical significance, R Square value and Beta value indicate that Clarity of Content, Interactivity and Colors Type and Font are significantly significant in the model. The other 2 independent variables are individually not significant and to prove this I have done Stepwise regression also and that clearly indicate the aforementioned observation. When I have added one by one variable then it shows the change of R , R square and Adjusted R square value. And it also indicates that the change is very significant in case of Clarity of Content, Interactivity and Colors Type and Font but not at all significant in case of Visual appeal and Quality of Information. So, at the time of developing e-learning Content expert and developers look at the relationship of Satisfaction with one of these variables or all variables.

10.1.2. Results of the Factor Analysis and Principal Component Analysis

The output of Factor Analysis is obtained by requesting Principal Component analysis and specifying the rotation. For the Principal Component analysis, we have taken 6 factors as a part of the Content in CD-ROM as an e-learning tool. These factors are Subject Matter, Font Colour, Style, Text size, Grammar, Background Voice and Information.

There are two stages in Factor analysis. Stage one, as we know, is Factor extraction process. As evident from the tables presented above, we have found (from cumulative % column), that, 2 factors extracted together account for 59% of the total variance.

In component 1, it is evident from Component Matrix that Grammar, Background voice and Information have the highest loading of .741, .698 and .715 and this is reflected in Component plot in Rotated Space and Rotated Component Matrix also. This Factor consisting above three variables can be termed as *"Content Depth"*.

In component 2, it is evident from Component Matrix that Font color and style and Text size have the highest loading of .627 and . 570 and this is reflected in Component plot in Rotated Space and Rotated Component Matrix also. This Factor consisting above two variables can be termed as *"Content Layout"*.

10.2. Analysis in case of Website

Next we have analyzed the result of Website Survey. We have run two regression equations on Website. For the first case I have taken SATISFACTION as an Dependent variable and GOOD VISUAL, INTERACTIVITY, HIGH QUALITY DESIGN, EASY INTERACTIVITY, EASY LANGUAGE are independent variables.

In next regression we have tried to find Content is dependent on which variables most. For the Second case I have taken CONTENT as an Dependent variable and VISUAL APPEAL, AESTHETICS, CLARITY, CONCISE and VISUAL CONTINUITY are independent variables.

From the available data, we have made the following Statistical analysis in case of WEBSITE used by the users:

1. Multiple Regression
2. Principal Component Analysis
3. Factor Analysis
4. Analysis of Variance

This detailed analysis is presented in below.

Regression 2

Variables Entered/Removed			
Model	Variables Entered	Variables Removed	Method
1	Visually appealing, Aesthetic, Clarity, Concise, Visual Continuity [a]	.	Enter
a. All requested variables entered.			

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.512[a]	.263	.187	1.187
a. Predictors: (Constant), Visually appealing, Aesthetic, Clarity, Concise, Visual Continuity				

Model Summary					
	Change Statistics				
Model	R Square Change	F Change	df1	df2	Sig. F Change
1	.263	3.489	5	49	.009

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.583	5	4.917	3.489	.009[a]
	Residual	69.053	49	1.409		
	Total	93.636	54			

a. Predictors: (Constant), Visually appealing, Aesthetic, Clarity, Concise, Visual Continuity

b. Dependent Variable: Content

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.741	1.014		4.674	.000
	Clarity	.168	.161	.194	1.040	.303
	Visual Continuity	.053	.159	.067	.332	.741
	Aesthetic	.048	.147	.055	.325	.747
	Concise	-.242	.169	-.288	-1.432	.159
	Visually appealing	.315	.142	.447	2.223	.031

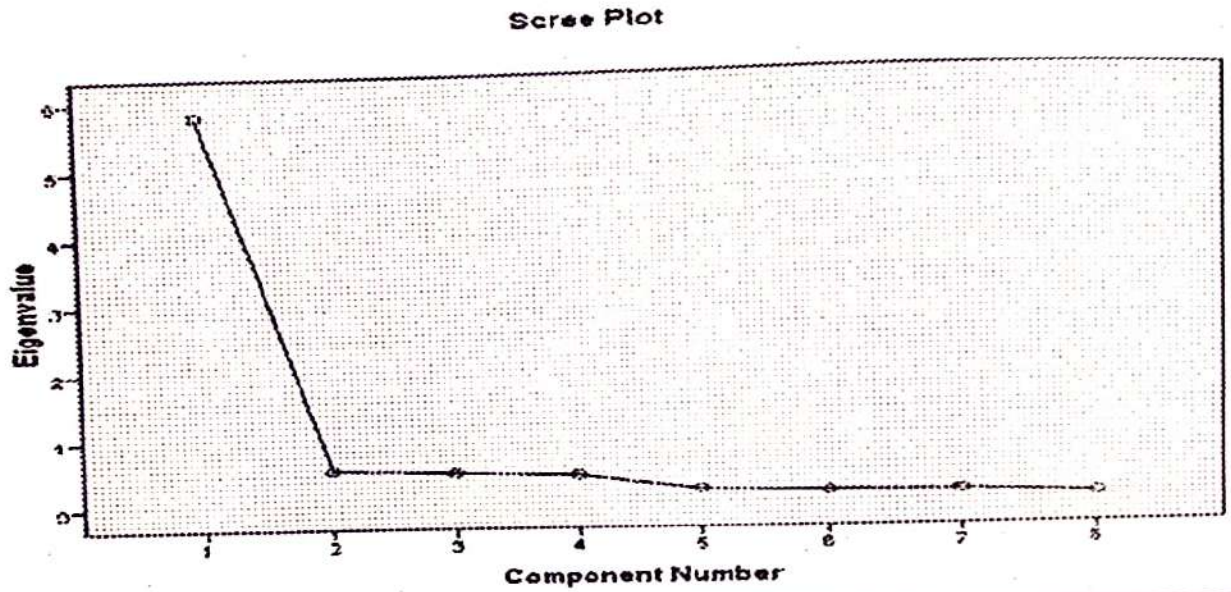
a. Dependent Variable: Content

Coefficients[a]

Model		Correlations		
		Zero-order	Partial	Part
1	Clarity	.427	.147	.128
	Visual Continuity	.304	.047	.041
	Aesthetic	.231	.046	.040
	Concise	.192	-.200	-.176
	Visually appealing	.452	.303	.273

a. Dependent Variable: Content

Factor Analysis



Warnings
Only one component was extracted. Component plots cannot be produced.

Component Matrix[a]	
	Component
	1
Colour scheme	.839
Image	.906
Animation	.914
navigation	.824
page Layout	.846
Relevance	.868
Readibility	.789
Font type	.825
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

There are two stages in Factor analysis. Stage one as we know is Factor extraction process. As evident from the above tables, I have found that (from Cumulative % column) 1 factor extracted which alone accounts for 72.64 of the total variance. It is evident that only one component has the Eigenvalue more than 1.

In component 1, it is evident from Component Matrix that all these attributes are highly loaded on the single factor .These attributes are highly co-related with each other .As they are of all in the same nature and highly interrelated. And that's why Component plot in Rotated Space can not be drawn .Therefore this Factor can be interpreted as *"Overall Presentation"*.

10.2.1. Results of the Regression Analysis

The outputs of the regression model are depicted in the tables presented in Appendix-II.

According to this a (CONSTANT) = 4.462

B1= -.028; B2= -.060; B3= .350; B4= -.016; B5= .122

It would be written as follows:

Satisfaction = 4.462 + (-.028) (Highqualitydesign)+(-.060)(Interactivity) + .350 (Easy interface) + (-.016) (Easy language)+ .122(Good visual).

Now, from the Statistical significance, R Square value and Beta value indicate that Easy Interface, Good Visual and Easy Language are significantly significant in the model. The other 2 independent variables are individually not significant and to prove this I have done Stepwise regression also and that clearly indicates the aforementioned observation. When I have added one by one variable then it shows the change of R , R square and Adjusted R square value. And it also indicates that the change is very significant in case of Easy Interface, Good Visual and Easy Language but not at all significant in case of High quality design and Interactivity. Among these three, Easy Interface is the most important factor. So at the time of developing e-learning Content, Content expert and developers look at the relationship of Satisfaction with one of these variables or all variables.

10.2.2. Results of the Factor Analysis and Principal Component Analysis

The output of Factor Analysis is obtained by requesting Principal Component analysis and specifying the rotation. . For the Principal Component analysis, I have taken 8 factors as a part of the Content in WEBSITE an e-learning tool. These factors are:

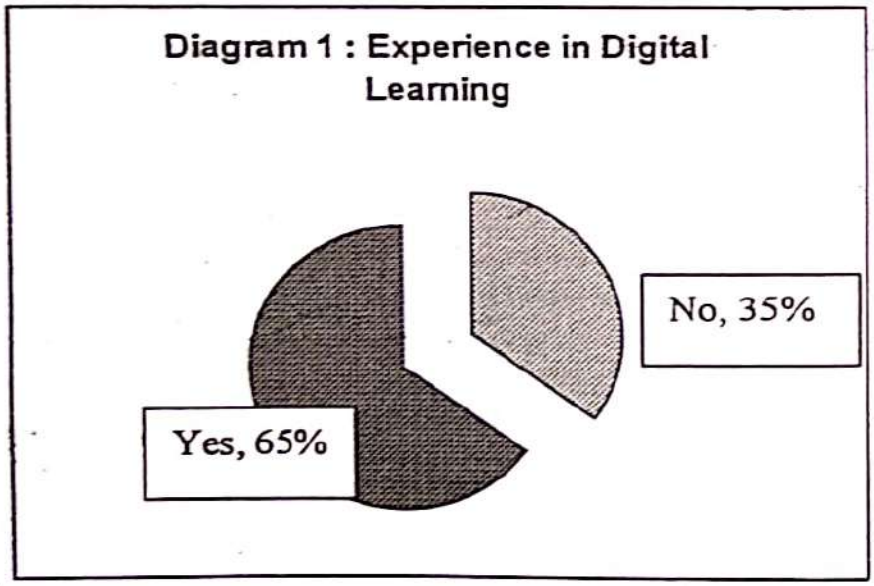
Colour scheme, Image, Animation, navigation, page Layout, Relevance, Readability and Font type.

There are two stages in Factor analysis. Stage one as we know is Factor extraction process. As evident from the APPENDICES, that (from Cumulative% column) 1 factor extracted which alone accounts for 72.64 of the total variance. It is evident that only one component has the Eigenvalue more than 1.

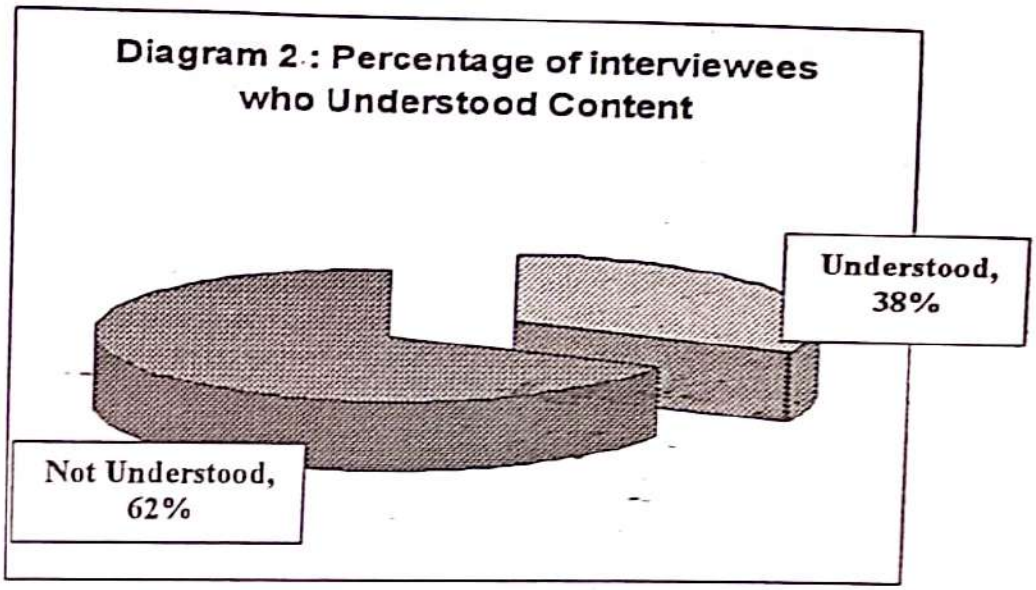
In component 1, it is evident from Component Matrix that all these attributes are highly loaded on the single factor .These attributes are highly co-related with each other .As they are of all in the same nature and highly interrelated. And that's why Component plot in Rotated Space can not be drawn .Therefore this Factor can be interpreted as *"Overall Presentation"*.

10.3. Graphical Analysis

Last but not the list, the following two Pie Charts will reflect the another findings on the basis I have developed software. The first Pie Chart shows that majority of student has previous experience and knowledge of digital Content in any form because in the Questionnaire 65% says 'Yes' and remaining 35% says 'No'.



From the interviewers filling up of questionnaires, 38% have said that they have understood and 62% have opposed to the point, which is shown through the following Pie Chart. In the above chart it shows that the majority of the students has previous experience of e-learning, in spite of that majority of the students have failed to understand the Content of my presentation which is based on their known subject .That result is shown in the next Pie chart).



It reflects that students of different merit and standard demands different Content according to their level on the same subject. Seeing the above results, I feel there is a need for an alternative technique for demonstration.

11. DETAILED CONCLUSIONS AND RECOMMENDATIONS

This study gives an idea about the important quality factors/parameters which are important for e-learning. More researchers in future will make the process of digital learning and its contents more meaningful by widening its working area. From the experience that we have gained from the above survey, we thought of developing, and, finally, developed, a software, keeping in view of the respondents' answers. We honestly believe that there are dependencies between teaching materials quality and e-learning. There are two parts collaborating with each other which are system developer and content provider, The former one provides an open and cross platform for teaching materials presentation. The later one provides different teaching materials to let students are users to use and share.

PHASE–II OF THE STUDY

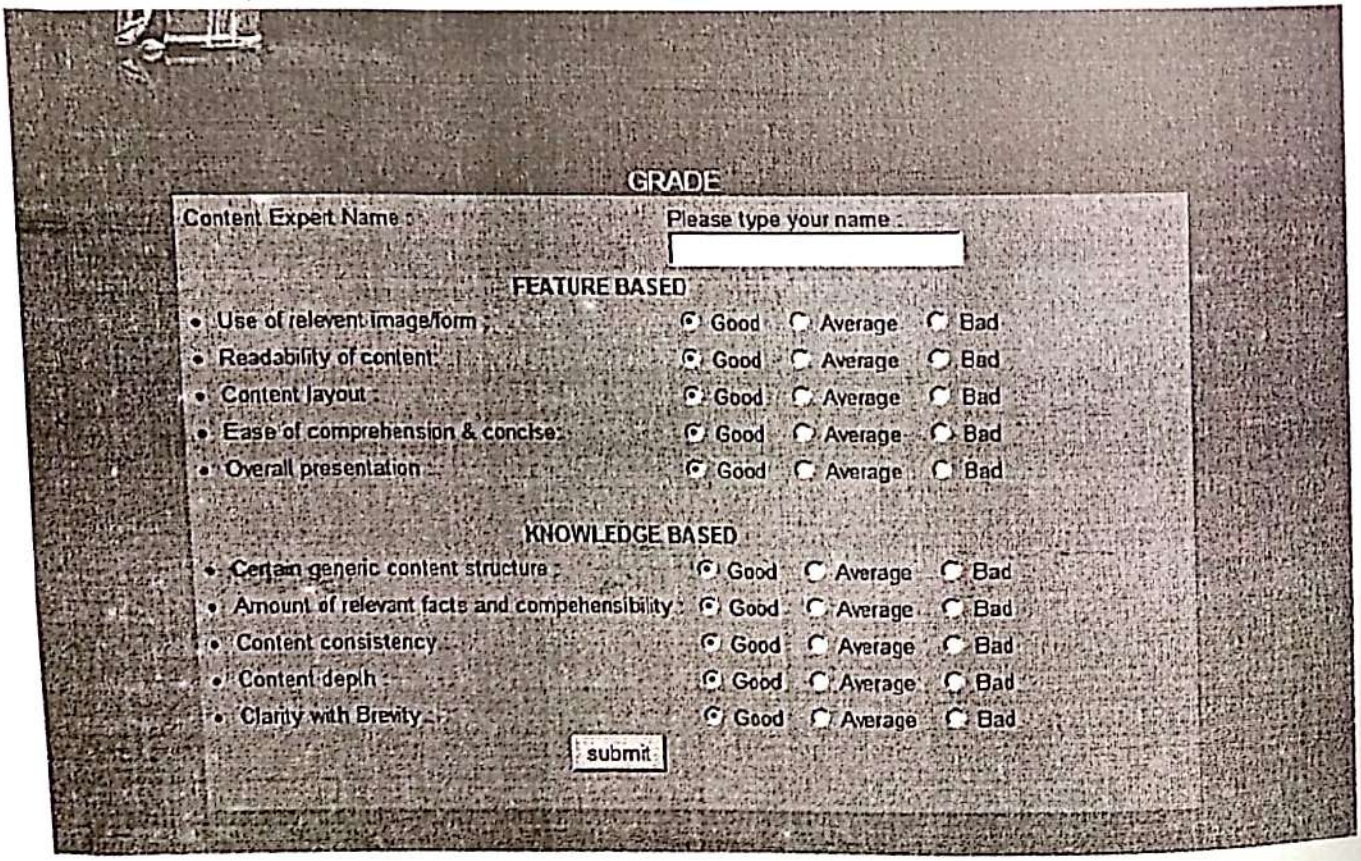
In this phase of the study, we have thought of developing a software keeping in view the experience that I have gained from the above survey and also depending on the respondents' answers. This type of Software is not available in the market because here with the help of CCDS (the name of the software), we can develop different qualities of content for different level of students. Commonly available softwares are dealt with the Content level but this software simultaneously analyzes the level of the students. In addition to that it sends Content to students according to their standard unlike sending a static Content to each and every one.

In this software all marks have been obtained in different tests will be stored in backend database. On the basis of the marks obtained in tests the system will calculate in database and generate the exact grade of the content. In addition to that, system will also generate the exact level of knowledge of student and according to the level of the student, contents of the same type supplied by LMS. After analyzing primary data using various techniques, software is to be developed.

The software is developed for Collaborative Content development and its proper evaluation based on the parameters suggested by the students in response against Questionnaire. Accordingly, the name of the software will be Collaborative Content Development Software (CCDS)

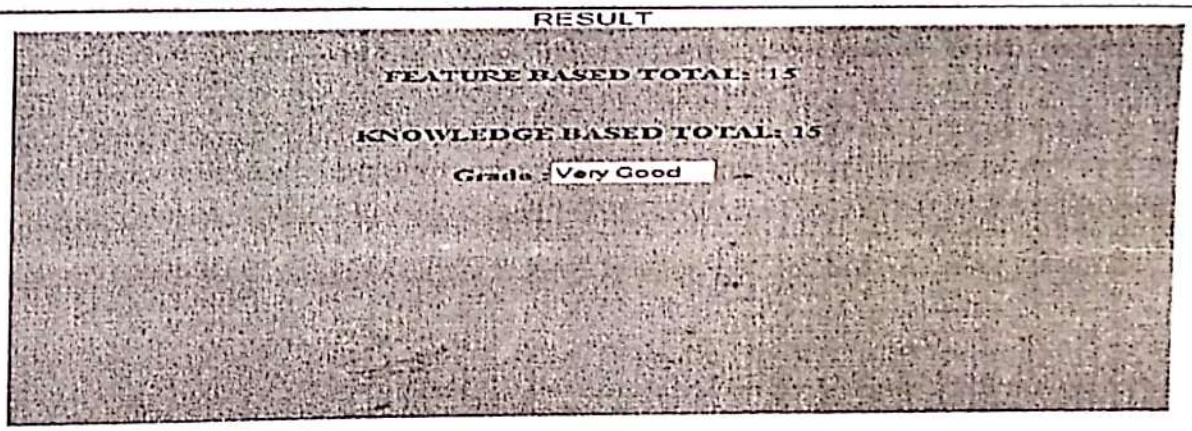
Finally the software depicted here is to be designed by PHP and database to be designed by MySql.

DESIGN OF THE SOFTWARE



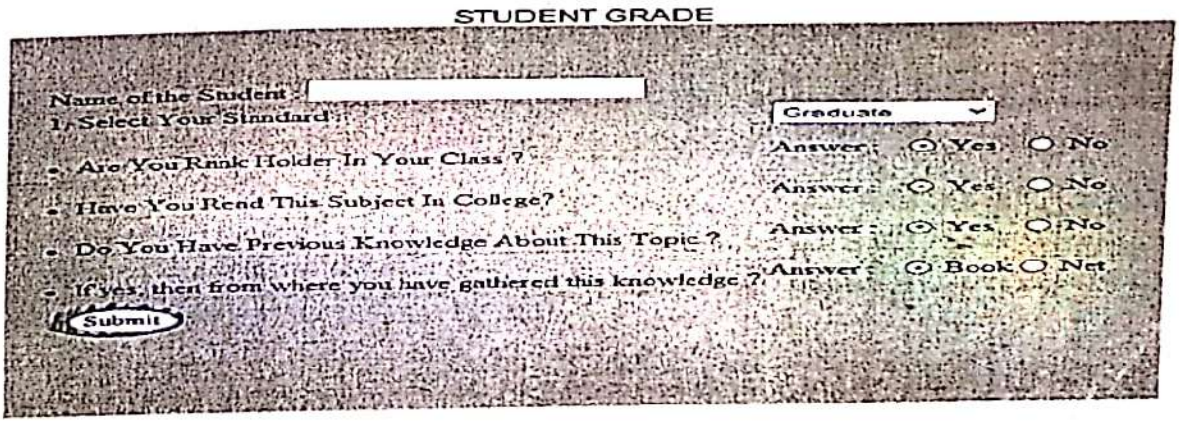
SCREEN - I

In screen 1, each Content Expert decides the level of content according to its level and knowledge. It is necessary because many knowledge bases fail due to insufficient quality of their content. Typical problems of such repositories are inconsistent formats, inaccurate and ambiguous conclusions. Since many corporate as well as student knowledge bases lack adequate validation mechanism, they become trapped in a vicious cycle of decaying content quality. As a consequence, the knowledge base loses its credibility and acceptance with the relevant users. To prevent this phenomenon content expert judge the content against ten parameters and after clicking "Submit" button this test's mark will be stored in database.



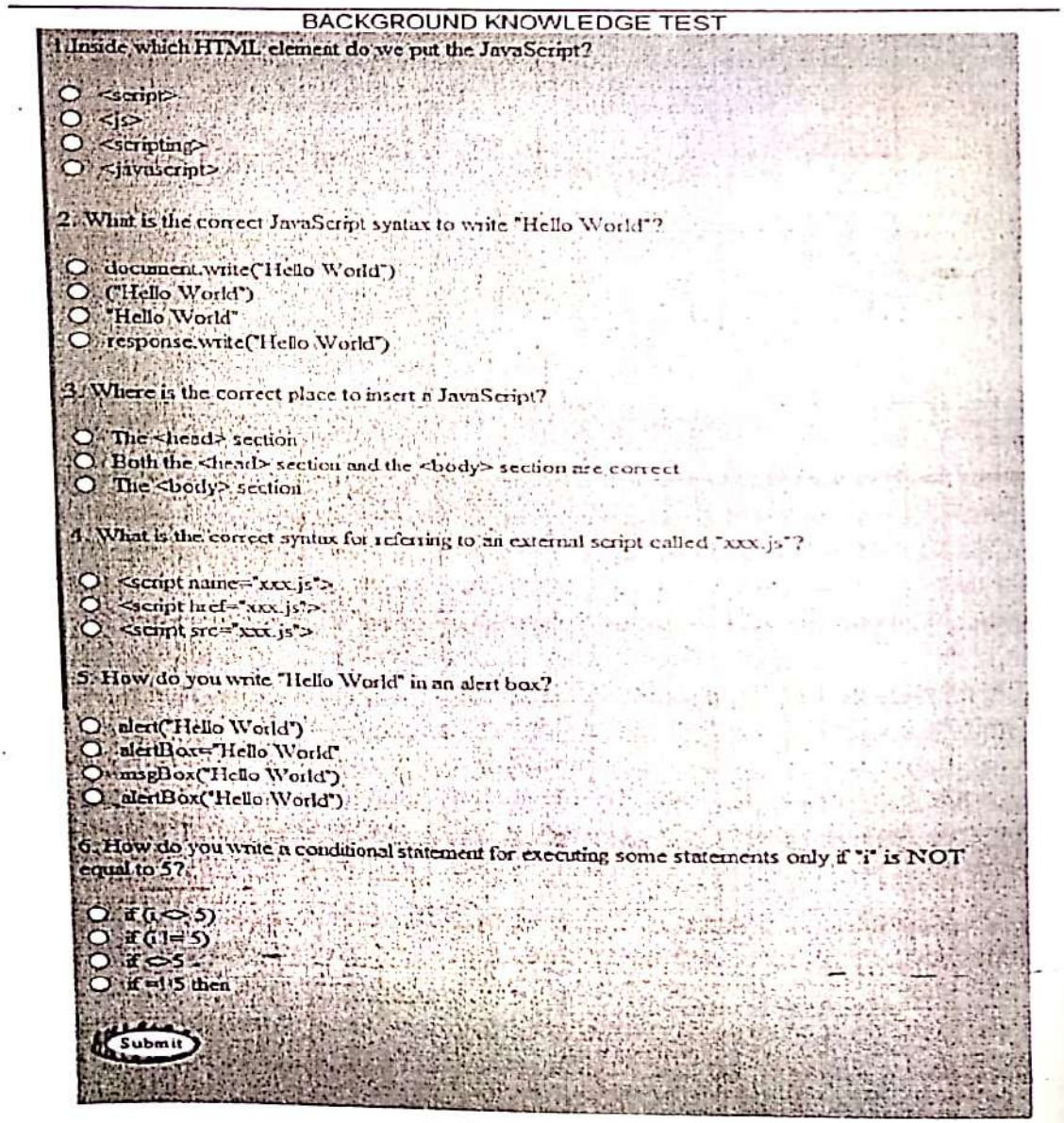
SCREEN - 2

In screen 2 , result (which is calculated in database) is shown as number as well as grade of the particular content.



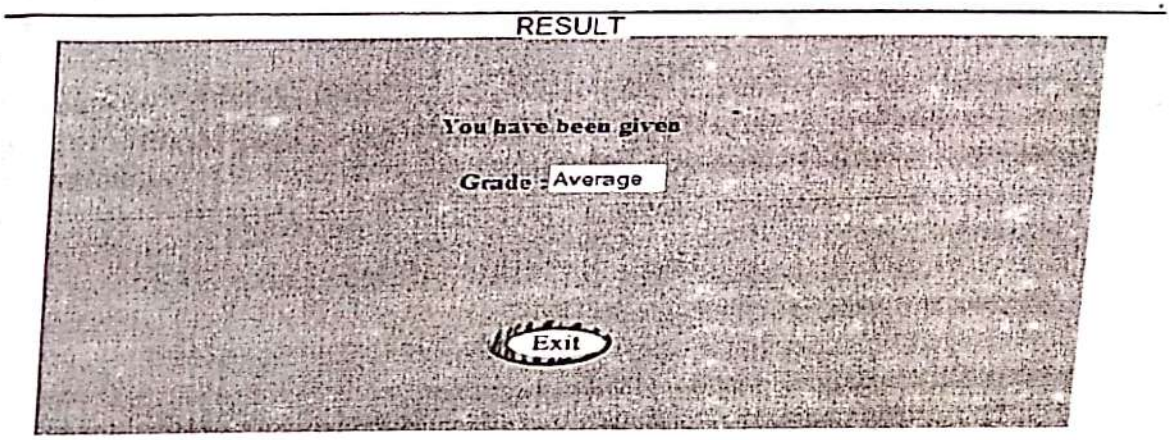
SCREEN - 3

In Screen 3, each student has to enter his/her previous qualification; his/her rank and whether possess any previous knowledge about the subject which is going to learn. After clicking "Submit "button the marks will be stored in database.



SCREEN - 4

In screen 4, each student has to give background knowledge test on that particular subject whether he/she has some previous knowledge on that particular subject or not. If in the previous case(in screen 3) , he intentionally or by mistake ticks all 'yes' without knowing a little bit about the subject then he will be properly judged here. After clicking "Submit" button these marks will be stored in database.



SCREEN - 5

In Screen 5, finally software shows the result (which is calculated in database) is shown as grade of individual student. After clicking exit he/she exits from the screen .And if clicks continue then he/she will get the content according to his/her standard.

12. END NOTE

The awareness of e-learning has to be increased among Graduate and post Graduate students to increase the quality of e-learning .In undergraduate syllabus of Engineering and management, many new subjects have been introduced by different universities of the world and India as well. But even then, most of the colleges follow traditional classroom teaching Methodology for all the subjects included in the syllabus. At least one subject in one semester should be introduced which students will learn without the help of teacher. This will generate feedback and improve the overall quality of e-learning process by increasing productivity through development of user's awareness in e-learning.

REFERENCES

Menon, M. G. K, (2001), T*ransformative Synthesis of Education and Information Technology.* (Address at the 12th convocation of IGNOU held at New Delhi on 3rd March 2001), University News, 39(27), 2-8, 13-17.

Ganesh, A. C., and Tamizhchelvan, M. (2007). Content Creation, Organization and Management: Transitions Time for Information Professionals. Workshops on Information Resource Mangement, RTC, Bangalore.

Mwanza, D., and Engeström, Y. (2006). *"Managing content in e-learning environments".* University of Helsinki's Centre for Activity Theory and Developmental Work Research. , University of Helsinki.

Bergstedt, S., Wiegreffe, S., .Wittmann, J., and Moller, D. (2006), *Content Management Systems and e-learning systems -a symbiosis.,* Dept. of Comput. Sci., Hamburg Univ, Germany.

Bergstedt, S., and Wiereffe, S., op. cit., 67-73.

Beck,.E., and Bellotti, V. (1993), Informed opportunism as staratezy :Supporting coordination in distributed Collaborative writing. Proceedings of ECSCW'93 .London Kluwer Academic Publishers, 233-248.

Ann Rockley and David Coleman, (October 2000), "C*ollaborative Content Management".*

Jegan, T.. & Eswaran, C., (2004). *Patterns for e-learning content development.* Journal of Interactive Learning Research. Norfolk, VA: AACE15 (2), 117-133..

Jegan, T., and Eswaran, C., op. cit., *.123.*

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