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**VIDYASAGAR UNIVERSITY**

**Amiya Kumar Dev**  
Vice-Chancellor

D. O. No. VU/VC/73/96

28 March 1996

Dear Professor Pande,

I am glad to hear that you are bringing out the first issue of your journal soon. I appreciate its scope and accommodation to students. I am sure it will give them an inspiration to do their own thinking.

I wish your journal a long life.

With regards,

Yours sincerely,  
Amiya Kumar Dev

Professor D. P. Pande  
Editor-in-Chief  
Vidyasagar University Journal of Commerce  
Department of Commerce with Farm Management  
Vidyasagar University, Midnapore.

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Midnapore 721 102 West Bengal  
Telephone 03226 (office) 62329 (home) 63202  
Fax (01) 03226 62320

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# EDITORIAL

We express our profound thanks to the Vice-Chancellor and other authorities of our beloved University for funding publication of the first issue of this research journal. In fact this was long awaited and should have published much earlier. Due to some uncontrollable but obvious reasons it has been delayed for which I shoulder all the responsibilities on behalf of my colleagues in the Editorial Board.

We know that the basic objectives of commerce education amongst others are (a) to prepare and develop the required manpower for trade and industry; (b) to train teachers and other research workers in different areas of commerce; and (c) to train persons for many other allied activities. In recent years the importance of commerce education has increased manifold in our country due to higher growth of industrial and commercial activity which in turn is the result of deliberate policy pursued by the Government and perhaps the necessity of a developing situation. All these indicate that commerce should be practise-oriented and research based with fuller knowledge in theoretical background. With that view in mind the Department of Commerce with Farm Management has initiated the publication of a Journal which could be of many use to the society at large.

The present issue contains 9 papers in all—7 in the General Section and 2 in the Students' Section. All the papers are well written and subjected to blind review and duly recommended for publication by renowned academicians in the country. The themes of the papers covered many areas like accounting and finance, taxation, farm accounting and also different aspects of macro and micro economics. Enthusiasm and active co-operation which we have got from our colleagues from different colleges affiliated to this University, will help us to bring out the forthcoming issues positively with better quality and contents in future.

May I now draw the attention of the readers to 'Notes to contributors' published elsewhere in this issue ?

My enchanting gratitude and thanks to all concern specially the members of the Editorial Board for their continued co-operation and active help for publication of this Journal.

Dated,  
The 25th March, 1996

**Prof. D. P. Pande**  
Editor-in-chief.





**RELIABILITY OF ACCOUNTING :  
CONTEXT, ISSUES AND APPROACHES**

*Dr. P. Chattopadhyay\**

Reliability of accounting should necessarily be examined from three discrete points of view. One, since a company deals with other people's money, whether all such dues have been properly accounted for; where repayments are to be made, whether all such liabilities have been correctly taken into view -covering principals and interest. Two, whether the funds deployed have been properly tracked down including profits and losses arising from the transactions that have taken place during the period in view. Three, whether all transactional details, accruals and pending liabilities as well as the assets and liabilities as on the date of closure of accounts have been put on a canvas so that all interested parties can have a glimpse of what happened with the funds put in, credit supplies made and profits earned and losses incurred. It is in the aforesaid con-

text that sanctity was sought to be given to the figures in the accounts as to whether the details represented a true and correct view of the state of affairs of a company for the concerned accounting period. Notable is the change introduced much later when fairness, and not correctness, as stressed. The concept of audit acquired its sound rationale insofar as it related to ensuring that the figures presented in the accounts were of avouched veracity. The relevance or any other matters of business risks or prudent or reckless deals were not areas of central focus for audit. It will be recalled that Adam Smith accused that corporate managers dealing with other people's money and having little stake of their own were bound to be reckless. This part of the story has remained rather murky even now as there is no means to keep the corporate managers under rein before a deal like this is struck. Law and all others concerned become wiser only after the event. Though the concept of concurrent audit evolved later to

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\* Former Director of Research  
I. C. W. A. I. Retd. Professor,  
Deptt. of Business Admini-  
stration, B. U.

deal with this phenomenon, it has never been a legal requirement. But it must be appreciated that the idea of audit was to ensure and enhance reliability of the figures presented in the accounts, both from the standpoints of investors and the law.

Reliability of accounting has, therefore, a connotation somewhat wider than what the literal meaning of the word suggests. The dictionary meaning of the word is 'able to be trusted, predictable or dependable'. In the typical context of accounting the term underlines that the users of accounting information should be able to rely on some basic assumptions regarding the quality of information available in the accounts. The ultimate criterion of reliability of accounting information is one which somehow satisfies the following conditions a la Glautier et al :

a) that users know precisely the meaning of information, and are not deceived in their analysis of its relevance to their own needs

b) that users know precisely the limits to the knowledge content of the information so provided.

"It is evident that in considering the range of public expectations from accounting information, a degree of reliability which satisfies the minimum conditions stated above must be regarded as a funda-

mental requirement." Uniformity, comparability and judgement are the other virtues that are complementary to the basic virtue of reliability without which accounting information becomes unfruitful exercise failing to convey what it should. Here, mention is necessary that judgement as a virtue stresses that some variety may be accommodated in the procedures available for transforming data into information. Data processed for particular purposes may be information; the same data may be processed for different purposes in different ways to become information to the users. One function of accounting is supposed to be providing information; in such assertion two points are missed. Figures provided in the annual report are information per se as they satisfy different requirements such as compliance with the dictates of the law, highlighting the progress made in different directions and investors of various classes, energy conservation, foreign exchange earned and expended.

The concept of reliability is also integrally connected with those of uniformity and comparability. Thus to make accounts comparable, uniform practices and procedures should be ensured not only over time but also as respects other units.

If there are frequent changes in the procedures adopted, credibility problems arise. Injection of the term 'true and fair' in place of the old 'true and correct' has given an elbow room to accountants all right; it has also created a chasm in the understanding and acceptance among the user public of such information. Independence of audit and some permanence in the tenure of auditors suggest themselves in this context, at present seriously marred by the subservience of auditors and submission to management wishes for the fear of losing clientele. Relevance of establishing accounting standards derives its logic and sustenance from several sources at the same time. However, despite all these attempts, sleight-of-hand continues in the name of what is called 'creative' accounting.

A major objection to the audit conducted by the CAG relates to the fact that the CAG delves into the heart of the matter, often recompiling the accounts from the original vouchers and questioning the nature and character of the business deals. Thus, when STC showed an augmented revenue arising from deals in which it acted only as an agent of the Government and was entitled only to the commission at a stipulated rate, it was the CAG

that pointed this out and caused a recasting of the company's profit and loss account. Instead of appreciation, CAG was able only to draw a scare from the company and the Government. Dressing up, manipulation and inclusion of past period sale into the figures of the current period have all created awe as to what the company accounts are after all supposed to convey, if the contents are on the whole of questionable veracity. This apart, reports of various ways of manipulation of accounts adopted by different companies in both sectors of the economy have been reported during the last several years creating widespread confusion as to what the accounts are supposed to inform and whether they legitimately discharge the responsibility thrust on them and whether the accounts are true indices of accountability in the last analysis. These attempts have been so widespread throughout the world and have been raised to a level of such sophistication as would call for some comment especially because while the compilers of accounting data and accounting information are qualified professionals, the user community generally is not so well conversant with the trickery that accounts are in a position to play.

The regulatory measures adopted by the Government in terms of an omnipotent, omnibus Companies Act and the existence of Company Law Board and the Monopolies Commission, companies have somehow found their way to put flies in the ointment. These flies come in the form of these-called variety in practices and procedures allowed by the law as also the Accounting Standards and the compulsory inclusion of accounting policies followed in the preparation of accounts in the cases of companies as per the Accounting Standards issued by the Institute of Chartered Accountants of India. Such variegations often create the dilemma as to whether the information so provided could be used for different purposes. The present investors to the share capital of a company, subscribers to bonds and depositors as also banks and financial institutions require relevant information as to whether they would sell out their holdings or take steps to realize dues, as the case may be. The shareholders are not only interested in current returns but would also like to know the prospects in future. The company itself is interested in such information so that in all future share floatations, it could charge a premium depending on the state of the market and

the enthusiasm of investors. Though the secondary market movements are not much of immediate concern to the companies, determination of share prices in the primary market is, in fact, on the basis of how the company is doing and this is where dressing up arises.

A recent example of the share issue by IPCL at a premium of Rs. 160 per share has created problems as it was reported that the company incurred cash losses continuously for quite some time, a fact which was not reported in the prospectus. The shares have been over-subscribed almost by playing a trick by the company. Similar instances are there in the cases of several other companies as well. In all these controversies, one point is missed altogether. It is that the interest of a company is not necessarily identical with that of shareholders and the design and presentation of corporate accounts have to be such that would not only satisfy the reliability tests as mentioned earlier but also several other tests that management must apply to assess how the company fared in the past, is doing at present and is likely to fare in the future with reference to its technology, its products, its markets and, above all, the managers who are at the helm. In

this respect, even short term performance may be somewhat different from long term trends and it should be the long term trends that would require closer watch because in the short run many ripples in the operating circles embracing manufacturing and marketing may disturb and distort the short term picture. Presentation of information in the accounts should take into view all these issues.

Reliability of accounting can be logically considered from the following standpoints.

a) Disclosure of information addressed to the society at large rather than only to shareholders; for, shareholders are no owners of corporate property as long as a company is a going concern. The company's own interest is in its perpetuity and derivation of sustenance from its operation. How far these requirements are met from the year's operations are the points for watch in the annual accounts which are, in fact, a culmination of the transactional multitudes in its chosen line of activities.

b) Disclosure of information aimed at informing the investors—shareholders, debentureholders, depositors and creditors—so that they remain informed as to whether their funds are secured, on

the one hand, and return on their funds is forthcoming, on the other, on the basis of the operations during the accounting period. Since shareholders are interested in return of capital and on capital, it is essential that information of sufficient to tell the shareholders that their points of interest are not in jeopardy.

c) Information provided in the accounts must necessarily conform to the requirements set out in different sections of the Companies Act, on the one hand, and guidelines of SEBI, on the other. This would mean that the classification of receipts and expenditure, income and expenses and acquirement of assets and incurrence of liabilities should all be reported in the accounts.

d) The basis of valuation of assets should be very clearly laid down in the accounting policies, particularly closing stock and other near-cash items. The law at present does not require disclosure of age groups of sundry debtors in the absence of which it is not possible to determine as to whether the figures shown in the sundry debtors column are immediately realizable or otherwise and whether costs are involved in such realization. In this respect, it is also necessary to distinguish travels and trips

for realization of funds which at present come under the broad head travelling expenses but should more logically come by way of deduction from the realizable sundry debtors items, particularly because the cost of collection is a deductible item from sundry debtors.

e) The accrual basis of accounting that the companies employ result in computing profit on the basis of incomes accrued but not realized and liabilities incurred but not paid for. This also creates problems of credibility in view of the fact that the profit shown in the profit and loss account of a company and the balance sheet prepared in consonance therewith do not tell the truth that the profit so shown is not supported by cash availability and it may be difficult for a company even to pay out dividend unless the debts are realized. Reliability of the profit figure thus comes under doubt.

f) Assets acquired over a period of time and at different values, not necessarily technologically superior items, create difficulties in the context of both reliability and comparability. With money value sliding down, both reliability and comparability are at stake because a company with an older asset but at lower values is likely to show better

performance in terms of return on capital employed than a company much younger and with capital items acquired at much higher values even with same or similar productive capacity. This resulted in the large scale debate on inflation accounting practices and procedures. Mostly due to governmental indifference, inflation accounting has never had the chance of a formal recognition as an integral part of annual accounts of a company. As Tata Iron and Steel Company showed in the speech of J. R. D. Tata, there occurred material differences in the values shown in the accounts and the values in real life.

In considering reliability, these factors have a prime of place and the methodology of computation of accounts has something to do with the ultimate picture of performance that emerges from the accounts. The valuation methods adopted for different types of assets and the traditional dictum of cost or market value whichever is lower make existing confusion worse confounded. In the cases of both fixed assets and circulating assets, scope for manipulation exists. Unless consistency in valuation is deliberately aimed and achieved, the credibility questions cannot be resolved. On the other hand, even conventional finan-

cial analysis suffers from different major limitations arising from problems inherent in accounting practice. Limitation stems, a la Glautier, from conventions associated with the measurement of periodic income and the representation of balance sheet values undermining the usefulness of accounting valuation of the enterprise. Limitation also stems from the restrictions on the disclosure of information to shareholders and investors. As a result of the restrictions on information disclosures allowed by the Companies Act, financial statements are not generally regarded as providing information of immediate relevance to investors. Financial statements generally have a temporary impact when they are published but have formed a very small part of the total information flow used, for example, on the stock exchange.

Interpretation of financial results by ratio analysis also suffers from umpteen difficulties. Depending on the accounting practices followed, the ratios comprising various numerators and denominators, fail to convey information in a tell-tale manner when both numerators and denominators suffer from computational variegations. Moreover, there are some four hundred thirty ratios that Tucker computed which he thought

useful for successful management. These implied that a lot of time and effort would go for ratio computation alone, but the bases on which such ratios are computed lacked credibility unless particular regard was paid to consistency and innate logic. As one of the synonyms of reliability, predictability of operations and results was also seriously impaired by the conventional methods of preparation of accounts, disclosure of information and the financial analysis attempted on these bases. On the side of predictability, it may be mentioned that accounting information is essentially based on hindsight. The more organised such information is the less appears its relevance for purposes of decision making. Cost accounting relates to the past, managers find it difficult to utilize accounting information for projecting into the future, particularly where the trend is dysfunctional.

In this respect, one remembers that both W. H. Beaver and E. I. Altman of the United States tried with about fifty-six ratios and they found only five relevant for predictive purposes. At least for predictive purposes the rest of the ratios appeared junk. Studies on similar lines by L. C. Gupta and V. S. Kaveri also subscribed to this view. On the other hand, only fourteen

ratios computed by Donald Miller sought to gauge the performance on the basis of six ratios that traced causes and eight ratios that measured effects. Between Tucker and Donald two ends of a spectrum are provided in between which there are several other numbers of ratios seeking to highlight different aspects - all based on the accounting practices followed by the enterprises. Dependability or otherwise of the findings from such ratios is hardly certain because particularly of the fact that often a set of ratios opened up at different directions and a composite of these ratios may also not speak the truth. In the circumstances, the methodology of accounts preparation, disclosure of information and the types of analysis possible with the accounting data call for much closure attention of professionals. The approach as at present has been generally mechanical. This is particularly because the users of accounting information have hardly any professional knowledge as to how the data are computed and processed and as to what limitations they suffer from.

A reference has been made to creative accounting in a foregoing paragraph. It is so called because it is not against the law but it is enough to create a dense cloud in the atmos-

phere from which the uninitiated is hardly likely to have a clear vision. Though it is not against the law, it does operate both within the letter of law and of accounting standards but is patently against the spirit of both. It is a process of using the rules, the flexibility provided by them and the omissions within them, to make financial statements look somewhat different from what was intended by the rule. It consists of rule bending and loophole seeking, a la Michael Jameson. Creative accounting includes also the process by which transactions are structured so as to produce the required accounting outcome rather than allowing accounting to report transactions in a neutral and consistent way. It is important that accounting does not become too hide-bound by restrictive rules and detailed prescription since such approaches generate even more effort to best the system. Whether an account has been fudged or otherwise can hardly be detected easily—at least not by the untrained eye. Such fudging is directed towards projecting silver linings which are essentially illusions. If in one case it comes to light, it furnishes the image that accounting is supposed to project. In this professionals and non-professionals have been equally guilty.



For instance, in most of the public sector enterprises, with government directive the profit should be earned, large scale efforts have gone into presenting a picture in the annual accounts which would be materially different from both truth and fairness. In different organizations, some of them can be immediately named in order to boost the annual profit different practices had been adopted which enter surpassed the losses or boosted the revenues or overvalued stock. Revaluation of assets has been attempted in many a case either to avoid taxes or to attract investors when new issues were in the offing. In the private sector as well companies have not generally been free from presenting a rosy picture when the reality was just the contrary.

In such conditions as hinted at, accounting has long ceased to be a respectable document, every figure in which is of unquestioned veracity. Gone are the days when the honest presentation was put at a premium. In an atmosphere of competition cosmetic changes and adoption of expressions have virtually resulted in calling coal gold exclusively on the basis of their phonetic similarity. At one time, accounting figures figured as chaste and unpolluted by any extraneous consideration. They

enjoyed a status of conclusive evidence. Even now, annual reports are considered as primary sources, albeit printed. From this status of Ceaser's wife, accounting has fallen downhill in people's perception. Time, serious thinking went into re-vamping and reinstalling accounting figures and accounts in proper place. It is, however, no time for requiem.

Our discussion would not be complete without a few comments about how to reestablish the credibility of accounting and reaffirm the reliability of accounting figures. For this purpose a few measures are suggested which may be taken into view in the context of amendment of the Company Law and computerization of information. First of all, it is essential to underline that accounting information is the culmination of the operations of a company during the accounting period. Accounting data are compiled and computed leading to the finding of profit or loss from the operations. Secondly, at least for one month after the balance sheet date, no virtual change should be effected as between assets and liabilities of a company. Thirdly, it is relevant that the manner of computing information under different heads should be explained. At present, the indi-

vidual points included in the accounting policies are anything but clear. Even to professionals it becomes difficult to understand the realities of practice-to non professionals they are nothing but nebulous. Accounting information failing to convey what it should does not deserve the name given to it. Lastly, it must necessarily be understood the annual accounts are not addressed to shareholders but to the community as a whole and the entire orientation of the figures

presented should be from that point of view. Dressing up directly or indirectly or any attempt at creative accounting should be considered unprofessional and should be referred to the disciplinary committee of the respective accounting bodies. All this, however, does not mean that wrong conclusions reached from the figures by users should be ascribed to the accountants or misunderstandings on the part of the users should be blamed on the accounts themselves.

SOME TESTS OF CAPM WITH INDIAN SHARE PRICE DATA

*Prof. Amit Mallik\**

*Dr. Santanu Kumar Ghosh\*\**

The task of measuring the value of an asset or a firm's stock is most interesting and challenging as the process of valuation is vexingly difficult. The value of a particular asset or stock of a firm is assumed to be the fair price that an investor would be willing to pay. The determination of this fair price depends on different factors like—the expected return arising out of the proposed asset, the burden that is to be borne by the investor to earn such an amount of expected return (i.e., risk) and the period during which the investor has to wait for this return or yield. Thus, the task of such a valuation involves forecasts for all of these determinants but probably the most difficult part of the job is to measure the risk of a particular asset as well as its incorporation into a valuation model.

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\* Professor, Department of Commerce & Dean, Faculty of Arts, Commerce, Fine Arts, Law & Music, Burdwan University.

\*\* Lecturer, Khalisani Mahavidyalaya.

The research on Investment Management and on the behaviour of the capital market gained tremendous momentum with the development of the Portfolio Selection Model by Harry Markowitz (1) Following his work, W.F. Sharpe (2) developed the single period Capital Asset Pricing Model (CAPM) which provides an equilibrium solution to the capital market. Several other models have also been developed by many authors like—John Lintner (3) E. Fama (4) and Mossin (5). of them, Sharpe's model is, perhaps the most accepted one.

Both the Modern Portfolio Theory and the CAPM argue that a portion of the total risk of an individual asset can be eliminated by its inclusion in a portfolio in a judicious manner. The remaining part of the risk i.e., the variability of its return is related to the general market changes which, in the Sharpe's model, has been measured by the slope of the security market line, denoted as beta ( $\beta$ ) coefficient.

According to the basic single-period asset pricing model, the expected return on security 'i' can be written as :

$$E(\hat{R}_i) = R_f + \beta_i [E(\hat{R}_M) - R_f] \quad (1)$$

Where  $R_f$  = the risk-free rate of return

$$\beta_i = \frac{\text{Cov. } \hat{R}_i \hat{R}_m}{\text{Var } \hat{R}_m}$$

$\hat{R}_m$  = market rate of return and the tilde denotes the random variable.

Most of the empirical tests relating to the empirical validity of the model have been designed either to consider its forecasting ability or to examine if the model could be able to provide more accurate predictions regarding the parameters used in this model by using some other added factors with the original form.

The forecasting ability has been tested by many authors (6, 7, 8, 9, 10, 11)

Both the Modern Portfolio Theory and the CAPM assume that the distributions of returns of the individual securities are stable with a finite variance (i. e., normal distribution). This has been tested by Cooley, Roenfeldt and Modani (12), Levy (13), Arditi (14), Kraus and

Litzenberger (15).

The empirical works involve ex-ante prediction by using ex-post data. This, in turn, requires that the risk-parameter beta be stationary overtime. Several studies have found that the stock beta does not remain stable over contiguous sample period (16, 17, 18, 19). There are some other studies also which have justified the assumption of beta stability (20, 21).

In a large part of the above mentioned studies, the researchers have found that the model is not sufficient to describe the past performance or the future expectation very well and the risk description according to this model, by beta, is also insufficient.

The empirical evidence on the Indian context is too limited to be mentioned here. Of them Gupta (22) and Choudhuri (23) are worth mentioning.

The objective of this study is to examine the empirical validity of the basic CAPM. Instead of considering all facets of the model, this study seeks to address only three issues, namely, (i) the assumption of normality, (ii) the assumption of risk-return linear relationship and (iii) the stability of the risk-parameter-beta. While Section-II, provides the data and the methodology

of the tests, the results are presented in section III followed by the Conclusion in section IV.

## Section—II

### Data & Methodology

#### Data :

The present study includes altogether, 110 actively traded equity shares in four major stock exchanges namely—Bombay, Calcutta, Delhi and Madras, during the period—January 1974 to December 1988.

The data which have been used in the present study are: the week-end share price quotations with one month lag collected from the daily, Economic Times, (ii) the monthly equity price indices (regional) and (iii) the monthly yield rates for the gilt-edged government securities as a proxy for the risk-free rate both of them collected from the Reserve Bank of India Bulletins.

#### Methodology :

Before conducting empirical tests of the above mentioned assumptions of CAPM, the systematic risk, beta, for the individual shares has been estimated using the time series least-square regression of the following form :

$$r_{it} = \alpha_i + \beta_i r_{mt} + u_{it} \quad \dots\dots 1 \text{ (a)}$$

Where,  $r_{it} = R_{it} - R_{ft}$ , the ex post excess return on each security at period  $t$ .

$r_{mt} = R_{mt} - R_{ft}$ , the ex post excess return on the market portfolio at 't',

$\alpha_i$  and  $\beta_i$  are, respectively the intercept and slope of the regression equation.

$u_{it}$  represents the random error term and 't' stands for the observational interval and 'i' is used to denote the firm.

In order to calculate the monthly return on each security ( $R_{it}$ ) the study employs the Napierian Logarithm of monthly price relatives. The monthly equity price indices have been converted into the return on the market portfolio ( $R_{mt}$ ) by taking the natural log of the reciprocal of the price indices. The yield rates of the gilt-edged government securities have been converted into the 'continuously compounded' form by means of taking the average of the Napierian Logarithmic value of the reciprocal of the months-end-redemption value including interest, and the rate so arrived at, has been used as the proxy for the risk-free-rate ( $R_{ft}$ ).

The present study uses five sub-periods of three years each. The first sub-period starts from January 1974 and ends with December 1976, while the last sub-period, includes

three years from January 1986 to December 1988.

### Test Procedures :

A. For Normality—In order to test the validity of the assumption concerning the distribution of the security's return, some useful statistics such as mean-deviation, standard-deviation, skewness and kurtosis have been computed for the distribution of the individual shares' return. According to Kendall and Stuart, the mean-deviation of a normal distribution is equal to .7979 of its standard deviation.

The present study employs the following tests of Skewness and Kurtosis.

$$(i) H_0 : b_1 = 0, \text{ where } b_1 = \frac{m_3}{m_2^{3/2}}$$

while  $m_3$  and  $m_2$  represent the third and the second moments respectively.

$$(ii) H_0 : b_2 = 3, \text{ where } b_2 = \frac{m_4}{m_2^2}$$

and  $m_4$  denotes the fourth moment.

The assumption of the normally distributed return stands valid if the observed values of the above two coefficients are not significantly different from their respective theoretical values,—while 'z' values have been computed in order to

test their statistical significance.

B. For Risk-Return Relationship—Several earlier studies have used the cross-sectional regression analysis for examining the risk-return relationship given by the CAPM. In the present study, the empirical validity of the assumption of 'linear risk-return relationship' has been examined using the cross-sectional regression of the following form :

$$\bar{r} = Y_0 + Y_1 \hat{\beta} + e \dots (2)$$

Where  $\bar{r}$  represents the average excess return of a security;  $\hat{\beta}$  stands for the estimated risk coefficient for the individual shares;  $Y_0$  and  $Y_1$  are the intercept and the slope respectively, while 'e' represents the error term.

In addition to the above, it has also been tested if there is any added return for bearing the non-systematic or non-market risk with the help of the following cross-sectional regression :

$$\bar{r} = Y_0 + Y_1 \hat{\beta} + Y_2 \hat{SE}^2 + e \dots (2a),$$

where  $Y_2$  represents the slope and  $\hat{SE}^2$  stands for the residual variance. Other variables are similar to those of equation (2).

According to the basic CAPM, the average excess return ' $\bar{r}$ ' is a linear function of the systematic

risk - beta. Hence, if the model is valid, the value of  $Y_0$  and  $Y_2$  will be equal to zero and that of  $Y_1$  will be equal to the excess return on the market portfolio ( $R_m - R_f$ ). The students' 't' test has been applied to examine the statistical significance of the values of all the parameters of the above two tests.

C. For Beta Stability—In order to examine beta stability, the present study applies the 'transition-matrix' technique. For this purpose, the individual shares have been grouped into three different risk-classes depending on their beta values in different sub-periods. The first group includes high beta securities i.e., the securities with beta values more than one. For the second or the intermediate group, only those securities have been considered for which the beta values vary from .5 to 1. And the third group consists of only those securities whose beta values are less than .5. It is needless to mention that the grouping procedure adopted in this study is not sufficient to capture minor changes in the beta values. But such a technique should not be called inefficient especially in the context of the general convention of identifying stocks as 'defensive' or 'aggressive'. It is also expected that the

present method will not be more inadequate than the method in which beta values are grouped into quartiles. However, the 'transition matrix' so formed, have been tested against the null hypothesis that the distribution occurred by random chance with the help of the chi-square statistics.

In addition to the above, the Mean-Absolute-Deviation of changes in the beta values have also been computed in order to see which of the above mentioned risk classes is more stable.

### Section—III

#### Results

From the estimates of the risk-parameter beta for all the individual shares selected for this study over a period of fifteen years, it is evident that the sample consists of securities representing a wide range of risk classes. More specifically, the sample includes securities the beta values of which range from .38 to 2.72. [For want of space, the beta values are not reported here].

#### Normality :

From the results of two types of tests applied in this study for examining the nature of the distribution of returns of the equity shares

(reported in Table-1), it is apparent that in a large part of the total sample, the returns are not normally distributed. In most of the cases of the first test the ratio between Mean-Deviation and Standard-Deviation of returns is clearly different from the theoretical value of .7979. For the shares quoted in the Bombay Stock Exchange during the study period of fifteen years, values of such ratio are closer to its theoretical standard in a maximum of 40% cases during 1986-88. While in case of Calcutta Stock Exchange the result is seen to be less encouraging (maximum of 38% cases in two sub-periods). But in the absence of any test of significance it is not clear whether such differences from the theoretical value are statistically significant or not.

The skewness-based test of normality gives the impression that the return distributions are more or less normal. The percentage of firms obeying this test (that  $b_1=0$ ) varies from 43 to 77 in case of BSE and the corresponding figures for CSE are 67 to 86. The Kurtosis-based test of normality gives discouraging result for BSE, the highest percentage of firms having  $b_2=3$  being only 3 in the first sub-period. For CSE, the result is somewhat better the percentage varying bet-

ween 38 and 48.

Amongst non-normal firms (as per Kurtosis-based test), the overwhelming majority have Leptokurtic values the percentage varying between 80 and 90 for BSE and 81 and 90 for CSE.

#### Risk-Return Relationship :

In order to examine whether the risk and return, as required by the basic CAPM, are linearly related or not, the cross-sectional regression for all the securities (included in the present sample) quoted in the Bombay and Calcutta Stock-Exchanges are run. It has also been examined if the residual variance can significantly affect the security's return. The results of both the tests (exchange-wise) have been reported in Tables—2 (a) and 2 (b).

The present study observes mixed results. Though, in all the cases  $Y_0$  values are not significantly different from zero the  $Y_1$  appears to have significantly different values from its theoretical standard in three out of ten regression estimates in case of shares listed in the BSE [Table 2 (a)] and in one out of ten regression estimates for shares listed in the CSE. The  $Y_2$  values, however, are not significantly different from its theoretical value except for the third sub-period (1980-82) in case of



the shares listed in CSE only [Table 2 (b)].

For the Shares listed in the BSE, the study observes significantly different  $Y_1$  values during the first [equation 2] and the third sub-periods [equation 2 (a)]. While for those listed in the CSE, such an unexpected value occurs during the sub-period 1980-82. In this case, the study observes an interesting feature that the value of  $Y_1$  for the third sub-period becomes significantly different from its theoretical value only when the expanded form [equation 2 (a)] of the cross-sectional regression is used to measure the effect of residual variance. During this period only, the effect of residual variance or the unsystematic risk upon the returns of the securities listed in the CSE is found statistically significant. Apart from this single instance, the empirical evidences are strong enough to validate the basic CAPM with regard to its claim that the systematic risk of an asset is the only relevant factor affecting its earnings. However, the evidence of 1980-82 should not be ignored casually. Because if such an observed relationship is not attributable to the very small size of the sample used in the present study, the basic CAPM would be considered 'misspecified'. Only a

more rigorous test in this context, may help reach a valid conclusion.

With regard to the assumption of linearity, the test results in general, speak for its appropriateness. But, during the first sub-period (1974-76) and the third sub-period (1980-82), the relationship appears to be non-linear for the securities quoted in in the BSE. Though the results of the CSE are very encouraging, these observations can not be ignored as mere exceptions. This issue, therefore, requires further research with large sample of equity share data.

#### Beta Stability :

This is one of the most important assumptions implicit in the basic single-period asset pricing model. Because, the use of ex-post data for ex-ante prediction necessarily requires that the risk characteristic of the firm remains the same during the future periods. If, on the other hand, it changes over time, the predictive ability of the market model will be seriously affected and as a result, the model can not be accepted as empirically valid.

In view of the results presented in Table-3, the group-A stocks which are listed in the Bombay Stock Exchange are most stable. The results of the Chi-square test reveal that the observed risk characteristics which remain unchanged

over the periods in question are significant at 5% level in all cases except those from period I to period II and also those from period I to period V. Thus, in so far as the securities listed in the BSE are concerned, the beta values in the large part of the total estimation period remain stable. Expectedly, however, the risk characteristics of the firms for the last sub-period (1986-88) are clearly different from those of the first sub-period (1974-76).

In case of the securities listed in the Calcutta Stock Exchange, the study has evidenced situations which are in clear disagreement with the aforesaid observations in case of BSE. More specifically, the beta values are found significantly unstable in all the sub-periods except from the first (1974-76) to the second (1977-79) sub-period. But another important feature of this part of the study is that risk characteristics of the securities quoted in the CSE during the last sub-period (1986-88) are similar to those of the initial sub-period i. e., 1974-76. Hence, it can be argued that the stability of beta is conditional upon the measurement period used to estimate the corporate risk characteristics. The present study, however, observes mixed results relating

to the empirical validity of the assumption of beta stability.

Such a mixed result makes it difficult to arrive at any direct conclusion. Much more care should be taken to interpret them failing which the outcome may be biased and faulty. Because the question of an appropriate estimation period remains unresolved. This might have influenced the results of the present empirical study also. Secondly, the investigation has been performed on the basis of only 21 shares drawn from the CSE, a number that represents only a small fraction of the actual population. Comparatively large number of securities have been selected from the BSE for which the test results are also highly encouraging. Hence, an investigation on the basis of a large number of securities and varying estimation periods may provide a decisive result on this issue.

Lastly, the Mean-Absolute-Deviations for each of the three risk classes have been computed (exchange-wise) in order to examine their comparative stability. These results also provide no direct conclusion. As per the MAD values presented in Table 3 (a), it is evident that for the firms listed in the BSE, the aggressive stocks' (Group-A) risk characteristics are most stable when

compared with the other two subsequent risk classes. And the beta values of the firms belonging to the intermediate risk class are most unstable. On the other hand, in case of the firms listed in the CSE, the intermediate risk group is most stable and the highly defensive stocks (Group-C) are most unstable. But the important thing to note is that the MAD values for the firms belonging to the two extreme risk classes (A and C) listed in the BSE are almost equal to their (risk classes) respective values (MAD) observed for the firms listed in the CSE. This leads to the conclusion that the two extreme risk classes are more stable than the intermediate risk class (Group-B).

Hence, in view of the empirical results presented above, the present study restrains itself from making the final verdict on the reliability of the assumption of beta stationarity. In case of beta instability, the Bayesian adjustment technique suggested by Vasichek (24) can be used in order to ensure better forecast.

#### Section—IV

#### Conclusions

The present investigation relating to the estimation of the security's risk parameter—beta and some

modest tests on the validity of the basis single period asset pricing model fails to arrive at any direct conclusion. The test of a theory involves the examination of the extent to which the basic assumptions that underlie the theory can appropriately reflect the real world situation.

Following conclusions emerge from the tests of the three basic assumptions of the single CAPM :

(i) The distributions of returns of the individual securities included in the present sample are found to be symmetric in some cases and asymmetric in others. Though, no direct conclusion can be drawn in this regard, the assumption of 'normally distributed returns' can not be rejected outright. Rather, a sizeable portion of the total sample which show normally distributed returns clearly speak for the appropriateness of the assumption relating to the distribution of returns. As it is an expectational model, the present study, considering the asymmetric returns of some of the firms included in the present sample, makes no concluding remarks on the validity of this assumption and suggests that further research using larger sample may be helpful in this regard.

(ii) Whether or not, the model reflects the risk-return relationship

accurately, has been tested and unfortunately, the empirical results of this test also remain inconclusive. Though, the test results, in most of the cases, are in conformity with the assumption of linearity, the present study does not suggest to ignore the anomalies observed between the theory and the real world situation using the beta relating to the Indian Capital Market. Instead, more intensive study is suggested on this issue also.

(iii) With regard to the stability of risk parameter-beta, the study neither supports the conclusion made by Baesel (25), nor endorses the views of Alexander and Charveny's (26) study.

Mixed results of the present investigation suggest the need for using Bayesian adjustment technique for more reliable beta prediction.

On the whole, as the study has been performed on the basis of very small sets of equity share data, it may not be wise to make conclusive remarks on the validity of the CAPM.

In this context, however, the remarks of Roll (27) can be remembered. He questioned the testability of the CAPM. According to him, it is an expectational model and it requires the use of full set of data on the assets available to the inves-

tors during a particular period as an index which can not be completely known. Thus, the proxy for market index can not be tested whether it is similar to the unknown market portfolio or not and hence, he remarked that no satisfactory conclusion can be drawn from any test on the validity of the CAPM. The empirical findings of the present study reflect this views of Roll. Lastly, the present study suggests further investigation in relation to the appropriate 'market index' in the Indian context that can be confidently and reliably used for this purpose.

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Table—1

Percentage of firms obeying tests of normality in different sub-periods and nature of Kurtosis in non-normal firms

Sub-Periods	BOMBAY			CALCUTTA			Distribution of non-normal firms			
							BOMBAY		CALCUTTA	
	$\frac{M.D.}{S.D.} = .7979$	$b_1 = 0$	$b_2 = 3$	$\frac{M.D.}{S.D.} = .7979$	$b_1 = 0$	$b_2 = 3$	Lepto	Platy	Lepto	Platy
1974—76	37	43	33	29	81	38	87	13	86	14
1977—79	23	43	27	19	67	43	90	10	86	14
1980—82	20	53	20	38	81	48	90	10	81	19
1983—85	30	57	13	33	86	43	83	17	90	10
1986—88	40	77	30	38	71	43	80	20	81	19





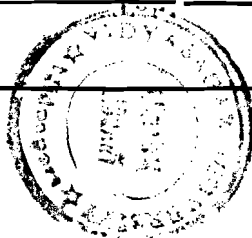
Table—2 (b)

Risk vs. Return : Cross-Sectional Regression ( Calcutta )

$r_i = Y_0 + Y_1 \hat{\beta}_i + \mu_i$					$r_i = Y_0 + Y_1 \hat{\beta}_i + Y_2 (\widehat{SE})^2 + \mu_i$					Theoretical Values.
Period	$Y_0$	$Y_1$	N	$R^2$	$Y_0$	$Y_1$	$Y_2$	N	$R^2$	
1974—76	-0.00794 (-0.29281)	-0.00047 (-0.0389)	15	.0001	-0.01060 (-0.37684)	0.000113 (1.009876)	0.340346 (0.291819)	15	.0072	$Y_0 = 0$ $Y_1 = -0.00875$ $Y_2 = 0$
1977—79	0.008238 (0.368924)	-0.00627 (-0.91015)	16	.0559	0.008383 (0.362892)	-0.00821 (-0.82827)	0.467160 (0.280845)	16	.0616	$Y_0 = 0$ $Y_1 = 0.004781$ $Y_2 = 0$
1980—82	0.010691 (0.308545)	-0.00163 (-0.18284)	12	.0033	-0.00517 (-0.19092)	0.023079 (2.010102)*	-2.65636 (-2.70976)**	12	.4511	$Y_0 = 0$ $Y_1 = 0.001170$ $Y_2 = 0$
1983—85	0.002854 (0.094496)	0.025862 (1.208987)	10	.1545	-0.00678 (-0.22566)	0.016390 (0.707600)	1.773807 (1.037954)	10	.2673	$Y_0 = 0$ $Y_1 = 0.15506$ $Y_2 = 0$
1986—88	0.007570 (0.197209)	-0.01398 (-1.30154)	16	.1079	0.010006 (0.257912)	-0.00956 (-0.79289)	-0.60609 (-0.83902)	16	.1538	$Y_0 = 0$ $Y_1 = -0.00221$ $Y_2 = 0$

★ Significant at 5% level,

★★ Significant at 1% level



Table—3

Proportion In Same Risk Class

Risk Class	PERIOD									
	Period I to Period II 1974—76 to 1977—79		Period II to Period III 1977—79 to 1980—82		Period III to Period IV 1980—82 to 1983—85		Period IV to Period V 1983—85 to 1986—88		Period I to Period V 1974—76 to 1986—88	
	Bombay	Cal.	Bombay	Cal.	Bombay	Cal.	Bombay	Cal.	Bombay	Cal.
A	.5556	.6364	.5357	.5000	.4828	.0000	.6250	.0000	.5000	.6364
B	.4000	.5714	.3478	.1250	.4848	.3333	.5750	.3334	.4333	.7143
C	.2727	.3334	.2500	.3333	.1875	.5714	.2500	.1333	.0900	1.000
X <sup>2</sup> Values D. F. =2	8.0071	1.1111	3.7399	11.2500	5.2288	18.5000	1.3063	8.03	9.0878	2.0000

Table—3 (a)Comparative Stability Test of Three Risk Classes, MAD Values

Stock Exchanges—	Bombay			Calcutta		
Risk Classes—	A	B	C	A	B	C
MAD	2.64	3.28	3.04	2.72	1.6	3.04

**TAX INCENTIVES FOR ECONOMIC DEVELOPMENT OF  
RURAL \*<sup>1</sup> AND BACKWARD \*<sup>2</sup> REGIONS OF INDIA**

*Dr. D. P. Pande*

INTRODUCTION :

The history of income tax in India dates back to 1860 when first Income-tax Act came in force through the legislation. Between 1868 and 1886 a number of experiments were made with the drama of 'imposition-withdrawal' continued. The Income-tax Act, 1886 settled the broad pattern of taxation in India accepting income tax as one of the basic elements in Indian fiscal system. It remained without any major alteration for a long period of 30 years. During this long period certain anomalies were detected and were gradually rectified, specially by the Income-tax Act, 1916. The period from 1886 to 1916, may be termed as a period of integration, which led to a firm structure of Indian income tax. The Act was further replaced gradually in 1918, 1920, 1922, 1930,

Professor, Department of  
Commerce With Farm Manage-  
ment, Vidyasagar University,  
Midnapore.

1939, 1940, 1946, 1961 over and above replacement and addition of different provisions befitting the economic needs of the country. The process is ever-continuing either through administrative circulars or by annual amendments by parliamentarians through Finance Acts.

OBJECTIVES OF TAXATION

POLICY :

In the economic sense, the objectives of any taxation policy may be summarised as Growth; Equity; and Stabilisation of the economy. To achieve such planned objectives we can say that major objectives behind any tax policy are three-fold : (i) to collect increasing amount of revenue; (ii) to promote equity in distribution of income and wealth; and (iii) to achieve higher economic growth by maintaining higher rate of savings and investment as such in the desired channels. The other accompanying objectives may be

mentioned as generation of employment, regional development, curbing of inflation, utilisation of factors-capacity etc. The subsidiary objectives are ever changing and remodelled to meet specific purposes at a particular point of time. Though the objectives are very much interrelated but sometimes they are conflicting to each other. As for example, rebates and reliefs in taxation may be allowed to develop a particular backward region but that may lead to the diminution in the amount of revenue to the exchequer.

In the face of so many interrelated and apparently conflicting objectives, what I mean to say, it is very difficult to come to a conclusive decision as to the effectiveness of taxation to achieve a particular objective. A number of Committees, Commissions had been appointed by the Government to study the structure and rationale of different types of tax measures since 1860 but none of the Committees are able to prescribe an ideal profile which can fulfill all the objectives taken together. The Government generally tries to make balance of all the planned objectives and formulate its fiscal policies accordingly to render the optimum amount of socio-economic benefits to its subjects.

Therefore we can say that tax

measures in isolation can not do much for development of the economy but can act as 'catalytic agent' to pursue for fulfilment of any particular objective along with other measures for the purpose.

With this background we shall try to analyse and suggest reform of some of the provisions under the Income-tax Act, 1961 giving certain benefits to the assesseees having their investments in the economic development for rural and backward regions in our country.

#### BROAD OUTLINES OF THE STUDY :

The provisions as stated above for the purpose under the Act may be divided into two broad themes like (A) Specific provisions directly meant for development in the rural and backward areas of the Country; and (B) General provisions indirectly influencing such developments.

#### Provisions under the First category are :

1. To ensure balanced economic growth Sec. 80HH had been introduced where an assessee is entitled to a deduction of 20 percent of profits and gains derived from a new industrial undertaking ( other than a mining undertaking ) or the business of an approved hotel set up in a notified backward area as per

schedule Eight, which started functioning after Dec, 31, 1970 but before April 1, 1990, subject to conditions, inter-alia. The deduction is available for each of the 8 successive assessment years beginning with the assessment year in which the industrial undertaking begins to produce or manufacture articles or in which the business of the hotel starts functioning.

2. To prevent regional imbalance, deduction of 20 per cent of the profits from newly established small-scale industrial undertakings\*<sup>3</sup> subject to the conditions, inter-alia, that the same is established in a rural area and begins to produce or manufacture articles before 1st April 1990 but after Sept. 30, 1977. This deduction u/s 80 HHA is available for successive 8 years but not allowed if the benefit u/s. 80HH is availed of w.e.f. the A.Y. 1978-79.

3. Under section 80-I, a deduction is admissible to any new industrial undertaking including cold storage plants or a ship or a business of an approved hotel and begins to manufacture articles outside the non-priority items in the Eleventh Schedule, or starts functioning after March 31, 1981 but before April 1, 1991 @ 30 per cent for 10 assessment years for a corporate assessee, @ 25 per cent for a co-operative society

for 12 assessment years, and @ 25 per cent for any other non-corporate assessee for 10 assessment years, the rates and periods being for the financial year 1990—91, subject to the conditions, inter-alia.

4. Deduction from profits from industrial undertakings, cold storage or ship or the business of a hotel where the business starts functioning after March 31, 1991, at specified rate, period of deduction, subject to fulfilment of specified conditions comes under Section 80-IA.

A : Industrial undertaking set up in industrially<sup>4</sup> backward state; generation and distribution of power; industrial undertaking set up in backward district :

- |                   |      |               |
|-------------------|------|---------------|
| i) Company        | 100% | First 5 years |
|                   | 30%  | Next 5 years  |
| ii) Co-operatives | 100% | First 5 years |
|                   | 25%  | Next 7 years  |
| iii) Any other    | 100% | First 5 years |
|                   | 25%  | Next 5 years  |

B : Industrial undertaking other than A :

- |                   |     |          |
|-------------------|-----|----------|
| i) Company        | 30% | 10 years |
| ii) Co-operatives | 25% | 12 years |
| iii) Any other    | 25% | 10 years |

C : Hotel :

- |   |
|---|
| i) approved ups. 80-IA (5)                            |
| ii) located in hilly area or rural area or a place of |

- pilgrimage or in a notified area 50% 10 years  
 ii) any other hotel 30% 10 years  
 D. Ship : 30% 10 years  
 E. Enterprise starts operating and maintaining the infrastructure facility after April 1, 1995  
     100% First 5 years  
     30% Next 5 years.

So to keep it in mind as to applicability of the Secs.

—Unit starts functioning—

Section :	before	during	after
	April 1, 1990	1990-91	March 31, 1991
80HH	Available	Not Available	Not Available
80 HHA	-do-	-do-	-do-
80-I	-do-	Available	-do-
80-IA	Not available	Not available	Available

5. Deduction in respect of profits and gains from business of poultry farming under section 80-JJ @ 33 $\frac{1}{3}$  per cent came into effect from the assessment year 1990—91, subject to certain conditions.

Scope for Rationalisation

All these deductions are mostly welcome by us but the nature and way on which such incentives are allowed, are not beyond criticism and in our opinion, there is ample scope for rationalisation.

To remove regional imbalances there should be proper incentives, both fiscal and non-fiscal, to start,

or shift any venture in rural areas. But if we look at the industrial map of India, it may be seen that economic, specially industrial development is noticeable mainly near Metropolitan Cities. In 1968, the National Development Council constituted two Working Groups—one under the chairmanship of Mr. B. D. Pande, the then Secretary, Planning Commission and the other under Mr. K. N. Wanchoo, the then Secretary, Ministry of Industrial Development and Company Affairs. The former group, headed by Mr. Pande, was entrusted to evolve criteria of 'backwardness' and the later group, headed by Mr. Wanchoo, was entrusted to evolve nature of 'concessions' to attract industrialists to such backward regions. As formulated by the first Working Group, areas having 25 per cent below the national average, based on per capita income, per capita consumption of electricity, length of roads and railways, etc. were identified as 'backward'. Accordingly, Eighth Schedule has been prepared which shows the names of some of the districts as a whole in different states in India as backward areas. We can not deny the fact that all the districts are not of uniformly backward and even within the district all the areas are

also not equally backward but the tax benefits, based on the recommendations of Wanchoo-Group, under the above Sections are granted more or less equally irrespective of the degree of backwardness. This concept of 'backwardness' has resulted concentration of industries near the metropolis. So, to my mind, progressive quantum of incentives, based on degree of backwardness, should be introduced, if such provisions are at all necessary in the near future. Moreover it may also be suggested that all types of expenditure which are incurred exclusively for such rural industrialisation be allowed for tax purposes and deficiency or unabsorbed loss may also be allowed to carry forward for an indefinite period to be set off against the total income of the assessee arising under any heads of income.

My suggestions on the above line appears to be rational but that might lead to more complications in the system itself. So, for the sake of rationality as well as simplicity, we may think of withdrawing all such provisions from the tax law and be replaced by subsidies as a supporting measure for specific industries in specific locations.

Provisions under the second category are :

1. Under sections 35CCA, 100

per cent deduction is allowed for donations made to the associations/institutions carrying out rural development programmes subject to certain conditions given in clauses (1) (a); (1) (b) and (1) (c).

2. Sec. 35CC B has allowed 100 per cent deduction for donations made to associations/institutions for carrying out programmes of conservation of natural resources or afforestation being approved by the prescribed authority, i. e., the Secretary, Department of Environment, Govt. of India, subject to fulfilment of certain conditions.

3. With effect from the assessment year 1992-93 deduction of payment of any sum is allowed in computing profits of business or profession in respect of the expenditure incurred by a public sector company, a local authority or to an approved association or institution for carrying out any project or scheme for promoting social or economic welfare or upliftment of the public, as may be specified by the Central Government like construction and maintenance of drinking water projects in rural areas, construction of dwelling houses for the economically weaker sections of the society, construction of school buildings for children belonging to economically weaker sections etc. This new provision has



been inserted by the Finance (No. 2) Act, 1991 under Section 35AC.

The above three sections, viz., 35CCA, 35CCB or 35 AC are applicable if the taxpayer is carrying on a business or profession and if forming a part of business loss, may be carried forward for set off.

4. An assessee, not carrying on any business or profession, comes under section 80GGA where deduction is allowed, in respect of certain donations for scientific research or rural development paid to a scientific research association : university, college or other institution, a public sector company, local authority or an approved association; National Fund for rural development; National Poverty Eradication Fund (e. f. A.Y. 1996—97) etc. but the aggregate of deductions under Chapter VIA including this education cannot exceed the gross total income of the assessee for the concerned previous year. In otherwards, it can be noted that the loss arising out of availability of the benefits of deduction u/s. 80GGA is not allowed to be carried forward for future setting off

#### Scope for Rationalisation :

However laudable the objectives, the tax incentives will not sufficiently motivate private agencies to

take up philanthropic activities on their own. Further the provisions noted above discriminate taxpayers engaged in business with nonbusiness taxpayers and even associations or institutions approved by the appropriate authority with those which are not so approved but in the same line of 'socio-economic activity. The provisions, to my mind, create complications in tax management and in fact may lead to innumerable disputes and litigation. We may think of discontinuance of such provisions, indirectly influencing socio-economic development of rural and backward regions and may suggest amalgamation of all these provisions within the ambit of Section 80-G—Deduction in respect of duration to certain funds, charitable institutions, etc. and the deductible amount, 100 per cent or 50 per cent, of gross qualifying amount, may be judged and decided by the Government on its own merit based on national priority. The provision 80G may be amended to suit the needs of the society at large and rural economy in particular.'

#### Notes :

\* 1 Rural area means :

a) an area outside the limits of a municipality, cantonment board,

etc., and which has a population of less than 10,000; or

- b) an area which is not within such distance from the local limits of such municipality, etc., as the Central Govt. may notify from time to time.

\*2 Eighth Schedule contains the names of backward States and also backward areas, viz., districts. States and Union territories which are industrially backward are Arunachal Pradesh, Assam, Himachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Goa, Sikkim, Jammu and Kashmir; Andaman and Nicobar Islands, Dadra & Nagar Haveli, Daman & Diu, Lakshadweep and Pondicherry.

\*3 Aggregate value of the machinery and plant (other than tools, jigs, dies and moulds) of an industrial undertaking installed before August 1, 1980—not exceeding Rs. 10 lakhs; before March 18, 1985 Rs. 20 lakhs; on-

wards Rs. 35 lakhs; from the A. Y. 1993-94 . . .Rs. 60 lakhs; upto Rs. 75 lakhs if it exports at least 30% of the annual production by the end of 3rd year from the date of its commencement of production .

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**EMERGING TRENDS IN CORPORATE REPORTING**

*Dr. E. P. Ghosh*

**1. Introduction**

Corporate Reporting Standards and Practices developed at the national level are in the threshold of global integration and harmonization. With the current level of internationalization of the world's economies, the needs for harmonization of accounting and financial reporting policies are correspondingly increasing. More particularly, as part of Uruguay Round of the General Agreement on Tariffs and Trade (GATT), a draft Ministerial Decision was negotiated that call upon the members to "Work in cooperation with relevant inter-governmental and non-governmental organisations towards the establishment and adoption of common internal standards for the practice of relevant services, trades and professions". It is well accepted that harmonization of accounting and financial reporting standards facilitates significantly the expansion of foreign direct investments

and trades for economic development. Harmonization is also given priority in the business and financial world because of the significant growth of trade and investment within and across many national boundaries, growth of capital markets, expansion of banking system in developing countries, successful completion of GATT, Uruguay Round and reasonable arrangements to reduce trade barriers and the transition of some controlled economies to market economies.

In the second meeting of the Intergovernmental Group of Experts on International Standards of Accounting and Reporting (ISAR) (1), a body of UNCTAD, it has been agreed that a specific country might adopt accounting standards that do not coincide fully with international standards to cover specific situations in that country, but there must be some common grounds or core elements which should be embodied within the global standards or minimum standards. It is not reasonable that one country should require other

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Professor, Department of  
Commerce, University of  
Burdwan.

country to conform to its accounting standards; there should be reasonable degree of flexibility to facilitate a country to set its own standards suitable to its socio-economic, cultural, legal or political set-up. However, the idea of a set of global or minimum standards is believed to remove the inherent contradictions as regards the harmonization vis-a-vis conformation in the matter of corporate accounting and reporting.

Harmonization is possible with reference to a set of minimum standards comprising of some core elements whereas conformation requires adoption of a set of international accounting standards. At present, the degree of adoption of the various international accounting standards in different countries is also not very much encouraging.

With the background of this concept of global or minimum standards for corporate reporting to support internationalization of trade, industry and services, an attempt has been made in this article to detail out some emerging issues, which include—

- \* Environmental Reporting;
- \* 'Going Concern' Disclosures;
- \* Segmental Reporting by major line of business;
- \* Gross approach in accounting

for government grants and recognition of non-monetary assets at fair value;

- \* Reporting Impairment of long lived assets;
- \* Quantification of contingency reserve for construction contract in revenue recognition under percentage of completion method;
- \* Reversal of expensed R&D cost;
- \* Recognition of unrealised foreign currency gains;
- \* Use of fair value in acquisition;
- \* Scrapping of LIFO as an inventory costing formula;
- \* Expensing of borrowing cost incurred during the preoperating stage;
- \* Expensing asset-related exchange variation loss;
- \* Accounting for goods and services tax.

## 2. Environmental Reporting

Formulating an environmental reporting system is a great challenge to the accounting profession considering the corporation's responsibility towards environment protection. Although green accountancy is hotly debated in the West, there is not much progress in developing an environmental disclosure norms. A 1990 Survey (2) on 125 major US

Companies revealed that only 11% had accounting policies specifically addressing environmental accounting.

Bulgaria has introduced environmental accounting in 1992 through the Accountancy Act (3). This Act requires completion of two types of statistical forms to produce a single source of accounting and statistical information. All companies complete a form entitled "Environmental Protection-Costs", which contains details of expenditure for environmental purposes on non-current assets such as construction, rehabilitation and preservation costs of sites, the upgrading of equipment and intangible assets such as software and patents. The cost of maintaining these "environmentally motivated" assets is also reported.

In October, 199, the Canadian Institute of Chartered Accountants (CICA) (4) has also published a study, by which it has been attempted to guide the organisations on the various matters that should be taken into consideration while reporting on environmental performance.

In France, a concept of 'Ecological Balance Sheet' (5) has been developed, which concerns the relationship between an enterprise and environment. The ecological balan-

ce sheet contains information about the acquisition and utilisation of equipment used to reduce pollution, recycled by-products and reduced energy and raw materials consumption.

A recent study by the Institute of Chartered Accountants in England and Wales (6) recommended a framework for environmental reporting which includes the following elements :

- (a) Details of the corporation's environmental policy, not in the sense of an immediately attainable goal but more as an ideal to which the corporation will continuously strive. Also a mission statement should be prepared which describes the day-to-day efforts of the corporation to control its environmental impact;
- (b) A statement of concrete objectives, preferably stated in specific, auditable terms, that are attainable within a relatively short period of time;
- (c) Narrative disclosure of the company's activities which address core business issues rather than peripheral matters. These activities should be disclosed comprehensively on a site-by-site basis, be comparable to some acceptable predetermined standards, and be formulated in specific rather than general terms;

(d) Quantitative disclosure of the corporation's environmental impact. The data should be both technical and financial, preferably integrated where possible. The following topics should be included: emission levels; energy consumption; noise; levels; waste production and recycling;

(e) Quantitative disclosure of the following financial information to the extent that it is related to the environment :

(i) policy disclosure of the following financial information to the extent that it is related to the environment related aspects of financial statements;

(ii) Contingent liabilities;

(iii) Fines and penalties levied under environment protection laws;

(iv) Rehabilitation costs of hazardous waste disposal sites;

(v) Costs incurred on disposal of wastes;

(vi) Future costs which may arise from closure or abandonment of operating facilities;

(vii) Costs associated with the acquisition, installation and operation of environmentally sound equipment;

(viii) Costs associated with the redesign of products and processes to reduce reliance on hazardous materials and to minimize waste;

(ix) Legal, consultancy and administrative costs incurred to comply with environmental laws and regulations.

In the USA accounting standards do not comprehensively address environmental accounting issues. However, there are a number of rules on the reporting and recording of costs and liabilities that pertain to environmental matters.

ISAR conclusions (10) also recommend certain environment disclosure norms more or less in the line of ICAEW Study. Based on the above-stated research studies and conclusions of the accountancy bodies/groups in some developed Countries / UNCTAD, it is possible to frame an acceptable norms for environmental reporting. The professional accountancy bodies in the developing countries should also urgently take up the environmental reporting issues.

### 3. Going Concern Disclosures

Whether a business entity able to continue as a 'going concern' is an important guiding principle for the preparation and presentation of financial statements. In view of the widespread industrial sickness both in the developing and developed countries, users are increasingly concerned about the degree of 'going

concern' certainty. There is an emerging consensus that the company management should assess and disclose the degree of certainty involved in the 'going concern' presumption adopted for the valuation of assets and liabilities of the company. In case, going concern assumption is not tenable, reliability and relevance of the accounting data is mostly lost. The Cadbury Committee report in the U. K. recommended for a code of corporate governance.

Broad parameters of identifying going concern uncertainty by the directors has been mentioned in the U. K. document "Going Concern and Financial Reporting : Guidance for Directors of Listed Companies Registered in the U. K." In brief, the said document suggests the directors to look into the—

- \* Forecasts and budgets;
- \* Borrowing requirements;
- \* Liability management;
- \* Contingent liabilities;
- \* Products and markets;
- \* Financial risk management;
- \* Financial adaptability and
- \* Other factors including consistency of earnings, stability of cost base, recurring operating losses, arrears of dividends, work stoppage and labour difficulties, loss of key management

or staff, loss of key franchise or patents, high stock level, obsolete stock, long over due debtors, potential loss on long term contracts, continuance with old fixed assets bearing high operating cost because of inability to replace the same; to form an opinion about the validity of going concern assumption.

A recent Canadian study (8), sponsored by the Canadian Institute of Chartered Accountants states that the "going concern" becomes questionable or invalid upon the actual or anticipated occurrence in the foreseeable future of the earliest of the following events—

- \* E1 : an entity becomes unable to meet its obligation without initiating actions outside the ordinary course of operations to rescue the entity from financial distress or insolvency;

- \* E2 : management launches actions outside the ordinary course of activities of the entity to rescue it from financial distress or insolvency - lower the degree of expected success of such an attempt, higher is the degree of uncertainty;

- \* E3 : management loses control over the assets and liabilities of an entity to a lender or creditors through a formal appointment of a receiver or a less formal involve-

ment of any operating agency;

- \* E4 : management loses control over the assets and operations of the entity to a trustee in bankruptcy.

The CICA sponsored Study (8) has suggested to classify the degree of uncertainty into four different states of health of the reporting entity for the purpose of analysing going concern uncertainty. These are—

- \* Significant Doubt
- \* Substantial Doubt
- \* Very Substantial Doubt
- \* Total Disbelief.

In case there exists significant or substantial doubt about the going concern status of the reporting entity, it is suggested that disclosure is necessary to prevent the financial statements prepared following “going concern” assumption being misleading along with the management’s plan for dealing with the situation. A statement showing adjustments is necessary in assets, liabilities, revenues, expenses, etc. if the going concern assumption is considered inappropriate.

In case there exists very substantial doubt about the going concern status of the entity, financial statements should be prepared following accounting principles established for contingencies. In addition a disclosure is necessary

to indicate—

- \* the assets and liabilities most affected, including change in the carrying amount reflecting approximate market values;

- \* anticipated change in reported revenues and expenses related to the above;

- \* anticipated reclassification of assets and liabilities from long term to current.

In case of total disbelief about the “going concern” assumption financial statements should be prepared following liquidation basis.

The above-mentioned four states of doubt as indicated in the CICA study is logically framed and should be used by the Company management in forming opinion about the ‘going concern’ status of the entity. Also, these findings should be culminated into an accounting standard.

#### 4. **Developments in Segmental Reporting**

Segmental information is considered necessary to assess the performance of the reporting entity by each major segment. In case the company’s lines of business (LOBs) are different, performance projection based on aggregate past data cannot be relied upon because c



divergent cost and revenue patterns across the LOBs.

IAS 14 "Reporting Financial Information by Segment" identifies industry and geographic segments and requires disclosure of (a) sales and other operating revenues derived from the outside customers and other segments, (b) segmental results, (c) segment assets employed, either in money terms or in terms of percentage to total assets, (d) the basis of inter segment pricing. Industry segments are characterised by distinguishable line of products or services, or distinguishable group of related products or services.

A recent Canadian study (9) considers such definitions of segments as very broad for the purpose of financial reporting and suggests replacement of the concept of industry segment by business segment. A business segment is characterised by distinguishable line of products or services that are subjected to identical risks and rewards. In the U.S. also a recent FASB Research Report (10) raises various issues to improve the existing segmental

disclosure requirements as contained in FAS 14.

In India, neither accounting standards nor the company law requires segmental disclosure although large number of Indian companies have disimilar LOBs. Company law requires disclosure of information relating to sales, purchases, raw material consumptions, opening and closing stocks by major class of goods which involves unnecessary compilation of some unrelated financial information.

Wipro Ltd., a diversified and integrated company with five subsidiaries - Wipro Infotech Ltd. (92%), Wipro System Ltd. (87%) Wipro Financial Services Ltd. (81%) Wipro Investments Ltd. (100%) and Inlec Investments Ltd. (100%), voluntarily releases disaggregated information in 1992-93 but discontinued the practice in 1993-94 (Table 1). Difference in return across the LOBs were largely different and also its market share. Any investment analysis based on aggregate financial information of the company would be apparently mislea-

ding. Despite of the glaring differences in the results across the LOBs, the company discontinued the voluntry release of segmental revenue and profit.

Table—1  
Disaggregated Financial Information of Wipro 1992—93

	Sales (Rs. in Million)	PAT %	% of PAT to sales
Information Tech.	2538	79	3.11
Consumer Products	2111	40	1.90
Health Care	711	23	3.23
Engineering	262	14	5.34
Lighting	37	(16)	
Fin. services	21	10	47.62
Consolidated	5715	158	2.77

Considering the wide variation between the segmental performance and the overall performance, there is a need for rationalising, the definition of reporting segments as suggested in the Canadian Study.

#### 5. Gross approach in Accounting for Government grants and recognition of non-monetary assets at fair value

Assets related to government grants are recognised following two alternative approaches :

(I) Gross approach by which assets are shown at their cost / fair value; related government grants are carried and systematically recognised as revenue over the

useful life of the fixed assets.

(II) Net approach by assets are shown at cost/fair value net of government grants.

In case of net approach, value of assets are not reflected properly in the balance sheet resulting in an understatement of asset employed and net asset value per share, and over statement of return on capital employed. Comparability of the financial data of two companies, one of which is the recipient of the Government grants and the other non-recipient, is altogether lost, if net approach is followed.

A representative from China to the 4th meeting of ISAR, UNCTAD (11) was of the view that the government grant should be reported on a gross basis in financial statements, and not on a net method. However, no conclusion was reached in that ISAR meeting.

As regards, the non-monetary government grants, the valuation should be at fair value, although in some developing countries including India accounting norms suggest valuation of such assets at the concessional rates, Valuation of non-monetary government grants in terms of fair value is the best way to reflect the true and fair financial position of the recipient company.

## 6. Reporting Impairment of Long-lived Assets

In the U.S.A., there is a debate on accounting for the Impairment of the Long-lived assets (12). The proposed statement of financial accounting standard on the subject suggests that :—

(1) Long-lived assets and intangibles to be held and used by an entity shall be reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable.

(2) The following are examples of events or changes in circumstances that indicate that the recoverability of the carrying amount of an asset should be assessed :

- a) a significant decrease in the market value of an asset;
- b) a significant change in the extent or manner in which an asset is used;
- c) a significant adverse change in legal factors or in the business climate that affects the value of an asset;
- d) an accumulation of costs significantly in excess of the amount originally expected to acquire or construct an asset;
- e) a projection or forecast that

demonstrates continuing losses associated with an asset.

Financial reporting trend that emerges from this issue indicates that long-lived assets should be reflected in the balance sheet at their fair value instead of the traditional practice of presenting them at 'cost less depreciation' ignoring the impairment loss. In India, the Company Law requires expensing of any **diminution** in the value at fixed assets.

## 7. Quantification of Contingency reserve in revenue recognition for construction contracts under percentage of completion method

IAS-11 (Revised) for construction contracts scrapped the use of completed contract methods for revenue recognition and clearly suggest percentage of completion method. Para 22 of IAS-11 (Revised) requires that an expected loss on the construction contract should be recognised as expense immediately when it is probable that total contract cost will exceed total contract revenue.

In India, some companies have already developed a standard practice of setting aside a percentage of profit to contingency reserve when percentage of completion method is followed. In this context, accoun-

ting policies of Indian Railways Construction Co. Ltd. (1993-94) (13) is worth mentioning. The company accounted for profit on the basis of-

$$\text{Total Estimated Profit} \times \frac{\text{Value of work done}}{\text{Total Value of Contract}}$$

It has appropriated for contingency reserve to cover up any unforeseen eventualities on the following basis :

Completion Stage of contract	Profit to be transferred to Contingency Reserve Account
Below 25%	100%
25% to less than 50%	75%
50% to less than 75%	50%
75% to less than 95%	25%
95% and above	NIL

The standardisation norms followed by Indian Railway Construction Co. Ltd. is practical solution to the problem of ascertaining and providing for possible loss.

#### 8. Reversal of expensed R&D cost

IAS-9 (Revised) "Research and Development Cost" requires that development costs of the Project should be written down when the recoverability of the expenditure from the future benefits is not probable and such written down costs are treated as expense immediately. However, based on the changing

circumstances and persuasive evidence about the recoverability of such development costs reversal of it has been allowed.

In the context of the emerging trend towards valuation of assets including intangibles in terms of fair value, it is probable to revalue the development costs as an intangibles instead of reversal of expenses.

#### 9. Recognition of unrealised foreign gains

Accounting Standards on foreign currency translation developed by International Accounting Standards Committee and many developed and developing countries require recognition of unrealised foreign currency gain of current transactions arising out of year end adjustment. Traditionally, the companies are recognising the losses arising out of year end adjustments of foreign currency, current assets and liabilities. The recent trend shows a major departure from the well accepted accounting principle of prudence. Prudence does not justify anticipation of profit but suggest to recognise all possible losses.

#### 10. Use of Fair value in Acquisition Accounting

Recently, the Accounting Stan-

dards Board in the U. K. has issued FRS 6 "Acquisitions and Mergers" and FRS 7 "Fair Values in Acquisition Accounting". These two financial reporting standards clearly reflect the increasing consensus towards adoption of merger accounting only in the exceptional circumstances. Five criterias used in FRS 6 for determining whether a combination should be ranked as merger include similarity in the relative sizes of the combining entity. In fact, size disparity is an important aspect by which an acquisition or merger can be clearly distinguished.

FRS 7 in the U. K. requires that assets and liabilities taken over in acquisition should be recognised in terms of fair value to avoid over or under-statement of financial position treating the difference of purchase consideration as positive / negative goodwill. The agreed upon value of assets and liabilities in an acquisition deal may not necessarily reflect fair value.

#### 11. Scrapping of LIFO as an Inventory Costing formula

IAS 2 ( Revised ) "Inventories" suggests FIFO and weighted average as benchmark cost formulas and LIFO as an allowed alternative for the determination of historical cost of inventories. In India, As 2

"Valuation of Inventories" does not make any distinction between FIFO, LIFO and average cost formulas. In fact, both LIFO and FIFO either overstate cost of material consumed / cost of goods sold or closing inventories under different conditions of price movements. Strictly speaking, only average cost should be suggested as the benchmark cost formula.

#### 12. Expansion of borrowing costs incurred during the preoperative stage

Benchmark treatment of IAS 23 (Revised) "Borrowing Costs" requires to recognise all borrowing costs in the period in which they are incurred. Of course, capitalisation option has been retained as an allowed alternative in the revised IAS. Of the benchmark and allowed alternatives, it is most likely that companies with low profitability would opt for the allowed alternative. Capitalisation of borrowing costs may overstate the value of fixed assets as compared to their fair value.

Traditionally, Indian companies capitalise borrowing costs related to acquisition of fixed assets/construction of projects till the asset is ready for commercial use or the project is commissioned. Recommendation contained in the Guidance

Note and Statement issued by the ICAI provides theoretical support ( 14 ). Accounting Standard 10 "Accounting for Fixed Assets" issued by the ICAI in 1985 also suggests that financing costs relating to deferred credits or to borrowed funds attributable to construction or acquisition of fixed assets for the period up to the completion of construction or acquisition of fixed assets for the period up to the completion of construction or acquisition of fixed assets should also be included in the gross book value of the assets to which they relate (Para 20).

Generally, return on investments during the early years of the corporate life is low in many developing countries. Therefore, it may be difficult to absorb the latest trend.

### 13. **Expensing asset related exchange variation loss**

In India, Schedule VI to the Companies Act requires to adjust exchange variation loss/gain arising out of foreign currency loan/deferred credit relating to purchase of fixed assets from a country outside India in the cost of the assets ignoring the consequential effect on the fair value of such fixed assets. This accounting policy has the effect of distorting the fair value of assets and deferral of exchange loss.

But this policy appears to be suitable for the developing economies having fluctuating currency values as against the hard currency.

On the contrary, IAS 21 allows such adjustments in exceptional circumstances. Para 21 of IAS 21 (Revised 1993) suggests this adjustment in case of severe devaluation or depreciation of a currency against which there is no practical means of hedging and that the loss should be related to recent acquisition of assets.

In the developing countries, it is necessary to review the global standard in the context of the local conditions.

### 14. **Accounting for goods and Services Tax**

Singapore Society of Accountants has recently issued Statement of Accounting Standard-28 (SAS 28) Accounting for goods and Services Tax, which is unique of its nature. SAS-28 requires that sales and other operating revenue shown in the income statement should exclude Goods and Services Tax (GST) on taxable outputs. If it is desired to show also the gross sales and other operating revenues, the GST relevant to those sales and other operating revenues should be shown as a deduction in arriving at

the sales and other operating revenues exclusive of GST. SAS-28 also requires that irrecoverable GST allocable to property, plant and equipment and to other items disclosed separately in published financial statements should be included in their costs where practicable and material.

Companies generally follow divergent accounting policies as regards Goods and Service Tax and its allocation to fixed assets. SAS-28 of Singapore attempts to curb the divergent accounting policies which needs an incisive analysis in India also.

### 15. Recent Development in India

The studies on corporate accounting practices (15) reveal that Indian accounting standards and other Guidance Notes issued by the Institute are persuasive enough to bring in commendable change in the corporate reporting.

Of course, there are some divergent areas like consolidated reporting, capitalization of asset-related foreign currency loss, capitalization of finance cost during the construction period, related partly disclosures etc. In some other issues like accounting for deferred taxation and finance lease items and segmental reporting, the ICAI has

progressed sufficiently.

The ICAI considers that information about the cash flows of enterprise is useful in providing users of financial statements with a basis to assess the ability of the enterprise to generate cash and cash equivalents and the needs of the enterprise to utilize these cash flows. Accordingly, a discussion paper on Cash Flow Statements has been issued which converge to the classification of cash flows and disclosure requirements suggested in IAS (Revised).

Recently ICAI has also revised Accounting Standard-11 ( AS—11 ) “Accounting for the Effects of Changes in Foreign Exchange Rates” which now includes accounting policy for forward exchange contracts. Likewise IAS-21 (Revised), AS-11 also requires recognition of income/loss arising and exchange difference on current transactions.

Recognising the growing trend of business combination in India, the ICAI has issued Accounting Standard-14 ( AS-14 ) “Accounting for Amalgamations”, which classifies business combination into merger and acquisition in the line of IAS. However, AS-14 does not address the fair value approach in case of acquisitions that fall under ‘purchase method of accounting’.

In India, many small and medium sized Companies follow cash basis for recognising the retirement benefits. In order to eliminate this unsound practice and promote the concept of provisioning for retirement benefits on accrual basis, the ICAI has recently issued Accounting Standard-15 (AS-15) "Accounting for Retirement Benefits in the Financial Statements of Employees".

ICAI has also revised AS-6 "Depreciation Accounting" and AS-4 "Contingencies and Events occurring after the Balance Sheet Date". AS-4 ( Revised ) requires "Assets and liabilities should be adjusted for events occurring after the balance sheet date that provide additional evidence to assist the estimation of amounts relating to conditions existing at the balance sheet date or that indicate that the fundamental accounting assumption of going concern ( i. e., the continuance of existence or substratum of the enterprises ) is not appropriate." This is a significant change towards reporting Going Concern uncertainty.

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**FARM ACCOUNTING—ACCOUNTING FOR  
TIMBER PLANTATION COMPANIES.**

*Sujit Sikidar*

In the broad category of farm accounting, accounting for timber plantation companies has assumed wider significance, firstly because no unified standard system of accounting has yet been evolved and secondly large investor population in plantation companies should get full and adequate information about the working of the companies. Full disclosure and transparency of accounting method adopted is urgently needed.

In this context the author discusses hereunder the ideal system of accounting to be adopted by a plantation company.

**Accounting for Timber plantation  
& Forest produce**

The basic problems arising in accounting for timber plantation are: (a) determining which costs are to be capitalised, and (b) computing depletion for the timber cut and felled during the year. One accounting option is that a plantation for deriving long term revenue

Professor of Commerce,  
Gauhati University.

with longer gestation period should be recognised as a fixed asset because they are held for a long period to derive wood therefrom in the long run. A benchmark distinction may be drawn between timber plantation and other fixed asset in that the former becomes operational i. e. suitable for cutting, felling after attainment of maturity over a longer period of time whereas the other fixed assets become operational after a shorter period. Till felling down, a timber plantation appreciates in value year after year because more inputs are added to bring it to its operational stage. Its value starts declining owing to depletion through cutting or felling or extraction of matured or immatured plants or by withering due to aging. Under this option costs of raising timber including costs of clearing, jungle cutting, underbrush, pesticides, manure, seedlings, saplings, fire protection, insurance, boundary demarcation, construction of roads, culverts, wages of watchman, manure, construction of watch tower, watchman-

shed and other capital expenditures on vehicle, tractors, pumping sets, forest road, culvert, bridges, forest bungalow, building, nursery shed, cultivating equipments, tools and appliances for developing nurseries and plantation, should be capitalised since these costs directly or indirectly contribute towards the upbringing of the plantation and its maturity. The recurring expenditure such as costs on seedling, nursery bed preparation, pre-nursery and post nursery care, polythin bag, although incurred on a continuous process ought to be capitalised. The aggregate of all these costs thus accumulated till the beginning of cutting operations constitute the original cost of timber. This cost may be treated as 'Development of Property' or 'Work in Progress' and disclosed under Fixed asset and may be written off gradually with the depletion of timber resources. Similar expenditure incurred after the beginning of the cutting operations i.e. which is not related to the further development of such plantation should be treated as a revenue expenditure and debited to the general profit and loss account. (Ref. Opinion of the Expert Advisory Committee of the Institute of Chartered Accountants of India dated March 23, 1983). This treat-

ment is specially appropriate owing to the reasons that : extremely long period of development of timber is required before revenues are generated from the particular tract; relatively low risk involved in the venture; and the growth of timber increases the value of the property.

Expenditures incurred in raising and nursing the timber plantation on a perpetual basis is collectively called the carrying cost of timber. Even after the cutting has begun, those carrying costs that apply to future production should be capitalised. However, in practice the timber plantation companies in the U.S.A. consider these development costs, regardless of whether incurred before or after cutting begins, as current expense and are naturally charged to Profit and Loss account.

However, other development costs not specifically related to the growing of timber—such as construction of roads, paths, watchman's shed, watch tower, drainage canals, culverts, etc. should logically be capitalised, either as part of the timber cost or in Work in Progress or in separate accounts to be amortized or depleted over their useful lives. (Ref. Accounting for Timber Resources by Davidson).

**Alternative option.** The other alternative view is that a timber planta-

tion should be disclosed as 'work in progress' under 'current assets' till it attains maturity because the process of development of plantation—from the seedling stage to the maturity stage—is a continuous process spreading over a long period of time. The plantation work in progress, treated as an inventory, may be valued at the lower of cost and net realisable value. The latter can be determined on the basis of estimated selling price in the ordinary course of business less estimated cost to be incurred in future for bringing the plantation to maturity, and the cost necessarily to be incurred in order to make the sale. The cost of work in progress would include all expenses for raising timber incurred till the valuation date. It may however, be noted that this treatment is suitable for commercial timber plantation for short duration period say 8 to 10 years. The same may not be ideal for plantation with long term gestation period.

Indirect expenditure incidental and related to planting and maintenance :

This category includes items like salaries of employees, watchmen who are supervising the plantations, appropriate insurance etc.

During the immature stage of plantation, such expenditure may be capitalised as part of the development cost. However, once the plantations become mature and tapping is commenced, this type of expenditure would be of a revenue nature and hence chargeable to Profit and Loss account (Ref. Monograph on Accounting of Rubber Plantation, issued by the Institute of Chartered Accountants of India).

In case of fruit bearing plantation, the state of commercial production should be considered to have reached when the plantation begins to produce that much quantity of fruit which would make it possible to exploit the produce commercially, e. g. making arrangement for sale. The year of commercial production of plantation can not be uniformly applied for all types of plantation rather it varies from plantation to plantation. Hence the year of commercial production should be decided by the management keeping in view the actual conditions under which a plantation is developed on a case to case basis.

In case forest plantation is treated as an inventory, it entails valuation of forest produces on three counts namely; (a) valuation and measurement of standing crops/

trees in the field, (b) valuation and measurement of felled down logs and timbers, and (c) valuation and measurement of fuel, woods, branch of a plant destroyed by storm, natural calamities, etc. The valuation technique has been discussed in the next section.

### Valuation of Forest Inventories

In this context we may take note of Institute of Chartered Accountants of India's ( ICAI ) Accounting Standards on inventory valuation, AS-2, and then International Accounting Standards (IAS) 18, on Revenue Recognition.

AS-2 says inventories should be valued at 'lower of historical cost and net realisable value' in general for general items of inventory. Para 5 of AS-2 further provides that this recommendation does not apply to inventories requiring special considerations such as : plantation, forestry, agricultural commodities and livestock. In rubber plantation companies, inventories of work in progress and finished products of rubber are valued at net realisable value as at the balance sheet date, or at subsequently realised value. This course was supported by Accounting Research Study No. 3 of AICPA. The IAS-18 says on Revenue Recognition—in such cases

when sale is assured under a forward contract, or a government guarantee, or when a homogeneous market exists and there is a negligible risk of failure to sell, the goods involved are often valued at net realisable value ( para 9 ).

The Supreme Court in a judgment against the judgement of Karnataka High Court under the Karnataka Forest Act, 1963, held that, latex is the modern name for cautchoue, which is nothing but natural rubber and forest development tax may be levied on latex.

Social forestry undertaken by a plantation company is a fixed asset. Building, planting machinery, watch tower, motor vehicles, bridges, tools, forest bungalow, culvert etc. are all fixed assets. Forest development expenses incurred phase by phase, expenses creating forest infrastructure will also be treated as fixed asset and hence will be depreciated at an appropriate rate.

While timber produce is a long term inventory. All fixed expenses pertaining to development of forest would go to Forest Development Account or Work in Progress Account and disclosed under Fixed asset. This amount will be gradually amortized with the sale of forest produce.

### **Forest plantation over government land**

Where the forest plantation is developed over a government land, the infrastructure so developed would remain as a fixed asset for the company, and this would be depreciated according to the number of years of lease or actual life whichever is shorter. In the leased hold forest land, expenditure for development of forest would be fixed asset but this would have to be amortized over the residual period after it attains the desired height level. All expenses pertaining to replanting, maintenance, upkeeping etc. in the subsequent years would be treated as revenue expenditure. Such expenditure may be written off in the Profit and Loss Account in the year in which such expenditure is incurred. The term of the lease hold period must be kept in mind while making the revenue treatment.

### **Depletion of timber costs.**

The depletion charge for timber cut during the year is computed on a unit of production basis. The net book value of the timber block at the end of the year is divided by the number of units available for cutting and felling down i. e. the

units on hand at the end of the year, plus the units cut during the year. The net book value will be the estimated realisable value of the timber in the market for that period. This would enable us to arrive at a depletion rate per unit. (Timber units are usually measured in cubic feet).

The unit rate may then be applied to the number of units cut to compute the total depletion for the year. This procedure is followed specially in the USA, Canada for both financial accounting and tax purposes. (Ref. Davidson, Accounting for Timber Resources).

**Recording Accretion :** Some accountants argue that the increase in value (accretion) resulting from growth of standing timber should be recognised in the accounts each year; because of the reason that value can be reliably measured and verified. The stronger point in favour of recognition of accretion and income therefrom is that the key factor in this regard is the growth of the timber, and that this should be reflected in accounts. Recognition of accretion might be accomplished by a debit to the asset account and a credit to either an income or an unearned income account.

However, in practice accretion is seldom recorded in books and for a going concern this is usually avoided and also because of adherence to the realisation principle in accounting and the uncertainty that the timber produce will ultimately be marketed. ( Ref. Davidson, Accounting for Timber Resources).

**Disclosure in financial statements :**  
Recognition of revenue and

expense and disclosure of the same in financial statements is the key part of accounting system. The realisation principle governs the treatment of expenses as capital and revenue as discussed above; the same applies to recording of accretion in the books, calculation of depletion charge.

**ECONOMICS OF BIO-GAS PLANT**

**A BLOCK LEVEL STUDY.**

*Shri A. K. Chattopadhyay\**

*Prof. P. S. Das\*\**

**ABSTRACT**

Despite the claim of the KVIC regarding the technical feasibility, social desirability and economic viability of the bio-gas plants in rural India, the progress in the adoption of this plant has been very discouraging. Against this background it becomes important to re-examine these aspects in the adoption of the bio-gas plants in villages in India in order to explain the slow progress in the adoption of these plants. We also propose to enquire whether class, caste or any other socio-economic considerations play any significant role in the adoption of the bio-gas plants. This study has been conducted on bio-gas plants located in one block in Bankura District in West Bengal.

\* Lecturer, Dept. of Commerce with Farm Management, Vidyasagar University.

\*\* Professor, Department of Economics with Rural Development, Vidyasagar University.

**1. INTRODUCTION**

Shortage of the conventional sources of energy such as coal, petroleum electricity, wood etc. is a binding constraint to the economic growth of a country like India. The distribution of the per capita consumption of energy in our country is skewed in favour of urban areas and the villagers, constituting 70% of the total population, have a negligible share in the consumption of energy. The gross domestic product of a country has a positive association with the per capita consumption of energy. India ranks 113th among the countries in the world in respect of per capita consumption of energy. There is a huge gap between the total demand for energy and its supply in the rural areas. The conventional sources of energy can hardly meet the growing demand for energy in the rural areas. Therefore, there is a continuous search for non-conventional renewable sources of energy in the rural areas. The solar, wind



and bio-gas energy are some of these non-conventional sources of energy. One source of bio-mass energy is the bio-gas plant. The raw materials for bio-gas plant are locally available. It supplies energy for lighting and cooking by the households. It also provides nitrogen-rich manure and creates a pollution-free environment.

Bio-gas plant is a simple processing unit for the production of bio-gas through anaerobic fermentation of organic waste materials like cattle dung, poultry droppings, pig waste, flesh, agricultural waste, green leaves and plants, human excreta (i. e., night soil) etc. The produced bio-gas is mainly a mixture of methane (55 to 65%) and carbon dioxide (35 to 45%) which is highly inflammable and can be used for cooking and lighting. Further, the slurry coming out of bio-gas plant is rich in nitrogen (i. e., N by 2%) phosphorous (i. e., P by 0.4%) and potassium (i. e., K by 2.2%).

The development of bio-gas plant has a long history in India. The scientists of Indian Agricultural Research Institute (IARI) started the study on the anaerobic digestion of cattle dung in the year 1939 and a batch type digester was developed by them by the year 1946. Subsequently, in the year 1951 a

design, known as "Grama Lakshmi Gas Plant", was developed and this design was improved in course of time and was adopted by the Khadi and Village Industries Commission in 1961, which is now popularly known as KVIC design. The bio-gas programme got a big boost with the launching of National Project on Bio-gas Development (NPBD) and creation of the Department of Non-conventional Energy Sources (DNES) by the Govt. of India. Since then works on the improvement of the design continued and as a result several new models of bio-gas plant were developed. They are :

i) KVIC models, ii) Ganesh model, iii) Janatha model, iv) Pragathi model and v) Deenabandhu model. Of these Janatha model and Deenabandhu model have found favour with the plant adopters for their expected higher longevity.

A gas plant usually consists of three parts, namely, (i) Digester in which the raw waste materials ferment or digest, (ii) Gas holder which collects, stores and delivers the gas and (iii) a gas pipe which carries the gas to the points of use. According to the produced volume of gas (measured in terms of cubic meter i. e.  $m^3$ ) there are different sizes of the plants varying from  $1m^3$

to 30m<sup>3</sup>. As per KVIC report 1m<sup>3</sup>, 2m<sup>3</sup>, 3m<sup>3</sup> and 4m<sup>3</sup> plants ( which are generally used by the households ) can supply fuel to feed 6—8,, 10—12, 13—15 and 18—20 people respectively and the respective cattle requirements for these plants are 5—6, 10—12, 15—18 and 20—25. Apart from the size of plant, gas production also depends on the nature of feeding the digester and on the seasons. The use of sufficient water, addition of urine, night soil, flesh from carcasses and groundnut cake to cowdung usually raise the volume of gas formation. As temperature has a determining role in the gas formation ( Because methane-producing bacteria work best at a temperature between 95°F to 100°F ), it varies during the day time and also over seasons with minimum gas production during the winter season and particularly during the night. The life of a bio-gas plant is normally 22 to 25 years and the maintenance and functioning of the gas plant do not cause any problem to the ordinary villagers.

From the existing literature survey we can also add the following arguements in favour of bio-gas plant.

It has been estimated by KVIC (1988) that about 1.3 billion tonnes of wet dung equivalent to 325

million tonnes of dry dung are produced every year in India; about half of this is burnt as cowdung cake. If this entire quantity of cattle dung is used in the bio-gas plants, the bio-gas production can meet the domestic fuel needs of about 43.7 million families which constitute roughly a little over 25% of Indian population. If other animal waste and human waste are added this figure will be much higher.

Dr. Swaminathan of Indian Council of Agricultural Research has estimated that human excreta yields 11lbs of nitrogen per individual per year and cattle dung obtained from the cattle, kept in sheds over night, yields 21.90lbs of nitrogen per head per year. Taking total human and cattle population in India he has estimated that through bio-gas plants 4.75 million tonnes of nitrogen can be produced per year. This will be more than what will be required in 2000 A.D. Further, bio-gas manure is rich in nitrogen and humus contents. The humus helps to improve the physical structure of the soil by increasing its capacity to retain moisture, to prevent water logging etc. Moreover, this manure mixes with the soil completely and quickly. From trial field surveys it has been shown

that taking the yield of a trial plot manured with balanced NPK chemical fertilizer as 100, the yield of that plot with normal compost farm yard manure goes up to 106 and the corresponding figure with digested slurry of the same dry content increases to 115.

As per the report of the National Committee of Science and Technology, bio-gas gives us clean fuel and its use will not alter the heat balance of the earth unlike fossil and nuclear fuels. The collection of firewood from forest resulting in the deforestation can be reduced considerably with the help of bio-gas plant as bio-gas is 20% more efficient than wood and this will also help in preventing soil erosion and maintaining a congenial climatic conditions through prevention of deforestation.

Apart from these direct benefits in the form of availability of power, outside the traditional power sources, availability of cheap and nitrogen-rich manure, restoration of pollution-free ecological balance and conservation of soil and forest, there are other social benefits from bio-gas plant, namely improvement in rural sanitation and standard of living, keeping the kitchen clean and the utensils bright, preventing diseases among villagers (controlling

mosquito and fly breeding and eliminating smoke and soot from kitchen), increasing self-employment potentials etc.

In spite of these good features the rate of adoption of the bio-gas plant is very low in our country. Upto the end of March, 1992, total number of bio-gas plants set up in the country was nearly 1.605 million. Taking the average unit at  $4\text{m}^3/\text{day}$ , annual gas production from these plants would be only 235 million  $\text{m}^3$ , against the potential production of 48,100 million  $\text{m}^3$  of bio-gas (as per KVIC report) in India. Thus, there has been serious under-utilization of potential capacity due to non-adoption of bio-gas plants in our country. This under-utilization of capacity because of non-adoption of bio-gas plant adequately prompts us to choose this subject as our field of enquiry. In this study we examine the economic viability of bio-gas plant by carrying out a cost-benefit analysis of the bio-gas plant. We shall also enquire whether there is any class, caste or any other socio-economic factor bias in the adoption of the plant. From all these considerations we would like to identify the problems and assess the prospects of this plant for making an assessment of the official claims against

the backdrop of actual plant adopters' realisation.

As the field of enquiry we have chosen a block in Bankura district of West Bengal, namely, Chhatna, which is agriculturally backward, being situated in a drought-prone area and having a poor irrigation facilities. This block has a large number of cattle population, covering a wide area of hilly, pasture and forest lands. In this block there are in all 925 plants approximately, mainly of sizes  $2m^3$  and  $3m^3$  and all these plants are installed by individual families. By random sampling method we have chosen 52 plants (19 of size  $2m^3$  and 33 of size  $3m^3$ ) out of 925 plants for primary data collection through personal interviewing method for the year 1992-93. We have also interviewed 14 households, who have shut down their previously adopted plants, to ascertain the causes of discontinuation. We have also collected relevant data from 37 non-adopting households to know the causes of non-adoption. Along with primary data, we have also collected secondary data from District Industrial Centre of Bankura and from a KVIC agent, working in the block to popularise the bio-gas plant. In this block the main raw material used by the bio-gas plants is cow-

dung and that is why these plants are known here as 'Gobar Gas' plants.

In section II different costs of adopting and running the plants of different sizes have been estimated. Section III has been devoted to the consideration of different types of benefits of the plants and examining their economic viability. Section IV deals with the analysis of socio-economic factors behind plant adoptions. In the last section V, the problems and prospects of the project have been explored to suggest certain remedial measures.

## II COST ANALYSIS.

In the cost analysis we have estimated the costs of installation, maintenance and functioning of a bio-gas plant. We have also calculated standard deviations to see the difference in the components of cost among the plant owners. The costs have been estimated either at current market prices (1992-93) when they are available or at imputed prices or shadow prices. To consider the cost of a plant per year we have estimated depreciation cost of the plant along with yearly functioning and maintenance costs. The depreciation cost has been estimated by the straight line method i. e., by dividing the total installation cost by

expected life time of the plant (25 years). The installation cost has been estimated from the past records of 40 plant owners out of 52 sample plant-owners since only these 40 plant owners who have kept their past records.

According to the official estimates ( as per KVIC reports, 1992-93) the installation costs for 2m<sup>3</sup> and 3m<sup>3</sup> plants are Rs 5,550/- and Rs 6,550/- respectively. The installation cost includes costs of brick, cement, stone chips and sand (these along with transport cost would be termed as construction cost), socketed dome pipe, A. C. pipe, cement primer, black enamel paint, iron rod and fitting materials ( sum of these would be called material cost ) and labour charges ( which include

mason charges and charges for digging and construction). The actual installation costs for plants of 2 different sizes are shown in Table 1.

Using market prices of labour and actual transport cost as the imputed costs for family labour and the transport by own carts, the total installation costs are estimated.

From these estimates it is observed that the actual average installation cost is 13.42% lower than the official estimate for a 2m<sup>3</sup> plant and 9.76% lower for a 3m<sup>3</sup> plant. This is so because wage rate and prices of brick and sand are lower, on an average, in this block than the official estimates. A break up of the total installation cost is presented in Table 1.

Table 1. : Actual Installation Cost of the Plants\*

Size of the plant (in m <sup>3</sup> )	No of** plants	Construction cost ( in Rs. ) <sup>++</sup>		Material cost (in Rs.) <sup>++</sup>		Labour charges ( in Rs. )		Total
		Average	S. D.	Avg.	S. D.	Aver.	S. D.	
2	12	2803	3.32	990	1.92	1012	5.03	4805
3	28	3684	2.12	1055	1.85	1172	5.36	5911

Notes : S. D. implies standard deviation, Average means simple

arithmetic mean, \* In 1992-93 prices, \*\* 12 plant owners have

not responded, ++ Including transport cost.

The low values of S. D. s further indicate that costs are more or less the same for the plant owners in each category. S. D. is very low for material cost as materials are purchased from the market at more or less the same prices; whereas they are comparatively high in respect of labour charges and construction costs because labour charge and transport cost for carrying construction materials differ from village to village in the block under study. If we exclude the imputed costs of family labour and transportation by owned cart (since in the presence of surplus rural labour

and seasonal under-utilisation of carts, their shadow prices are very negligible) the installation cost would be much lower; for example, they are Rs. 4212/- for 2m<sup>3</sup> and Rs. 5414/- for 3m<sup>3</sup> plant size. However, here S. D. s are marginally higher as expected because some households have used their own family labour and their own carts while others do not.

Next we have considered the operational cost of the bio-gas plant i. e., input costs which include cost of cowdung for digester and labour requirement for mixing it with the water and pouring it in the digester. The data on per day input requirements are presented in Table 2.

Table 2 : Per day Input Requirements For Running The Plants.

Plant size (in m <sup>3</sup> )	Official Estimation		Actual use by the Plant Adopters			
	Cowdung (in kgs / day)	Labour (in hours/ day)	Sample size	Cowdung on average (in kgs / day)		Labour on Average (in hrs/day)
				In winter	In other seasons	
2	50	0.80	19	50	40	0.75
3	75	1.25	33	75	63	1.00

From Table 2 it is observed that there is a difference between official estimates and actual uses. In this connection it is to be noted

that sample households mainly use bio-gas for cooking purpose and to meet that purpose they use cowdung in the gasplant in lesser quantity

(than the prescribed amount for full capacity utilisation) in the non-winter seasons and more or less the same quantity in the winter seasons when normal gas production is low. In the non-winter seasons the requirement of cowdung is met from the family cattle but for winter season the additional requirement is met by almost all households from collection of cowdung from pasture land through child labour (at the cost of Rs 10 for 2m<sup>3</sup> and Rs 12 for 3m<sup>3</sup> plants per month). The cost of cowdung collected from outside is estimated on terms of the child labour charges and the cost of cowdung of family cattles is the imputed cost. In the rural areas of the sample block there is a market for

cowdung, in which the poor families are sellers (having lower land holding and larger number of cattle) and the rich farmers are the buyers. On an average, it is calculated that the price of one kg. wet cowdung is Re 0.05. The imputed cost is also taken into consideration for estimating cost of family labour and attached labour. Besides, there is another component of cost of a plant, known as maintenance cost which includes painting cost, incurred once in 3 years and labour charges for clearing and cleaning the digester, to be incurred once in 2 years. The total costs on an average per year of the plants are shown in Table 3.

Table 3. : Total Costs of the Plants ( per annum )

Plant size ( in m <sup>3</sup> )	Average** operational cost* ( in Rs. )	Average** Deprecia- tion cost ( in Rs. )	Average** Maintena- nce cost ( in Rs. )	Total Cost	
				Avg.**	Coefficient of Variance
2	855.47+839.50 +30=1724.97	192.20	45.00	1962.17	0.32
3	1140.63+ 1241.00+ 36.00 = 2417.63	236.44	65.00	2719.07	0.14

\* Labour cost + imputed cost of cowdung + cost of cowdung collected from outside. \*\* Average over the plant-owners.

From Table 3 it is observed that coefficient of variation is very negligible in both cases, implying that costs do not vary significantly across the households. For larger plant the variation is smaller. It is further seen that plant 3 is technically more efficient than plant 2 since the unit costs (per unit of  $m^3$  gas production) of these two sizes are Rs. 906.36 and Rs. 981.09 respectively.

#### 1+1 **Benefit analysis and the consideration of economic viability**

The calculation of benefits is more problematic than the calculation of costs. Benefits can be accurately calculated if two situations, before and after adoption of the plant, can be compared given that the factors, other than those which are affected by the plant-sizes, remain constant. But we are not able to follow this procedure as with the change in time *ceteris paribus* assumption is violated and as most of the respondents, having no recorded data, either cannot remember the past situation accurately or are unaware of the

benefits of smaller magnitudes. In official estimates this problem has been solved by considering some laid-down equivalences ( e. g. one cubic meter bio-gas = 0.62 liters of kerosene etc. ) on the assumption that capacity of each plant is fully utilised. But in reality there is no measurement of full capacity utilisation ( in our sample almost all plants are underutilised ). Moreover, the official estimates are highly hypothetical and partial. For benefit calculation we have followed an indirect method. For each plant-owning household we have tried to select the corresponding homogeneous household who has no such plant. Homogeneity is preserved on the basis of family and cattle size, location, social status and economic strength ( measured by the size of land holding ). We have found out 14 such pairs for  $2m^3$  plant and 23 for  $3m^3$  plant. We have calculated the benefits by comparing the household expenditure of these pairs. ( Benefit from the plant = relevant costs incurred by the non-adopter minus those ( if any ) incurred by the plant adopter.

Benefits derived from a bio-gas plant have been broadly classified into two : (i) tangible benefits which are directly quantifiable such as fuel and manure and (ii) intangi-



ble benefits that include (a) smoke and soot free rural homes that improve the health of rural housewives and that protect the utensils and cloth cleaner, (b) saving of cooking time and the time for cleaning the clothes and vessels (the time saved may be used for other productive purposes) and (c) improvement in rural sanitation, restoration of ecological balance and pollution free society, conservation of soil and forestry etc. Through the indirect comparison method we have calculated the tangible benefits as well as the intangible benefits except the items in (c), which are difficult to measure.

In calculating fuel cost we have considered the current market prices of kerosene, coal and firewood. The imputed price for cowdung cake has not been considered here to avoid double counting.<sup>1</sup> Burnt-out cowdung cake reduces the availability of organic manure to the non-adopter, but this does not apply to the adopters who make full use of the manure. The benefit from the use of slurry as manure by the adopter, however,

accounts the imputed cost of burnt out cowdung cake. To calculate the benefit from manure, pesticides and water retention capacity of the soil (i. e., irrigation) from the relevant farm-cost difference of the pair of households; the cost-difference is adjusted by the productivity<sup>2</sup> according to the following formula :

$$\frac{\text{Relevant Farm-cost difference}}{\text{Farm Productivity of non-adopter}} \times \text{Farm Productivity of plant adopter}$$

To obtain an estimate of the intangible benefits we have considered the cost difference between plant adopter and non-adopter-households regarding normal medical expenses incurred for housewives and cost of washing devices; also we have calculated the extra leisure time enjoyed by the plant-owning housewives from cooking and cleaning activities and then valued it at the going market wage rate for female rural labour. The estimated benefits are shown in Table 4.

1. Cowdung cake is mainly used by the non-adopting households, this component would be considered as benefit from fuel of the plant adopting households. This benefit is taken into consideration in case of manure.
2. As rice is the main crop of this block, in which manure obtained from the plant is fully utilised, we have considered only total rice production in the calculation of productivity.

Table 4 : Benefits Derived From The Plant ( per Annum )

Plant size (in m <sup>3</sup> )	Sample size	Tangible Benefit		Intangible Benefit		Total Benefit (in Rs.)
		Fuel (in Rs.)	manure and others (in Rs.)	Leisure Time of Housewives (in Rs.) (a)	Others (b) except Items in (c) ( in Rs. )	
2	14	650.00	424.40	473.97	178.00	1726.37
3	23	780.00	608.62	682.81	208.50	2279.93

To consider the economic viability of bio-gas plant we have to compare the total benefits (Table 4) with the total costs (Table 3). To make it comparable we have to

exclude the imputed cost of cowdung from the estimated total costs since it has not been considered in benefit calculation. The comparable figures are shown in Table 5.

Table 5 : Economic Viability of Bio-gas plant.

Plant size (in m <sup>3</sup> )	With Imputed Labour Cost of Housewives				Without Imputed cost of Housewives			
	Total cost (in Rs.)	Total Benefit (in Rs.)	Benefit-cost i		Total cost (in Rs.)	Total benefit	Benefit-cost	
			ratio	percen- tage			ratio	percen- tage
2	1122.67	1726.37	1.54	153.77	986.35	1252.40	1.27	126.97
3	1478.07	2279.93	1.54	154.25	1283.43	1597.12	1.24	124.44

From Table 5 it is evident that bio-gas plants are highly profitable and plants of all sizes are found to

be economically viable having near about 54% rate of return<sup>1</sup>. Even if we exclude the imputed leisure value

$$1. \text{ Percentage rate of return} = \frac{\text{Total benefit} - \text{Total cost}}{\text{Total cost}} \times 100;$$

Which is comparable with the market rate of interest.

of rural housewives ( as they are mostly unemployed ) benefit-cost ratio is quite high. For example, in the case of plantsize of  $3m^3$ , one rupee invested will yield benefit of worth Rs 1.24. Thus the rate of return is 24% in the case of  $3m^3$  plantsize, whereas it is 27% in the case of  $2m^3$  plantsize. However, if we also exclude other intangible benefits the calculation of which involves high degree of subjectivity and approximation, the rates of return would be as low as 8.9% [=  $(1074.40 - 986.35)/986.35$  ] and 8.2% [=  $(1388.62 - 1283.43) / 1283.43$  ] for the plant sizes of  $2m^3$  and  $3m^3$  respectively. These low rates of return, which are lower than the market rate of interest, may provide plausible explanation for the slow growth of adoption of the plants by the households, who do not properly realize the impact of intangible benefits. But if they could realize these benefits (through effective propagation by the field agents) and if we could measure and include the social benefits in the estimation of benefits and if plants were fully utilised the plant would be highly profitable and also socially more desirable.

#### IV : Socio Economic Profile of the Biogas Plant-Adopters.

Despite the economic viability of the bio-gas plants, the rate of adoption of the plant in villages is very low. The necessary condition for the adoption of a plant is that the supply of a minimum amount of raw materials, for example, cowdung, must be guaranteed. This implies that a plant-owning household must have a minimum number of cattle to ensure this minimum supply of raw materials. But it has been observed from our survey that many of the households owning a good number of cattle do not have bio-gas plants. Hence, we have to look for the sufficient condition.

It is presumed that various other economic as well as social factors are responsible for non-adoption or very slow rate of adoption of the bio-gas plants in the rural areas. In this section we propose to look into these factors. To enquire the causes behind this we have examined the socio-economic profile of the plant adopters which considers size of land holding, level of education, family size and caste of the plant adopters. Table 6 exhibits the results.

Table 6 : Socio-Economic Profile of the plant Adopters.

Cultivable Land holding		Education Level		Family size		caste	
Class (in acres )	No. of plants	Level	No. of plants	Size (in no.)	No. of plants	Category	No. of plants
4.9 – 5.9	06	Matriculation	32	5–7	19	Upper caste	12
6–10	36	Bachelor degree	16	8–10	18	Middle caste	34
Above 10	10	Master degree	04	More than 10	15	Muslims	06
Total	52	Total	52	Total	52	Total	52

It is observed from Table 6 that none of the sample households with cultivable land holdings of less than 4.9 acres own a plant. One possible reason is that the small farmers with small land holdings have smaller number of cattle than the prescribed lower limit. The plant is concentrated mainly among the households with land holdings of 6.7 acres to 10 acres. Large farmers, having generally large family size, are perhaps reluctant to install the plant because the quantum of the fuel and manures produced by the small plants (which they can afford to install with low cattle population<sup>1</sup>) is inadequate in comparison to their demand.

It is interesting to note that the plant adoption is positively associated with the education level of first

generation of the family i. e., either head of the family or at least one of his brothers (having educational qualification-not less than matriculation). Regarding family size we do not get any distinct pattern. Finally, it is seen that the plant-owners mainly belong to either upper caste or middle caste. None of the plant owners among the sample households belong to either S.C/S.T. or any lower caste categories, though some of them have favourable economic conditions.

## V : CONCLUSION AND POLICY PRESCRIPTIONS

From the above analysis it is observed that despite the plant's technical feasibility social desirability and economic viability,

1. Cattle population is not observed to vary directly and proportionately with the size of land holding.

the rate of adoption of bio-gas plants has been very slow. Besides, whatever progress has been recorded, it has remained confined more or less among the educated medium farmers of middle caste category. The reasons underlying the projects' slow progress can be listed as below :

i) Some of the existing plants owned by the households of social standings have been out of use owing to defective installation of the plant.

ii) Owing to improper monitoring and feeding most of the on-going plants are under-utilised. And

iii) as these plants have no direct cash return the plant-owners can hardly realise their real benefits.

Other inherent social factors are :

i) Small and marginal farmers are unable to install it owing to small number of cattle owned by them;

ii) Illiterate farmers are not enterprising enough to adopt new venture,

iii) Shortage of liquid cash of the rural households and the apathy of the bank officials to give advances against this plant also create some major obstacle,

iv) Social taboos not to use night soil lead to losing a vital part of

the input and lastly,

v) inefficient and indifferent attitude of the government officials and the overestimated propaganda on the efficiency of the plants by the field agents are also of no less importance.

The following policy prescriptions may be made for the speedier adoption and better functioning of bio-gas plant :

i) A separate government department has to be formed, that will work in collaboration with local panchayets not only to execute but also to carry on regular monitoring of the project, so that plants are utilised at full capacity. Scientific researches for upgradation can be passed from laboratory to rural houses and mass awareness can be raised with regular campaigning.

ii) For installation of the plant the present policy of granting subsidy should not be abolished, as the plant has social benefits in addition to private benefits. The availability of bank loan should be made easy.

iii) Integrated plan should be evolved by co-ordinating rural sanitation and dairy development with the production of bio-mass energy. More specifically, advances for dairy under Jawahar Rojgar Yajona should be given in sufficient amount and should be linked with the

installation of bio-gas plant. Rural sanitation should be encouraged and a pipe line should be tagged from latrine to plant digester.

iv) Formation of community bio-gas plant should be given emphasis so that the small and marginal farmers can also be able to take its advantage in mutual co-operation.

Last but not the least, v) overall social development ( in the form of mass literacy, mass health, enterprisingness etc. ) is the minimum precondition for its success.

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**PRIVATISATION OF INSURANCE SECTOR—HOW MUCH RATIONAL ?**  
( A study with special reference to life insurance industry )

*Arindam Gupta\**

THE MAIN ISSUE—MALHOTRA  
COMMITTEE'S RECOMMENDATIONS :

For establishing a more efficient and competitive financial system suitable for the requirements of Indian economy, the Government of India appointed a Committee on Reforms in Insurance Sector under the Chairmanship of former Governor of RBI, Shri R. N. Malhotra. The Committee was asked to study the working of Insurance Corporations and to make "recommendation of changes in the structure of the insurance industry and in the general policy framework, keeping in mind the changes that are taking place in other parts of the financial system and in the economy". The appointment of this Committee was nothing but a result of the finance minister's

budget speech in which he stressed the need for reforms aimed at introducing a more "competitive environment" subject to suitable regulation and supervision. The Committee submitted its report on 7-2-1994. Some of the important recommendations made by the Committee are as follows :

— Private sector be granted to enter insurance industry with a minimum paid up capital of Rs. 100 crore.

— Foreign insurance companies be permitted to enter by floating an Indian company preferably a joint venture with Indian partners.

— State level cooperatives be enabled to set up cooperative societies not more than one in a state of transacting life insurance business subject to regulation by the insurance regulatory authority. Their capital base should be appropriately lower.

— Post life insurance be granted to transact life insurance business in rural areas among the general public. It should be suitably strengthened.

\* Faculty Member, Deptt. of Commerce with Farm Management, Vidysagar University & Guest Faculty Member, Deptt. of Business Administration, Burdwan University.

— Steps be initiated to set up a strong and effective insurance regulatory authority in the form of a statutory autonomous board on the lines of SEBI.

— The office of the Controller of Insurance be restored its full functions under the Insurance Act and set up as a separate office.

— Life Insurance Corporation of India (LIC) be converted into a company and its capital should be raised to Rs. 200 crore, 50 per cent to be owned by Government and the rest by public at large with suitable reservation for its employees.

— Capital of General Insurance Corporation of India (GIC) be also raised to Rs. 200 crore, 50 per cent to be owned by Government, the rest by public at large with suitable reservation for its employees.

— There will be a full re-structure of LIC. Its Central office should be a compact and highly professionalised establishment concentrating on formulation, investment, product development, actuarial valuation, personnel policy and accounts of the corporation.

— Zonal offices of LIC be converted into its Head office for insurance business and related matters in their jurisdictions and zonal managers be made members of LIC board.

— GIC to function exclusively as a

re-insurance company and as Indian reinsurer under the Insurance Act.

— Four subsidiaries be fully delinked from GIC by acquisition of entire stock in each of them by the Government.

— Capital of each subsidiary be thereafter raised to Rs. 100 crore, with 50 per cent equity held by Government and rest by public at large with suitable reservation for concerned employees.

— Tariff Advisory Committee (TAC) be delinked from GIC to function as a separate statutory body under necessary supervision by the insurance regulatory authority.

— Landless Agricultural Labourers Group Insurance (LALGI) and Integrated Rural Development Programme (IRDP) beneficiaries schemes, Personal Accident and Social Security (PASS) and Hut Insurance Schemes of general insurance which are relief-oriented welfare schemes be transferred to the concerned Government authorities.

— All insurance companies be treated on equal footing and governed by the provisions of the Insurance Act. No special dispensation be given to LIC, GIC and its four subsidiaries.

#### **Background in Brief :**

Mr. Peter Grant, Chairman of the UK-based Sunlife-Assurance



Society, who came to India in January 1993 as a member of the high-level business delegation accompanying the British Prime Minister, Mr. John Major, announced that Sunlife company was likely to launch an open-ended unit trust scheme for international investment in India with Sunlife itself acting as a market maker. The company hoped to receive 30 per cent stake in a joint venture with LIC of India but Mr. Grant did not hesitate to add, "in 10 to 15 years' time, we may want to operate on our own".<sup>2</sup> The press reports, not denied by the government sources, also conveyed that there UK Companies—Prudential Insurance, Eagle Star and Greysam Insurance—wanted to step into the life insurance business in India while two UK firms had sought permission to operate in general insurance. It was already clear to knowledgeable circles as to which way the wind was blowing. In September 1992, Mr. K. P. Narasimhan, the then LIC Chairman, expressed, "... the insurance industry was likely to face a lot of competition in future, particularly from the private sector and from outside the country in the wake of the liberalisation policies and pressures from the International Monetary Fund (IMF) to open India's insurance

industry to the world." (Financial Express—17-9-1992). On the issue of multinationals, access involved in financial operations like insurance. India was under tremendous pressure from the Uruguay Round of General Agreement on Tariffs and Trade (GATT) negotiations. According to the trade unions, the US administration continued to threaten that it would revive and use Section 301 of the US Trade Act of 1974 whereunder it could bypass GATT and other international mechanisms and unilaterally initiate actions against the countries which denied US insurers' access to their domestic markets<sup>3</sup>. The recommendations of the committee, considered in this backdrop, may naturally appear to be some sort of an advance signal to indicate the readiness to bow down to external threats.

#### **Why was Life Insurance nationalised ?**

There were over 245 insurance companies, both Indian and Foreign, engaged in competition for business when the Government, in the year 1956 took them over and Life Insurance Corporation of India was thus formed. While moving the Bill for the nationalisation of life insurance, the then Finance Minister, Mr. C. D. Deshmukh said : "We entered on the study with no pre-

conceived notions and it was conducted strictly on pragmatic lines. This study was a prolonged and comprehensive one. Even the first examination in 1951 pointed towards nationalisation as the obvious step. Loans were given on every type of security—good, bad and indifferent—loans on shares, agricultural lands, barges, standing sugarcane crops and libraries as well. With the tightening of the provisions regarding loans in 1950, we thought that these tendencies would disappear, but they did not. In 1950, we amended the Act to limit the shareholding of any one person to 5 per cent of the capital of the insurance company. The act was circumvented by holding shares in the names of family members, friends and employees. Another amendment at the same time prohibiting payment of excessive emoluments to officers was circumvented by appointing all dummies, the whole or substantial portion of their salaries being passed on to those who controlled the companies. Legislative control has been tried long enough and it would have been difficult to justify persisting with it any longer.” He also observed. “In a nationalised set-up, competition would have a restricted field and could only be in terms of

either efficiency in service or in the rate of development of new fields of business and we believe that competition of this nature could be achieved through Zonal Organisations contemplated in the Bill without creating other competitions..... It would be extremely difficult, if not impossible, to stamp out some of the evils of competitive business such as, for instance, rebating”.

Before nationalisation, the rural areas were totally neglected and so also the industrial workers. Social insurance was unknown. The policyholders' money was cheated. From 1945 to 1955, 25 companies went into liquidation while another 25 ran into so much loss that their business had to be transferred to other companies at a loss to their policyholders. In 1956, LICI was formed with the following objectives :

- (1) Spread the message of insurance in every nook and corner of the country.
- (2) Maximise mobilisation of profit.
- (3) Bear in mind proper investment of fund.
- (4) Conduct business with utmost economy.
- (5) Act as trustees of the insured public.

- (6) Meet the various insurance needs of the society.
- (7) Involve all people working in L. I. C. I. to render effective and efficient policy servicing with courtsey, and
- (8) Promote a sense of pride and job satisfaction.

**Competition And Efficiency—A Concept Consistently Refused in Insurance Sector :**

In USA, there are 3500 insurance companies but only 15 leading companies ( 0 4 per cent ) control 50 per cent market. Therefore, the concept of competition is unreal. Always, perhaps it is true not only in the insurance sector but in all other sectors, the big companies swallow the smaller companies in the so-called competition and thus emerging as the giant monopolies defrauding the consumers. The competition in the insurance sector was found to have been invariably breeding unhealthy practices in the U.K., where the 'Norwich Union' insurance company was found to have "wrongly" advised five lakh people to transfer from occupational pension scheme into the company's pension scheme.

The observations of the various committees appointed for examining the LIC's working may be summarised hereunder.

The Working Group of Administrative Reforms Commission (1968) :

"It was the evil of competition that mainly influenced the government to embark upon nationalisation. Now to suggest that the corporation can be split up for the same kind of rehearsal does not appear to us desirable in view of the past experience. The deficiencies in the corporation's working are not due to its monopolistic or monolithic size or nature. The corporation has now taken a definite shape and it is advisable to make improvements in the present organisation rather than disintegrating it into many parts, in the pious hope that several corporations will function more effectively. Further, once the process of fragmentation starts, there may be no stopping it. It may eventually lead to each state having its own corporation with all its entanglements".

The Committee of Enquiry into the expenses of LIC ( 1969 ) :

"The remedy lies in decentralisation and not in multiplying the number of corporations, and this decentralisation can be achieved even in the unitary set-up. Examples of Metropolitan and prudential insurance companies show that the operational efficiency has nothing to

do with the size of the company”.

Era Sezhiyan Committee ( 1980 ) :

“The competing corporations setting up offices throughout the country will add to the cost. The competition will increase the cost of production of business and lead to unhealthy practices like rebates to policy holders. For improving premium rates and bonuses, the competing corporations will neglect extension of business to the rural areas and to the weaker sections of the community. Again, competition by itself does not help in improving performance of customer services.

#### **The Story of LIC'S Success :**

Since nationalisation in 1956, Life Insurance is known more for its social service than doing only insurance business. Gross misuse of the policyholders' hard-earned money for the family interests of the owners of private companies was no more observed after the nationalisation took place. And if we consider LIC'S performance from business perspective only, then also we can realise that LIC is growing by leaps and bounds. Some of the facts are given as follows :

1. The annual new business has

gone up from Rs. 240.51 crore in 1955 to Rs. 42017.23 crore in 1993-'94 to Rs. 55472 crores in 1994-95 ( The Statesman—02-09-95 ).

2. In the 1970 s LIC branched out to mass insurance through group insurance schemes. The new business figure in group schemes is Rs. 38728.88 crores in 1993-94. Total Life Fund was Rs. 380 crore at the time of nationalisation. At present, it is Rs. 59976.62 crore. ( as per 1994-95 figure ).

3. Under group insurance scheme millions of people have been insured thus benefiting organised sector of workers. Before nationalisation, there was no group insurance in the private sector.

4. Almost 45% of LIC's new business comes from the rural areas. Before nationalisation, there was almost no rural business.

5. Under social security schemes, millions of people have been insured. LIC gives 50% subsidy for premia under these schemes.

6. The Renewal Expense Ratio of most of the private companies was around or over 15 per cent. In case of LIC, it is now 6.32 per cent.

7. From 1957 to 1993-94 the business in force has gone up from Rs. 1,476.52 crores to Rs. 2,08,619.05 Crores ( For individual business )

and business in force for Group business is Rs. 46,742.95 Crores in 1993-94.

8. The LIC's performance in settlement of claims compares favourably with that of life insurance companies in USA and U. K. The proportion of claims outstanding to the claims payable ( in number ) has come down to about three per cent. 75 per cent of death claims are now settled within 75 days of intimation while large majority of maturity claims are discharged before the date of maturity and paid on the due time.

9. The percentage of outstanding claims to claims intimated ( by amount ) is only 5.26 ( 1994-95 ) while the same was 59.49 in 1954 in the case of New India Insurance Company of the Tatas and 74.70 for National Insurance Company of the Singhanias.

10. Bonus to policy holders has significantly moved up from Rs. 12.80 in 1957 to Rs. 34 in 1983 to Rs. 67 in 1993 to a minimum Rs. 69 and a maximum Rs. 78 in 1995 per thousand sum assured per year in respect of endowment policies. This is in addition to continuously escalating terminal bonus.

11. Contrary to the experience of various other undertakings, the Government has been the greatest

beneficiary of the LIC's increasing prosperity. In 1991-92, the LIC paid to the Government of India an amount of Rs. 254.90 crores by way of income tax and another sum of Rs. 104.62 crores as dividend on its capital of Rs. 5 crores. Data are not available for the subsequent years for this purpose.

12. Keeping in mind the primary obligation of the Corporation to its policy holders, as enshrined in the objectives of nationalisation, the funds of the Corporation are deployed to the best advantage of the Policyholders as well as the community as a whole. The funds so invested for the benefit of the community at large have accumulated to Rs. 59,979 crores as at 31st March, 1995 after meeting the liabilities towards the claims, management and other expenses, registering an increase of Rs. 10313 crores during the year 1994-95. The total investment made by the LIC in the Socially Oriented Sector including investment in Central/State Government securities and Government guaranteed marketable securities as at 31st March, 1995 amounted to Rs. 46,513 crores.

13. The Corporation has been promoting social welfare through socially oriented investments. These investments are regulated by the

Government from time to time to benefit the people at large by providing basic amenities like potable water, drainage, housing, electrification and transport. The investment in the piped water supply and drainage schemes as at 31st March, 1995 was Rs. 1753 crores. The investment of the Corporation in the power sector was R. 6,915 crores as at 31st March, 1995, thus reflecting the corporation as the largest single contributing factor in the progress of electrification to housing development activities by way of loan to State Government, State-level Apex Societies, HDFC, HUDCO, NHB, LICHL, etc. and loans under Mortgage Housing Schemes and corporation's own building construction, township development, etc. amounted to Rs. 7,812 crores upto 31st March 1995. The total investment of the Corporation in assisting development of road transport by providing financial assistance was Rs. 407 crores as at 31st March, 1995. All the lendings were at a very low rate of interest, which could not be imagined by the profit-seekers.

14. The Corporation helps small scale and medium scale industries by granting loans for setting up Co-operative Industrial Estates and an amount of Rs. 45 crores has so far

been advanced to Co-operative Industrial Estates and Industrial Development Corporations.

The Corporation's assistance to State-level Finance Corporations and All-India Finance Corporations like IDBI, IFCI, ICICI, etc. by way of subscription to bonds debentures issued by such institutions, also indirectly helps development of small-scale and medium-scale industries. The total investment by way of loans as at 31st March, 1995 was Rs. 4,478 crores and by way of subscription to shares debentures was Rs. 6,878 crores. All these make a distinct contribution towards growth in industrialisation.

#### **Foreign Entry ...Thinking of Other Countries**

Restrictions were imposed by New York on reinsurance business and the establishment of New York Insurance Exchange, which was associated with the desire of expansion of the domestic market and maximisation of premium retention with in the USA.

The Japanese market also does not permit entry of foreign companies in their insurance sector.

Germany prohibits imports of insurance for domestic risks. France also does not permit entry of foreign insurers.

Norway also has not permitted entry of foreign insurers for the last 45 years.

The traditionally liberal and profitable Swiss market has permitted only 3 per cent of premiums to be underwritten by foreign insurers.

The main purpose of prohibitions against foreign insurers is to provide the domestic industry with the largest possible volume of business so as to enhance the capacity to indemnify losses and remain solvent in the process.

#### **What will Happen if Private Companies Enter the Insurance Sector ?**

In brief, let us discuss the above point one by one :

1. Insurance investment is presently the safest and most secured one from the viewpoint of the policyholders. The sums assured by the LIC's policies carry Government guarantee.

Will the general people's money get same standard of security from the private insurance companies ?

2. Thinking about the common man's insurance needs, will the private insurance companies engage themselves like LIC in the rural business and small business even when they are very much less-profitable ?

3. Will the private insurance companies think about social security schemes as they require subsidy from the Insurer's central funds ?

4. Will not there be a gradual reduction in mandatory investments in government securities and loans to various institutions ? Will not the private insurance companies like to increase their investments in stock market resulting in an increase in risk and corresponding insecurity of the policyholders ?

5. Will the unemployed youth in the country get the same level of employment opportunity as they have experienced in LIC when competition amongst insurance companies will require cost reduction ?

6. Can the private insurance companies give such guarantee that they will provide same amount of money in the form of loans at the same interest rates for house—building, water supply, sewerage disposal scheme, state electricity boards to be used for electrification of numerous villages or more explicitly, investments in socially oriented sector like the LIC, if they may be allowed to carry on insurance business unitedly in a monopolistic pattern ?

## CONCLUSION

It revealed from the market survey on sample selection basis, conducted by the MARG<sup>5</sup> among the users of life insurance to assess their perception, to find out their satisfaction levels with L. I. C. I. The market survey has brought forth a variety of findings : a majority of individual respondents, who made claims on LIC felt that these were settled satisfactorily (75%), and speedily (67%), although the survey also brought out that average time taken to settle a claim was 87 days; about 64% individual respondents rated the quality of overall services to be excellent or good and only 3% rated it as poor or very poor;—LIC employees were regarded as courteous and helpful;—the individual respondents did not favour the prospect of private life insurance companies for fear that money with private insurers might not be safe.

From the above discussion, it is clear that before starting implementation of the recommendation of the Malhotra Committee, some crucial and important issues should be elaborately discussed. There appears to be two prospective gainers from the proposed denationalization—first, Indian private

companies and secondly, foreign insurance companies. The former is not wanted for 'security' point and the later for 'national' as well as 'security' point. Ultimately, it may happen that due to abnormal financial strength and profitable business strategy of the foreign companies, national private companies may lose their place. LIC, holding previously a monopolistic advantage of doing insurance business in this country as well as acting as a strong supporting hand for the government, doing a great social service, has to face competition from global giants and may lose its present position of profitability to a great extent. Ultimately, the foreign multinationals may rule the insurance world. The question of allowing private Indian companies and foreign companies to enter into the life insurance sector or splitting the LIC into independent competing corporations is one which has very wide implications. An institution like LIC, which has about 6.5 crores policy-holders and a Rs. 215000 crores, so firmly settled on the path of progress must not be destabilised in such an unwanted manner.

The government should initiate a continuous process of dialogue



and discussion with the concerned authorities and arrive at a national consensus on this national issue.

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**ANALYTICAL APPROACH TO LIQUIDITY MANAGEMENT  
OF A FIRM BY RATIO ANALYSIS.**

*Santimoy Patra\**

In order to evaluate the financial position and soundness of a firm, Accounting Ratios of financial data act as a yardstick. Ratio is a quantitative relationship between two figures relating to a point of time or period of time and is useful for evaluation of internal management as well as by prospective investors, creditors and outsiders. Ratio analysis finds its largest application for testing liquidity, solvency, profitability and management efficiency of any concern. Comparison between present and past ratios, and ratios of one firm with those of other similar firm give a realistic judgment.

**Objective of the study :**

A business entity stands the test of time if it is able to accrue goodwill from its business operation and such goodwill can be had primarily by the efficient management of working capital. Efficient working capital management is largely deter-

mined by the appropriate liquidity structure of assets and liabilities. So, for the purpose of existence of a firm this study concentrates on the liquidity aspect and dependency ratios. The study aims at examining critically the extent to which liquidity is truly measured by the conventional ratios.

**Meaning and importance of Liquidity in Working Capital Management.**

By 'liquidity' we mean the ability of a firm to meet its short-term maturing obligations. It has two dimensions :— (1) Period required for conversion of current assets into cash and (2) Degree of certainty of its income on conversion. The capacity of a firm to meet its short-term obligations is so important that sometimes the question of its very survival depends on it. Efficient management of working capital could be ascertained by firm's ability to meet maturing debts. Working capital refers to the funds needed for short-term purposes like purchase of raw mate-

\* Ex student,  
Department of Commerce with  
Farm Management, V. U,

rials, payment of wages and other day to day expenses. Working capital is regarded as the life blood of an enterprise. Working capital management is the management which determines the amount of working capital to be kept in the business considering the degree of liquidity of each component of current assets and current liabilities. Appropriate liquidity structure of assets and liabilities leads to an efficient management of working capital. Efficiency of an enterprise in working capital management is so important that its absence would lead to the sickness of the firm. It will not be out of place to indicate the measurement of sickness criteria as depicted by the Reserve Bank of India which shows that if current ratio falls below 1 for successive years that might lead to sickness.

#### Conventional Computation.

Question may arise as to how the liquidity position is measured and what should be the appropriate liquidity structure. Current Ratio and Acid Test Ratio are frequently used to judge the liquidity position of a firm. Current Ratio is the ratio of current assets and current liabilities, most conventional ratio of which is 2 : 1 (i.e. for every

Rupee one of current liability there should be current assets of Rs. 2). Current assets generally include inventories (raw material, work-in-progress and finished goods), debtors, bills receivable, marketable securities and cash etc, and current liabilities generally include short-term loan, sundry creditors, bills payable, bank overdraft etc. Acid Test Ratio is the ratio between quick assets i.e. current assets excluding inventories and quick liabilities i.e. current liabilities excluding bank overdraft. Some are of opinion not to exclude Bank overdraft from current liabilities. The most conventional norm of Acid Test Ratio is 1 : 1 (i.e. for every rupee of current liability, there should be equivalent amount of liquid assets). Numerically, these can be shown as follows :

(1) Current Ratio =

$$\frac{\text{Current assets}}{\text{Current liabilities}}$$

(2) Acid Test Ratio =

$$\frac{\text{Current assets—Inventories}}{\text{Current liabilities—Bank Overdraft}}$$

These ratios can be calculated taking hypothetical data of Balance sheets in the following three different cases.

**Balance sheet of X Co. Ltd.**  
as at.....

Liabilities	Rs.	Assets	Rs.
Share Capital	1,00,000	Fixed Assets	80,000
Reserves & surplus	20,000	Inventories	45,000
Sundry Creditors	14,000	Debtors	10,000
Bills Payable	10,000	Bills Receivable	5,000
Bank Overdraft	1,000	Cash	5,000
	1,45,000		1,45,000

**Balance Sheet of Y. Co. Ltd,**  
as at .....

Liabilities	Rs.	Assets	Rs.
Share Capital	85,000	Fixed Aseets	60,000
Reserves & Surplus	10,000	Inventories	20,000
Sundry Creditors	30,000	Debtors	20,000
Bills Payable	15,000	Bills Receivable	35,000
Bank overdraft	5,000	Cash	10,000
	1,45,000		1,45,000

## Balance Sheet of Z Co. Ltd.

as at .....

Liabilities	Rs.	Assets	Rs.
Share Capital	45,000	Fixed Assets	40,000
Reserves & Surplus	5,000	Inventories	12,000
Sundry Creditors	4,000	Debtors	6,000
Bills Payable	4,000	Cash	2,000
Bank Overdraft	2,000		
	60,000		60,000

**X Co. Ltd.**

- Current Ratio = 
$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\text{Rs. } (45,000 + 10,000 + 5,000 + 5,000)}{\text{Rs. } (14,000 + 10,000 + 1,000)} = \frac{\text{Rs. } 65,000}{\text{Rs. } 25,000} = 2.6 : 1.$$
- Acid Test Ratio = 
$$\frac{\text{Current Assets excluding Inventories}}{\text{Current Liabilities excluding Bank overdraft}} = \frac{\text{Rs. } (65,000 - 45,000)}{\text{Rs. } (25,000 - 1000)} = \frac{\text{Rs. } 20,000}{\text{Rs. } 24,000} = 0.83 : 1$$

The most conventional current ratio and Acid Test ratio is 2 : 1 and 1 : 1 respectively. But here these ratios come to 2.6 : 1 and 0.83 : 1 indicating that inventories included in current assets are disproportionately larger in comparison with

other items. As inventory is less liquid current asset, management should consider to reduce the amount of inventories, so that immediate payment is possible as and when required. Sales efforts should be strengthened even by extending credit terms. By that, at least, inventories will be converted into Receivables.

**Y. Co. Ltd.**

- Current Ratio = 
$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\text{Rs. } (20,000 + 20,000 + 35,000 + 10,000)}{\text{Rs. } (30,000 + 15,000 + 5,000)} = \frac{\text{Rs. } 85,000}{\text{Rs. } 50,000} = 1.7 : 1.$$
- Acid Test Ratio = 
$$\frac{\text{Current Assets excluding Inventories}}{\text{Current Liabilities excluding Bank overdraft}}$$

$$\begin{aligned} &= \frac{\text{Rs. } (85,000 - 20,000)}{\text{Rs. } (50,000 - 5,000)} \\ &= \frac{\text{Rs. } 65,000}{\text{Rs. } 45,000} = 1.4 : 1. \end{aligned}$$

Here current ratio and Acid Test ratio are found to be 1.7 : 1 and 1.4 : 1, where as most conventional ratios are 2 : 1 and 1 : 1, respectively. It indicates that current assets, specially inventories are lesser in relation to the current liabilities or vice versa. In such case the company may be advised to increase the amount of inventories according to the necessity.

#### Z. Co. Ltd.

1. Current Ratio =

$$\begin{aligned} &\frac{\text{Current Assets}}{\text{Current Liabilities}} \\ &= \frac{\text{Rs. } (12,000 + 6,000 + 2,000)}{\text{Rs. } (4,000 + 4,000 + 2,000)} \\ &= \frac{\text{Rs. } 20,000}{\text{Rs. } 10,000} = 2 : 1. \end{aligned}$$

2. Acid Test Ratio =

$$\begin{aligned} &\frac{\text{Current Assets excluding Inventories}}{\text{Current Liabilities excluding Bank overdraft}} \\ &= \frac{\text{Rs. } 20,000 - 12,000}{\text{Rs. } 10,000 - 2,000} \\ &= \frac{\text{Rs. } 8,000}{\text{Rs. } 8,000} = 1 : 1 \end{aligned}$$

Z Co. Ltd. has been able to show ideal current ratio and Acid Test ratio which are 2 : 1 and 1 : 1 respectively. Therefore the Co. is able to maintain a satisfactory level of current assets and current liabilities,

as we apparently mean. But this interpretation is nothing more than a generalised simplification. Because this approach fails to measure the liquidity of individual components of working capital.

#### Critical Appraisal.

A keen observation shows that current ratio, as obtained above is a crude test of liquidity because it fails to take into consideration the degree of liquidity of individual component of current assets and urgency of clearing current liabilities. Aggregate value of current ratio is not sufficient indicator for testing liquidity. This is so because of non-consideration of the time dimension involved in individual component of current assets and current liabilities. For example, a firm having more inventories with lower cash, B/R and marketable securities belongs to a lower degree of liquidity than a firm having composition of current assets in the reverse ratio. Inventories include raw-materials, work-in-progress and finished goods. Rawmaterial and Work-in-progress both require a considerable time to convert into finished goods. Finished goods awaiting sales also take some time for realisation into cash or like cash through actual sales.

Rather Acid Test Ratio is somewhat finer measure of liquidity as it excludes inventories from current assets and bank overdraft from current liabilities. That is to say, Acid Test Ratio considers only cash and 'like cash' items.

But both Current Ratio and Acid Test Ratio are not free from encumbrance. Generally, short term maturing obligations are paid off after realisation from the amount of investment in different current assets. But all current assets are not of equally liquid and all current liabilities are not payable with equal quickness. The maturity date of different current assets and current liabilities may be different. Current liabilities may be needed to be paid before maturing from current assets. But the firm may not have sufficient liquid assets at

that point of time. Hence the firm will ultimately face 'TECHNICAL INSOLVENCY', inspite of having an ideal current ratio. Technical insolvency occurs whenever a firm is unable to meet its cash obligations'<sup>1</sup>.

Now the question may arise how would the firm overcome this situation? It has two ways. Either the firm has to wait for money to pay off such obligations till the maturity of current assets or it has to bind itself for FORCED SELLING of different current assets. In the former situation its reputation and hence the credit worthiness will be affected and in the latter case monetary loss will result arising out of conversion of current assets at pre maturity period.

To clarify further, some hypothetical data of a firm may be set.

Balance Sheet ( includes )  
as at... ..

Liabilities	Rs.	Assets	Rs.
.....		.....	
.....		.....	
<b>Current Liabilities :</b>		<b>Current Assets :</b>	
Sundry Creditors	4,00,000	Inventories :	
(Payable on 1st April)		Raw Material	400000
Bills Payable	4,00,000	W-I-P	200000
(Payable on 1st May)		Finished goods	<u>600000</u>
Bank Overdraft	2,00,000	(Expected to be converted into cash on 1st July)	12,00,000
		Sundry Debtors (Will be realised on 1st July)	3,00,000
		Bills Receivable (Will be realised on 1st June)	3,00,000
		Cash	2,00,000
	<u>10,00,000</u>		<u>20,00,000</u>

1. Current Ratio =  $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

=  $\frac{\text{Rs. 20,00,000}}{\text{Rs. 10,00,000}}$

= 2 : 1.

2. Acid Test Ratio =

$\frac{\text{Current Assets excluding Inventories}}{\text{Current Liabilities excluding Bank overdraft}}$

=  $\frac{\text{Rs. 20,00,000} - 12,00,000}{\text{Rs. 10,00,000} - 2,00,000}$

=  $\frac{\text{Rs. 8,00,000}}{\text{Rs. 8,00,000}}$   
= 1 : 1.

Sundry Creditors to be paid on 1st April      Rs. 4,00,000  
Cash-in-hand      Rs. 2,00,000  
Bills Receivable may be discounted on 1st April (i. e. before maturity)      2,00,000



Similarly Bills Payable may have to be paid off before realisation on account of Bills Receivable and Sundry Debtors. Cash-in-hand has already been exhausted. Therefore it becomes clear that inspite of an ideal current ratio and Acid Test Ratio, which comes to 2 : 1 and 1 : 1 respectively as computed above, the firm is suffering from TECHNICAL INSOLVENCY.

**Suggestions for effective Working Capital Management based on ratio analysis.**

‘Determining the appropriate liquidity structure of assets and liabilities involves fundamental decisions with respect to firm’s liquidity and the maturity composition of debt’<sup>3</sup>. So a composite maturity schedule should be prepared indicating clearly the date of realisation of individual current asset and the date of payment of individual current liability. Further more, management must look towards credit management of the firm so that current assets should be matured with sufficient amount before the payment of its short-term

debt obligations. Therefore for efficient working capital management vis-a-vis liquidity appraisals, element-wise maturity schedule of both current assets and current liabilities should be prepared and analysed and decision should be taken by the management as such so that the firm may not face any liquidity problem in future.

**Notes and Select Reference. :**

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**OPERATING LEVERAGE V / S  
FINANCIAL LEVERAGE.**

*Pradip Kumar Panda\**

First we should explain the terms 'Lever' and 'Leverage'. Lever is an inducing or Compelling force. Leverage is the action of Lever or the Mechanical advantages gained by it. But it has another implication in business terminology. It describes the ability of a firm to use fixed cost assets or funds to magnify the returns of the share holder. A relatively small change in sales should result in a large change in income ( EBIT i. e. Earning before Interest and Tax.) We should mention here the term degree of Leverage for discussion on the topic. The higher the degree of Leverage, the higher is the risk. But higher risk implies the degree of uncertainty the firm has to meet the fixed payment obligations ( i. e. operating Fixed cost and cost of debt Capital ) on the one hand and possibility of higher rate of return to the share holders on the other.

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\* Ex-student,  
Department of Commerce  
with Farm Management,  
V. U.

In business terminology two types of Leverages are used—(i) Operating Leverage arising out of the fixed operating cost. It refers to the use of fixed costs in the operation of a firm. A firm has a high degree of operating leverage if it employs a greater amount of fixed costs and on the otherhands if the firm employs a small amount of fixed costs, then it has a low degree of operating leverage.

(ii) Financial Leverage arising out of the fixed financial charges. Both the leverages are related with the terms, Degree of operating risk and Degree of financing risk.

Operating Risk : This represents the variability in earnings before interest and Taxes ( EBIT ) due to the risks inherent in the operations of the firm. EBIT changes due to variability in sales. Variability in sales depends upon the nature of the firms, markets, the industry and the economy at large. Similarly variability in EBIT also depends on variability of operating costs of the

firm. A firm can not avoid the operating or business risk in its entirety because these factors are also amenable to changes due to changes in the conditions of the firm's markets or those of the industry or economy at large.

### FINANCIAL RISK :

The risk essentially refers to the use of debt capital in the capital structure of the firm. Since debt capital is usually cheaper than equity, the use of debt increases the rate of return on equity so long as the rate of return exceeds the cost of debt capital. Thus the use of debt capital has a magnifying effect on the rate of return to equity. Since the financial risk is associated with debt capital, if no debt capital is used in the capital structure of the firm, there is no financial risk.

### DISTINCTION BETWEEN OPERATING OR BUSINESS RISK & FINANCIAL RISK :

Operating risk is unavoidable and depends on the environment of the firm. Financial risk is avoidable and depends on the decision of the firm to use debt capital in the capital structure. Thus two firms of the same degree of operating risk may have to face different degree of financial risk due to use

of different proportion of debt and equity in the capital structure. Let us discuss below the operating leverage and financial leverage with its measures and implications in business environment.

As has been discussed earlier, the operating leverage is the ability of a firm to use, fixed operating costs to magnify the effects of changes in sales on operating profits ( EBIT ).

Thus the degree of operating leverage ( DOL ) can be discussed as follows.

$$DOL = \frac{\text{Percentage change of operating Profit}}{\text{Percentage change in sales Volume.}}$$

Alternatively,

$$DOL = \frac{Q(S - V)}{Q(S - V) - F} \text{ greater than one.}$$

Where : Q = No. of units sold  
 S = Unit selling price.  
 V = Unit variable costs.  
 F = Fixed Costs for the period.

DOL must be greater than Unity. The higher the degree of operating leverage the greater is the risk.

Degree of Financial Leverage (DFL) indicates the firm's ability to use fixed financial charges to magnify the effect of changes in EBIT on the firm's EPS ( Earning per share).

$$\text{DFL} = \frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}}$$

greater than Unity.

$$\text{Another formula of DFL} = \frac{\text{EBIT}}{\text{EBIT} - I}$$

$$= \frac{\text{EBIT}}{\text{EBT}} \text{ greater than one.}$$

(I=Interest)

(EBT = Earning before tax).

DFL must also be more than unity. The higher the degree of financial leverage, the greater is the financial risk associated and vice-versa.

### Comparison of Operating and Financial Leverage

Two Leverages are in fact interrelated. If a firm could reduce its degree of operating leverage, then it would probably increase the degree of financial leverage. So we may say, a firm having higher operating leverage should opt for a lower financial leverage. It should

be pointed out that determination of optimum level of operating and financial leverage is difficult. Operating leverage is called first stage leverage and financial leverage is called second stage leverage.

**Conclusion** :—Thus the total risk involved in a firm can not only be determined by operating and financial leverage.

The Degree of combined leverage (DCL) will be used full for measuring risk profile of the firm.

That is  $\text{DCL} = \text{DOL} \times \text{DFL}$ .

$$= \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{Contribution}}{\text{EBT}}$$

Utility of DCL lies in the fact that it signifies the effect that changes in sales will have an impact on EPS or EBT.

Four proposition of Operating and Financial Leverage and their combined impact on the firm may be outlined below.

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Proposition	Operating Leverage.	Financial Leverage	Effect on Combined leverage.
1)	High	High	This combination is very risky and high and should be avoided.
2)	Low	Low	Here the Management is concerned with debt financing and it should be avoided.
3)	High	Low	Full advantage of debt financing is not found.
4)	Low	High	Since operating leverage is low, full advantages of debt financing can be taken.

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