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Operating Leverage and Profitability : An Empirical Study of Select Public Sector Enterprises in India

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In this research article, an attempt has been made to explore the ideas embedded in the concept of operating leverage and profitability of firm. An endeavour has also been made to analyse the impact of operating leverage on profitability of the sampled PSEs under different industries during the period 1999-2000 to 2009-2010 by using the relevant financial data available in the published Annual Reports of the firms concerned. In such an analysis the relationship between operating leverage and profitability has been tried to establish with the application of different statistical tools and techniques. After the analysis of data from different angles some important findings have been extracted, which are the essence of this study for deriving the managerial implications in the way of policy formulation of the management of different firms, which are ultimately helpful to the economic well being of the country as a whole. The entire study has been divided into four sections besides the introductory part. Section-I deals with the theoretical framework of the variables concerned and Section-II covers the Literature Review, Objectives and Methodology. The analyses and findings are presented in Section-III and Section-IV explores the conclusion of the study.

Keywords : Operating Leverage, Profitabily, Bottom Line, Sales Elasticity, Return on Capital Employed, Sampled PSEs Regression Analysis, Correlation Analysis.

Introduction

It is now widely recognized that in the developing countries the trap of low per capita income can be removed by a bold intervention of the government in public sector enterprises (PSEs). The PSEs are regarded as powerful instruments for attaining the goal of socio-economic development of a country. In a mixed economy, like India, the efficient and effective implementation of socio-economic model of industrial policy leads to rapid economic growth and development. A large number of PSEs in India have been incurring losses due to their inefficient utilization of exist-ing productive capacity as well as the problems behind modernization of

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their transformation module to cope up with the changes that has already been taken place in the technological subsystem of the society. The judicious blending of fixed cost and variable cost in the cost structure of a firm through suitable substitution of capital for labour (which have already been excessively deployed) raising its fixed cost and simultaneously reducing the variable cost per unit ensures greater amount of profit with higher quantum of business risk in terms of enhancing degree of operating leverage at its disposal. Obviously, operating leverage has a great impact on profitability of a firm.

Section-1

Operating Leverage and Profitability : The Theoretical Framework

The concept of operating leverage is not a new one. It was originally developed for the purpose of taking capital budgeting decision. The mutually exclusive projects involving alternative methods of production may have different values of operating leverage which result in different Break-Even-Points (BEPs) with different degrees of risk. Operating leverage is highly dependent on the use of technology of the firms under an industry. Obviously, it is closely associated with how the fund has been invested (i.e. the investment decision of the firm) but not related with how the fund has been raised (i.e. financing

decision). So, it can be said that operating leverage is independent of the capital structure of a firm.

Meaning and Definition of Operating Leverage

The business enterprises having huge quantum of investment in technology (i.e. in fixed assets) are associated with the large amount of fixed operating costs, such as salaries, rent, depreciation, insurance, etc. in their cost structure which leads to high operating leve-rage for them. If the business firm substitutes capital for labour thereby raising its fixed cost, it will simultaneously reduce the variable cost per unit. The large amount of fixed cost coupled with the small proportion of variable cost to sales revenue ratio will have a great impact on Earnings Before Interests and Taxes (EBIT) even there is a slight change in sales revenue. It is argued that "if a high percentage of firm's total cost is fixed, the firm is said to have a high degree of operating leverage *(Brigham, 1971 : 426)*. Obviously, the firms having lower amount of fixed operating cost at their disposal are observing lower operating leverage. Therefore, if the ratio of fixed cost to total cost is very high and does not decline when demand falls, this will accelerate the firm's business risk. This factor is technically known as operating leverage. To this direction, it may be argued that the

firms will have some control over their operating leverage in the way of taking their capital budgeting decision.

Operating leverage may clearly be defined as the firm's state of being able to use fixed operating expenses to enlarge the effect of changes in sales revenue on its EBIT. Other factors remaining unaltered, a high operating leverage signifies that a relatively slight change in sales revenue brings about a big change in EBIT and the Return on Equity (ROE).

Schuttz and Shultz (1972) in their textbook argued that, "since a fixed expense is being compared to an amount which is a function of a fluctuating base (sales), Profit-and-loss-results will not bear a proportionate relationship to that base. These results, in fact, will be subject to magnification, the degree of which depends on the relative size of fixed costs vis-à-vis the potential range of sales volume. This entire subject is referred to as operating leverage.". The higher the proportion of fixed cost to total cost, the higher will be the operating leverage of the firm *(Archer and D'Ambrosio, 1972 : 421)*. One of the most dramatic examples of operating leverage is in the airline industry, where a large portion of total costs are fixed *(Van Horne, 1972 : 680)*.

It can alternatively be defined by the term Degree of Operating Leverage (DOL), which has been referred to the percentage change in operating income (EBIT) due to a given percentage change in units sold. It reveals how a given change in volume affects EBIT. Thus, it can be expressed as follows :

$$DOL =$$

$$= \frac{Percentage\ change\ in\ EBIT\ (i.e.\pi\ )}{Percentage\ change\ in\ units\ sold\ (i.e.,\ q)}$$

$$.....(1)$$

$$\Rightarrow DOL = \frac{\frac{\Delta EBIT}{EBIT} \times 100}{\frac{\Delta q}{q} \times 100} = \frac{\Delta EBIT \times q}{EBIT \times \Delta q}$$

$$\Rightarrow DOL = \frac{\Delta q(p-v) \times q}{[q(p-v)-f] \times \Delta q} = \frac{q(p-v)}{q(p-v)-f}$$

$$.....(1a)$$

Where, DOL = Degree of Operating Leverage

$EBIT$ = Earnings Before Interest & Taxes

f = Fixed operating cost during the period

p = Selling price per unit which is fixed in the short-run period

v = Variable cost per unit which is constant over the short-run period

It is an index which measures the effect of changes in sales revenue on EBIT *Buccino and McKinley (1997)*, in their research article, defined DOL as "the impact of a change in revenue on profit

or cash flow. It arises, whenever a firm can increase its revenues without a proportionate increase in operating expenses. Cost allocated to increasing revenue, such as marketing and business development expenditures, are quickly consumed by high fixed expenses." *Rushmore (1997)* in his article has pointed out that positive operating leverage occurs at the point at which revenue exceeds the total amount of fixed costs.

Higher operating leverage, caused by a greater proportion of fixed cost in the firm's cost structure, makes the EBIT series more volatile in relation to sales series. This basic relationship between EBIT and sales leads us to measure operating leverage as the percentage change in EBIT relative to percentage change in sales during a specified domain of time as shown below :

Degree of Operating Leverage (DOL) =

$$= \frac{\sum_{i=1}^{n} \left| \frac{\% \Delta EBIT}{\% \Delta q} \right|_i}{n}$$

where n = number of years,

(i=1, 2, 3,……n)

$$\Rightarrow DOL = \frac{\sum_{i=1}^{n} \left| \frac{\frac{\Delta EBIT}{EBIT} \times 100}{\frac{\Delta q}{q} \times 100} \right|_i}{n}$$

$$\Rightarrow DOL = \frac{\sum_{i=1}^{n} \left| \frac{\frac{\Delta q(p-v)}{q(p-v)-f} \times 100}{\frac{\Delta q}{q} \times 100} \right|_i}{n}$$

$$\Rightarrow DOL = \frac{\sum_{i=1}^{n} \left| \frac{q(p-v)}{q(p-v)-f} \right|_i}{n} \quad .....(2)$$

This equation (2) is practically used to determine average DOL of an enterprise over a period of time. We take the absolute value of the percentage change in two series because these two series can move in opposite directions. Here, the direction of change is not at all important but the relative size of change is relevant.

Operating Leverage Elasticity of Profits (OLEP)

From equation (1) we get,

$$DOL = \frac{\% \ change \ in \ EBIT \ (=\pi)}{\% \ change \ in \ Unit \ (q)}$$

$$\Rightarrow DOL = \frac{\frac{\Delta \pi}{\pi} \times 100}{\frac{\Delta q}{q} \times 100}$$

$$\Rightarrow DOL = \frac{\Delta \pi}{\Delta q} \times \frac{q}{\pi}$$

4

$$\Rightarrow DOL = \frac{\partial \pi}{\partial q} \times \frac{q}{\pi} \qquad \qquad .....(3)$$

$$\left[\frac{\Delta \pi}{\Delta q} \rightarrow \frac{\partial \pi}{\partial q} \text{ for a very small change in } q \right]$$

where,

π = Earnings Before Interest & Taxes (EBIT)

q = Output sold in units

Δπ = ∂π = Change in EBIT (π)

ΔQ = ∂q = Change in units sold (q)

DOL = Degree of Operating Leverage.

Since DOL is nothing but a ratio of two percentage changes, it can be regarded as the Operating Leverage Elasticity of Profits (OLEP). When the sales revenue curve and the cost curve are linear, this elasticity measure will vary depending on the specific portion of the break-even chart under consideration. For instance, when DOL is always very close to the Break-Even-Point (BEP), a very small change in sales volume can produce a very large percentage enhancement of profits, simply because the base line profit is closed to zero (0) near the BEP.

Impact of Fixed Cost on DOL

DOL depends upon the quantum of fixed operating cost of an enterprise. It can mathematically be shown as under : From equation 1(a), we get

$$DOL = \frac{\Delta q(p-v) \times q}{[q(p-v) - f] \times \Delta q} = \frac{q(p-v)}{q(p-v) - f}$$

$$DOL = \frac{Contribution(C)}{Contribution(C) - f} \qquad .....(4)$$

Financial Implications :

The financial implications of equation 1(a) are as follows :

i) If a firm has no fixed cost, i.e., *f* = 0, (and hence breaks even at zero), though it is not practically possible, its

$$DOL = \frac{q(p-v)}{q(p-v) - f} = 1, \text{ which means}$$

that there is no operating leverage of the firm and in that case, percentage increase in sales *(i.e. q)* yields the same percentage increase in operating income (i.e. EBIT) and also the firm's operating margin equals to its contribution margin. Symbolically, if the fixed cost (*f*) = 0, then :

$$q(p-v) = q(p-v) - f$$

$$\Rightarrow \frac{q(p-v) - f}{pq} = \frac{q(p-v)}{pq}$$

$$\Rightarrow \frac{q(p-v) - f}{pq} = \frac{p-v}{p} \qquad .....(5)$$

$\Rightarrow$ Operating Margin *(r%)* = Contribution Margin *(c%),*

DOL is highest near the BEP. In fact near BEP, $\pi[= q(p-v) - f]$ tends to 0 and hence,

$$DOL = \frac{q(p-v)}{q(p-v)-f} = \frac{q(p-v)}{0}$$

$= \propto$ (infinity), i.e., very large.

ii) If fixed cost (f) of the firm is greater than zero (0), i.e. $f > 0$, then

$$DOL = \frac{q(p-v)}{q(p-v)-f} > 1$$ and hence DOL exists and in that case, percentage increase in EBIT (π) is greater than that of sales. This means that if sale increases by 1 per cent, EBIT ($= \pi$) will increase by more than 1 per cent; and

iii) If Fixed cost (f)<0, which is not at all possible, there is no question of estimating DOL.

Thus, it may be concluded that DOL heavily depends on the fixed operating cost (f) of the firm.

Relation between DOL and Margin of Safety (M/S)

It can also be shown simply by a little manipulation of equation 1(a) that there is an inverse (i.e., reciprocal) relationship between DOL and Margin of safety (M/S) of a firm. This is as shown below :

$$DOL = \frac{q(p-v)}{q(p-v)-f}$$ [from equation 1(a)]

$$\Rightarrow DOL = \frac{pq}{pq - \frac{fp}{(p-v)}}$$

[Dividing numerator and denominator by $\frac{p}{p-v}$]

$$\Rightarrow DOL = \frac{pq}{pq - \frac{f}{\frac{p-v}{p}}}$$

$$\Rightarrow DOL = \frac{Sales}{Sales - BEP\ sales}$$

$$\Rightarrow DOL = \frac{1}{\frac{Sales - BEP\ Sales}{Sales}}$$

$$\Rightarrow DOL = \frac{1}{(M/S)} \qquad .....(6)$$

where M/S indicates Margin of Safety.

Thus, it may be concluded that there is an inverse relationship between DOL and M/S ratio. Moreover, at the lower level activity M/S is low, hence DOL is high and in that case a business firm has not got enough risk bearing capacity as measured by the volatility of sales. A low M/S is the result of high operating fixed costs, other factors remaining constant.

The Bottom Line

The "bottom line" for a business firm is defined as the rate of return on owners' equity.

Symbolically,

$$r = \frac{EBIT}{E} \qquad \text{.....(7)}$$

$$\Rightarrow r = \frac{q(p-v)-f}{E} \qquad \text{.....(7a)}$$

where EBIT = Earnings Before Interest & Taxes

E = Owners' Equity

r = Rate of Return on Owners' Equity.

It is realized that the most appropriate method of ascertaining operating leverage is to determine the quantum of EBIT at various levels of output sold (q).

The change in the value of r due to the increase in the level of output (q) is defined by –

$$\Delta r_t = (r_{t+1} - r_t) = \frac{q_{t+1}(p-v)-f}{E} - \frac{q_t(p-v)-f}{E}$$

$$\Rightarrow \Delta r_r = \frac{(q_{t+1}-q_t)(p-v)-f+f}{E}$$

$$\Rightarrow \Delta r_t = \frac{(q_{t+1}-q_t)(p-v)}{E} \qquad \text{.....(8)}$$

where r_t = Rate of return at period t,

r_{t+1} = Rate of return at period ($t+1$),

q_t = Output at period t

q_{t+1} = Output at period ($t+1$), and

E = Current market value of equity/stock

It is realized that in assessing the justification of their investment in stocks of a firm, its owners should use the current market value of the stock as because the market value is what the stockholder would have got to invest elsewhere if they dispose of their stocks.

The business firms have to change their level of output sold in order to enhance the rate of return enjoyed by their stockholders. This can be done either by increasing the sales in units or by reducing the units of production which cannot be sold out in the market without allowing certain percentage of discount in selling price. Here, it is assumed that any change in the level of output will have no impact on selling price, which is true in the real world for a small enterprise.

Now the value of r, after there is a change in the level of output, may be derived as follows :

$$r_{t+1} = \frac{r_t \pm (q_{t+1}-q_t)(p-v)}{E}$$

$$\Rightarrow r_{t+1} = \frac{q_t(p-v)-f+(q_{t+1}-q_t)(p-v)}{E} \quad \text{.....(9)}$$

(Assuring $q_{t+1} > q_t$)

Let us consider i = interest expenses of the firm on its debt fund in the capital structure; then

$$r_t = \frac{\{q_t(p-v)-f\}-i}{E} \quad\quad .....(10)$$

and

$$r_{t+1} = \frac{\{q_{t+1}(p-v)-f\}-i}{E} \quad\quad .....(11)$$

Therefore,

$$\Delta r_t = (r_{t+1}-r_t) = \frac{[\{q_{t+1}(p-v)-f\}-i]-[\{q_t(p-v)-f\}-i]}{E}$$

$$\Rightarrow \Delta r_t = (r_{t+1}-r_t) = \frac{(q_{t+1}-q_t)(p-v)}{E} \quad .....(12)$$

which means that the change in owners' rate of return resulting from a change in the level of output sold is independent of the interest expense incurred by the firm on its debt capital in the capital structure.

DOL and Sales Elasticity of Operating Profit – A Proof of the Relationship

DOL is closely related to the rate of increase in the return on owners' equity before interest and taxes (i.e. the operating profit margin) r. It can be proved that DOL in any period t is nothing but the sales elasticity of operating profit.

The rate of increase in r

$$= \frac{r_{t+1}-r_t}{r_t} = \frac{\Delta r_1}{r_t} = \frac{(q_{t+1}-q_t)(p-v)}{r_t E} \quad .....(13)$$

$$\left[\because \Delta r_t = \frac{(q_{t+1}-q_t)(p-v)}{E} \right]$$

$$\Rightarrow \frac{\Delta r_t}{r_t} = \frac{(q_{t+1}-q_t)(p-v)}{\dfrac{q_t(p-v)-f}{E} \times E} = \frac{(q_{t+1}-q_t)(p-v)}{q_t(p-v)-f}$$

$$\Rightarrow \frac{\Delta r_t}{r_t} = \frac{\left(\dfrac{q_{t+1}-q_t}{q_t}\right)}{\dfrac{q_t(p-v)-f}{q_t(p-v)}} = \left(\frac{q_{t+1}-q_t}{q_t}\right) \times \frac{q_t(p-v)}{q_t(p-v)-f}$$

$$\Rightarrow \frac{\Delta r_t}{r_t} = \frac{\Delta q_t}{q_t} \times DOL_t$$

$$\Rightarrow DOL_t = \frac{\Delta r_t / r_t}{\Delta q_t / q_t} = \frac{(\Delta r_t / r_t) \times 100}{(\Delta q_t / q_t) \times 100}$$

$$\Rightarrow DOL_t = \frac{\Delta r_t}{r_t} \times \frac{q_t}{\Delta q_t}$$

$$\Rightarrow DOL_t = \frac{\Delta r_t}{\Delta q_t} \times \frac{q_t}{r_t}$$

$$\Rightarrow DOL_t = \frac{dr_t}{dq_t} \times \frac{q_t}{r_t} \quad\quad .....(14)$$

$$\left[where \ \frac{\Delta r_t}{\Delta q_t} \to \frac{dr_t}{dq_t} \ for \ a \ very \ small \ change \ in \ q_t \right]$$

Thus, we can say that DOL is nothing but the sales elasticity of operating profit in any period t of a firm.

Meaning and Definition of Profitability

The profitability of a business enterprise for a specified period of time can be visualized as the final outcome of its

investing and operating activities. It is a relation measure of financial efficiency of business. A good profitability always brings a socially desirable performance of those business enterprises who have sufficient capital to invest irrespective of their ownership status – either private or public sector. It plays an important role in guiding and directing the business enterprises of a mixed economy. Growth and survival stability of an enterprise greatly depend on its profitability. This profitability in its adequate shape can meet the real and potential human wants in a new and more efficient ways. It may be defined as the ability to earn profits (i.e., excess of income over expenditure) by an enterprise either on its static resources, i.e., invested capital or on its volume of sales revenue. Thus, it expresses the relationship between either 'profits and capital' or between 'profits and sales'. Actually it acts as a yardstick to measure the operating efficiency of the firm. The greater the profitability the more will be the operating efficiency and vice-versa. On the basis of earning power and operational strength profitability may be defined as the "ability of a given financial instrument/item to earn a return from its use *(Howard & Upton, 1953)*. It may be defined as "the net surplus of a large number of policies and decisions" *(Weston & Brigham, 1976)*. It also refers to "the relationship of income to some balance sheet measures

which indicates relative ability to earn income on assets employed. It reveals how efficiently the management of an enterprise can generate profits by using the resources available at its disposal. Though it is an important yardstick for measuring efficiency, the profitability is not synonymous to the term efficiency. Actually it is the index of efficiency that may be regarded as management guide in the way of achieving better performance. The change in operational efficiency is merely one of the important factors on which profitability of an enterprise largely depends. Moreover, there are many other factors, besides efficiency, which affect the profitability of a firm.

Profit and profitability, in real sense, though in some cases used interchangeably, are two different concepts—the former is the absolute term and the later is the relative one. However, they are closely related, mutually interdependent and interacting to each other, having distinct role in business. Profit refers to the amount of income earned by the enterprise during the specified domain of time, while profitability refers to the ability of a business firm to earn profits on sales/investment that can be regarded as a test of efficiency and a measure of control. Two business firms, in terms of profits may be identical but on the basis of their profitability those may be different based on differences in their sales/investment.

Being an absolute figure profit is not in a position to give an exact idea of the adequacy of income of a firm. It also fails to identify the changes in efficiency of the firm during a specified time period. Due to the variation in size of investment, volume of sales, etc. much difficulty arises in the way of interpreting absolute figure of profit for the purpose of both horizontal and vertical analysis. The problem of such analysis and interpretation is solved by taking the ratio of either profit to investment or profit to sales or both. This profitability is measured on the basis of some financial ratios. For the purpose of this study following are the three widely used ratios for measuring profitability.

i) Return on Capital Employed Ratio (ROCE)

This ratio expresses the relationship between operating profit before interest and taxes (EBIT) and the amount of permanent funds invested in the enterprise. It is considered as the rigorous test of profitability and gives a clear picture of the efficiency of the firm's internal management. It enables the management to show whether the funds entrusted to the enterprise have been properly utilized or not. It also indicates how well an enterprise has used long term funds invested by the owners and creditors. The higher the ratio, the more efficient the enterprise

is using its fund. The ROCE can be calculated by using different concepts of profit and capital employed. However, for the the purpose of our study, the following formula is utilized :

Return on Capital Employed =

$$= \frac{\text{EBIT}}{\text{Capital Employed}} \times 100$$

Operating Profit Ratio (OPR) :

It expresses the relationship between net profit and sales, i.e.,

Operating Profit Ratio (OPR) =

$$= \frac{\text{Net Profit}}{Sales} \times 100$$

This is an indicator to the firm as to the amount of sales that is left after meeting production expenses, charges and all other costs associated with it at a reasonable level of risk and uncertainty. The high OPR ensures good return to the owners and enables a company to maintain its survival stability in adverse economic conditions. A company with a low net profit margin may earn a high rate of return on its investment if it has a high inventory turnover. This ratio is very significant to the firm for the purpose of controlling cost and promoting sales and, thereby, guides the effectiveness or otherwise of the firm. This ratio essentially expresses the cost price effectiveness of the operation.

Return on Total Asset Ratio (ROTAR)

This ratio measures the company's earnings before interest and taxes (EBIT) against its total net assets. The ratio is considered an indicator of how effectively a company is using its assets to generate earnings before the payment of contractual obligations.

ROTAR, one of the categories of Return on Investment (ROI), is computed as follows :

Return on Total Asset Ratio (ROTAR) =

$$= \frac{EBIT}{Net\ Assets} \times 100$$

It is also called profit to asset ratio and is calculated to derive the productivity of TAs. There are many variations of ROA depending upon the definition of net profits and assets and according to the need, intent and purpose of calculation.

SECTION-II

Review of Related Literature

Mandelker and Rhee (1984) in their research study demonstrated how the degree of operating leverage and financial leverage contribute to systematic risk of common stocks by analyzing the inter relationship amongst them. Though the study on 255 manufacturing firms during 1975-76, they concluded that the degree of operating as well as financial leverage explain a large portion of the variation in beta (β).

Pandey (1985) carried a study on 743 companies classified into 18 industrial groups for the period 1973-74 to 1980-81 and examined the relationship between leverage on the one hand and size, industry, profitability and growth on the other. From the survey of the company managers' attitude towards high degree of leverage, he observed that one of the most motivating factors for employing outside debt was to increase return for shareholders. But the study failed to indicate a definite structural relationship between the degree of leverage and profitability. According to Pandey, although over the periods, both the profitability and the degree of leverage had improved significantly, yet majority of the profitability groups was concentrated within narrow bands of leverage.

Mseddi and Abid (2004) investigated the linkage between company value and risk. They used panel data to calculate DOL and DFL of 403 non-financial USA firms for the years 1995 to 1999. They found a significant positive impact on company value of both operating and financial leverage. They also proved that the excess return is a positive and increasing function of DOL. DFL and systematic risk for sample firms that show a positive correlation of sales changes with market portfolio returns.

Watson and Head (2010), in their research article have argued that the degree of operating leverage provides an explanation to the extent to which an enterprise relies on fixed operating costs in its quest for maximizing its operating profit. In this study it is clarified that an enhancement of profits as a result of controlling the fixed operating cost of the enterprise is such that the total revenue covers a higher margin than the fixed cost of the product. Conversely, it is observed that the continuous increase in operating leverage signifies an equal percentage increase in fixed operating costs of the firm that has the propensity to decrease the margin of operating profit of the enterprise in the long run.

Chandrakumarmangalam and Gobindasamy (2010) conducted a research study, taking financial records of seven selected cement companies of India over a period of eleven years (1997-2007), in which they tried to analyse and examine statistically the impact of leverage on profitability of the firms. The study aims to describe how the earning capacity of firms is influenced by fixed operating cost and fixed financial charges. The study also explains the relationship between Debt-Equity ratio and Earnings Per Share. The results of the study indicate that there is a significant relationship between leverage and profitability and growth and this leverage has a considerable impact on profitability of the firms under consideration.

Achchuthan and Jasinthan (2012) have conducted a study in which they have investigated the influence of financial and operating leverage on financial performance with special reference to Lanka Orix leasing company Plc in Sri Lanka. In this study, an attempt has been made to examine the impact of operating leverage on financial performance of the firm under study during the year 2001-2010, taking financial performance as dependent variable and financial and operating leverages as independent variables. Collected data have been analysed with the help of different financial and statistical tools and techniques. From the study it is found that operating leverage has a significant impact on financial performance of LOLC Plc in Srilanka. It is also revealed that there is no significant relation between financial leverage and performance of the company.

Tayyaba K (2013) have conducted a research study in which she has tried to understand the effect of the degree of financial as well as operating leverage on profitability of oil and gas sector. The study shows the relationship between leverage and EPS of this sector. It analyses how earning capacity is affected by operating cost and fixed financial charges. It also shows the relationship

between D/E ratio and EPS. In this study, financial data are collected from the Annual Reports of 25 sampled companies during the period 2007 to 2012. These data have been analysed with the help of financial and statistical tools and techniques. Different hypotheses have been tested at 1 per cent level. From the study it is found that there is a positive relationship between DFL and EPS and a negative relationship between DOL and EPS. It is also found that the leveraged companies are relatively more riskier with reference to ROE and ROI.

John Gartchie Gatsi, Samuel Gameli Gadzo and Richard Kofi Akoto (2013) have conducted a research study in which they have investigated how profitability of insurance firms in Ghana, is influenced by working capital management and leverage using relevant financial data of eighteen firms collected from database of the National Insurance Commission and Ghana Statistical Service on Insurance sector. One of the important findings in this study was that the degree of financial leverage and liquidity are inversely related to profitability while operating leverage is directly related to profitability.

Objectives of the Study

The main objective of the study is to measure the relationship between operating leverage and profitability of select public sector enterprises in India

over a period of 11 years (i.e. from 1999-2000 to 2009-2010). Specific objectives of the study are as follows :

i) To give an insight into the concept of operating leverage and profitability of a firm.

ii) To evaluate the intensity of relationship between the degree of operating leverage and profitability measured in terms of different profitability ratios.

iii) To assess the degree of association and the impact of operating leverage on profitability of the firms under study by using the Pearsonian product moment correlation coefficients and also regression analysis.

iv) To test the significance of the correlation coefficient and the regression parameters at both 5 per cent and 10 per cent level, using two tailed tests.

Methodology of the Study

The present study adopts the analytical as well as descriptive research design. The study is based on secondary sources of information. The data of twenty sampled firms under four industries has been collected from the annual reports and balance sheets published by the respective companies and also from the websites of the companies. The firms were included in the sample by using

the stratified random sampling method, when each stratum is considered as a separate industry. The variables used in this analysis are Degree of Operating Leverage (DOL), Earning Before Interest and Taxes (EBIT), Return on Capital Employed (ROCE), Operating Profit Ratio (OPR), Return on Total Assets Ratio (ROTAR). The study has been conducted during 1999-2000 to 2009-2010. Various statistical tools, such as, Mean, Standard Deviation, Coefficient of Variation, Correlation, Regression etc. have been used for the analyses of data. The SPSS software has been used to analyse the data, also to determine statistical significance of the relationship, if any, among the variables under study and also to test different hypotheses developed here. For better understanding of the effect of operating leverage on the profitability, the following hypotheses have been developed :

i) Null Hypothesis (H_0) : there is no significance relationship between DOL and profitability (in its all three measures) of the firms under study.

ii) Alternative Hypothesis (H_1) : there is a significant relationship between DOL and any of the three measures of profitability of the firms under study. The following three regression models have been estimated to test these hypotheses :

$$Model\ 1 : OPR_i = \beta_0' + \beta_1' DOL_i + u_i$$

$$Model\ 2 : ROCE_i = \beta_0'' + \beta_1'' DOL_i + \epsilon_i$$

$$Model\ 3 : ROTAR_i = \beta_0''' + \beta_1''' DOL_i + v_i$$

Here variables are as defined earlier and u_i, ϵ_i and v_i are white noise disturbance terms having zero mean and constant variance each.

Section – III

Data Analysis and Results

The computed values of degree of operating leverage (DOL) of each sample company under four different sectors over the study period are presented in Table-1 to Table-4. In general, DOL figures are found to be highest for the select companies under steel sector and those figures are lowest for the select companies under power sector, which are evident from the mean values of DOL figures over the years for each of the particular companies. Further, from these four Tables we see that there remains wide variation in DOL for most of the companies over the years under steel industry and that variation is lowest for the companies over the years under petroleum sector (as observed from the computed values of coefficient of variation). From Table-1 to Table-4, it is further observed that across different selected companies, dispersion in

DOL varies over the year. For instance, coefficient of variation in DOL is found very large in the last three years of our study period, compared to earlier years for the companies of petroleum sector. The reverse situation is observed for the companies under coal industry and steel industry where initially values of C.V. were lower than those in the later years. But for the companies under power sector we see more or less unchanged but high values of C.V. during the study period. Again from Table-1 to Table-4 we see that there remains wide variation in values of DOL over sample companies within the same industry. For instance, taking all the years under study together the mean value of DOL is found to be much lower for 3 companies (CPCL, IOCL and ONGC) in petroleum sector, 1 company (NCL) in coal sector, 2 companies (NHPCL and NHDCL) in

Table-1 : DOL of Selected Companies under Petroleum Sector for the Period between 1999-2000 and 2009-2010

DOL of Year	BPCL	CPCL	HPCL	IOCL	ONGC	Industry		
						Mean	S.D.	C.V. (%)
1999-2000	2.875	1.888	2.276	2.276	2.080	2.28	0.37	16.23
2000-2001	3.256	2.457	2.744	2.347	1.470	2.45	0.65	26.53
2001-2002	2.338	2.791	2.829	1.770	1.300	2.21	0.66	29.86
2002-2003	2.073	1.345	1.954	1.247	1.140	1.155	0.43	27.74
2003-2004	1.827	1.412	1.803	1.217	1.380	1.53	0.27	17.65
2004-2005	4.141	1.392	3.656	2.186	1.371	2.55	1.29	50.59
2005-2006	3.246	2.758	3.583	2.461	1.25	2.66	0.90	33.83
2006-2007	3.093	2.651	3.762	2.119	1.37	2.60	0.91	35.00
2007-2008	3.770	1.625	5.321	2.054	1.38	2.83	1.68	59.36
2008-2009	4.176	1.677	5.796	2.004	1.39	3.01	1.91	63.45
2009-2010	4.518	1.753	6.268	2.118	1.39	3.21	2.10	65.42
Mean	3.21	1.98	3.63	1.98	1.41	2.44	—	—
S.D.	0.89	0.57	1.55	0.41	0.23	—	1.19	—
C.V. (%)	27.72	28.79	42.69	20.70	16.31	—	—	48.77

Source : Author's own calculations based on the data from published Annual Reports of selected companies under four sectors and also from the websites of the companies.

Table-2 : DOL of Selected Companies under Coal Sector for the Period between 1999-2000 and 2009-2010

DOL of Year	CCL	ECL	NCL	WCL	SECL	Industry		
						Mean	S.D.	C.V. (%)
1999-2000	6.10	4.32	1.56	4.19	4.82	4.20	1.66	39.52
2000-2001	4.90	3.92	1.55	5.93	5.86	4.43	1.81	40.86
2001-2002	5.25	2.89	1.17	7.10	3.77	4.04	2.26	55.94
2002-2003	5.74	4.89	1.54	5.98	4.50	4.53	1.77	39.07
2003-2004	6.70	7.13	1.57	4.06	3.01	4.49	2.38	53.01
2004-2005	6.40	7.00	1.56	4.47	3.11	4.51	2.26	50.11
2005-2006	2.55	8.75	1.47	2.31	4.59	3.93	2.93	74.55
2006-2007	3.01	4.31	1.45	3.51	2.59	2.97	1.06	35.69
2007-2008	3.57	4.24	0.97	5.15	3.17	3.42	1.56	45.61
2008-2009	3.61	4.23	1.08	5.12	3.23	3.45	1.51	43.77
2009-2010	3.66	4.25	1.06	5.24	3.32	3.51	1.55	44.16
Mean	4.68	5.08	1.36	4.82	3.82	3.95	—	—
S.D.	1.46	1.76	0.24	1.31	0.99	—	1.84	—
C.V. (%)	31.19	34.65	17.65	27.18	25.92	—	—	46.58

Source : Author's own calculations based on the data from published Annual Reports of selected companies under four sectors and also from the websites of the companies.

power sector and 3 companies (RINL, SIIL and SAIL) in steel sector compared to their sample counterparts. Therefore, it may be concluded that there is wide variation in DOL for the companies across different sectors over time in regard to both mean levels and instabilities (measured by C.V.s).

After year-wise computation of DOL for the companies across sectors, next, we have computed Pearson's product moment correlation coefficient between DOL and each of the measures of profitability (namely, OPR, ROCE, ROTAR) for each select company using time series data from 1999-2000 to 2009-2010 and the results are presented in Table-5. From Table-5 we see that out of total sixty (60) computed correlation coefficient thirty-five (35) coefficients are significantly different from

Table-3 : DOL of Selected Companies under Power Sector for the Period between 1999-2000 and 2009-2010

DOL of Year	NHPCL	NTPC	NEEPCL	NPCIL	NHDCL	Industry		
						Mean	S.D.	C.V. (%)
1999-2000	0.26	2.49	1.28	5.23	—	2.32	2.15	92.67
2000-2001	0.22	2.69	0.45	1.47	—	1.21	1.13	93.38
2001-2002	0.28	2.88	1.02	1.12	—	1.33	1.10	82.71
2002-2003	0.25	2.95	6.04	1.34	—	2.65	2.52	95.09
2003-2004	0.29	1.03	1.21	0.91	0.34	0.76	0.42	55.26
2004-2005	0.30	1.91	0.86	0.58	0.57	0.79	0.69	87.34
2005-2006	0.45	2.45	1.11	0.76	0.41	1.04	0.84	80.77
2006-2007	0.32	2.11	1.58	1.19	0.16	1.07	0.83	77.57
2007-2008	0.27	2.04	1.70	1.02	0.17	1.04	0.83	79.80
2008-2009	0.32	2.02	1.72	1.06	0.16	1.06	0.82	77.35
2009-2010	0.38	2.00	1.77	1.12	0.17	1.09	0.81	74.31
Mean	0.28	2.23	1.70	1.44	0.28	1.19	—	—
S.D.	0.11	0.54	1.50	1.28	0.16	—	1.1969	—
C.V. (%)	39.28	24.22	88.23	88.89	57.14	—	—	100.59

Source : Author's own calculations based on the data from published Annual Reports of selected companies under four sectors and also from the websites of the companies.

Table-4 : DOL of Selected Companies under Steel Sector for the Period between 1999-2000 and 2009-2010

DOL of Year	MEL	MDNL	RINL	SIIL	SAIL	Industry		
						Mean	S.D.	C.V. (%)
1999-2000	24.09	44.09	17.55	3.13	13.73	20.52	15.21	74.12
2000-2001	20.70	36.23	18.09	3.33	10.14	17.70	12.41	70.11
2001-2002	26.77	24.16	17.95	6.51	10.93	17.26	8.58	49.71
2002-2003	25.98	20.79	6.19	5.81	11.81	14.12	8.98	63.59

(Contd....)

2003-2004	15.15	15.25	2.98	2.23	5.85	8.29	6.45	77.80
2004-2005	2.88	10.27	2.61	9.93	3.22	5.78	3.95	68.34
2005-2006	6.65	7.36	3.43	8.18	4.32	5.99	2.03	33.89
2006-2007	9.31	4.36	3.04	9.01	3.06	5.76	3.15	4.69
2007-2008	6.08	3.69	2.45	5.67	2.93	4.16	1.63	39.18
2008-2009	5.45	3.17	1.50	6.58	2.98	3.94	2.04	51.78
2009-2010	4.31	2.95	0.98	6.62	2.41	3.47	2.14	61.67
Mean	13.40	15.67	6.98	6.09	6.49	9.73	—	—
S.D.	9.37	14.20	7.11	2.44	4.28	—	9.154	—
C.V. (%)	69.92	90.62	101.86	40.06	65.95	—	—	94.08

Source : Author's own calculations based on the data from published Annual Reports of selected companies under four sectors and also from the websites of the companies.

zero at either 5 per cent or 10 per cent level of significance. Significant correlation coefficient between DOL and any measure of profitability is found to be highest in number for companies under steel and power sectors (10 each) and lowest in number for companies under coal industry (7 in number). Further, except in one case (NEEPCL in power sector) all these statistically significant correlation coefficient are found to be positive implying thereby that there is statistically positive relation between measure of profitability and DOL in a good number of cases. Further, our statistical analysis unhesitantly exclude the situation of negative relation between DOL and any of the three measures of profitability. Again the number of statistically significant

correlation is found to be highest when it is measured between DOL and OPR (15 in number) but for other two measures of profitability we get the same quantities of significant correlation coefficient.

Apart from the computation of correlation coefficient we have also made regression analysis in which we have enquired whether profitability depends on DOL of the companies. Taking three different measures of profitability separately as explained variable and DOL as explanatory variable we have run the regression equations and the estimated regression results along with R^2 and F-values are presented in Table-6. From Table-6 we see that out of sixty (60) sample cases exactly in thirty (30) cases any of the measures of profitability

Table-5 : Correlation Analysis between DOL and measures of Profitability of Selected Companies under Indian Public Sector between 1999-2000 and 2009-10

Selected Sector / Companies		Pearson's Correlation Coefficient between		
		DOL & OPR	DOL & ROCE	DOL & ROTER
Steel Sector	MEL	0.467	0.478	0.487
	MDNL	0.524**	0.174	0.126
	RINL	0.578*	0.604*	0.435**
	SIIL	0.781*	0.678*	0.659*
	SAIL	0.573*	0.587*	0.546*
Power Sector	NHPCL	0.601*	0.454**	0.339
	NTPCL	0.654**	0.657**	0.678**
	NEEPCL	-0.324*	-0.389	-0.398
	NPCIL	0.582*	0.419	0.412
	NHDCL	0.659*	0.674*	0.645*
Coal Sector	CCL	0.699*	0.771*	0.713*
	ECL	0.431	0.338	0.345
	NCL	0.347	0.421	0.391
	WCL	0.783*	0.697*	0.714*
	SECL	0.517**	0.345	0.346
Petroleum Sector	BPCL	0.524**	0.426	0.445**
	CPCL	0.416	0.417	0.410
	HPCL	0.561**	0.558**	0.557**
	IOCL	0.532**	0.597*	0.592*
	ONGCL	0.468	0.478	0.459

Source : Computed and compiled from the data published in Annual Reports of selected companies & their websites.

Note : *Statistically significant at 5 per cent level and **Statistically significant at 10 per cent level.

Table-6 : Regression Analysis on Selected Companies of the Indian Public Sector

(Regression Equation of Profitability on DOL

i.e. $OPR_i = \beta_0' + \beta_1'.DOL + u_i$, $ROCE_i = \beta_0'' + \beta_1'' + \in_i .DOL$ &

$ROTAR_i = \beta_0''' + \beta_1'''.DOL + v_i$)

Selected Companies	Measures of Profitability	Intercept Term ($\hat{\beta}_0$)	Regression Coefficients($\hat{\beta}_1$)	R^2	F-value
MEL	OPR	0.123	0.052	0.234	4.321
	ROCE	0.031	0.067	0.342	3.765
	ROTAR	0.003	0.010	0.540	2.134
MDNL	OPR	0.091	0.004**	0.282	4.334**
	ROCE	0.185	0.002	0.030	0.275
	ROTAR	0.145	0.009	0.020	0.142
RINL	OPR	0.008	0.020**	0.341	5.981**
	ROCE	0.125	0.020*	0.376	5.112*
	ROTAR	0.116	0.013*	0.387	5.065*
SIIL	OPR	0.092	0.013*	0.361	4.998*
	ROCE	0.011	0.009*	0.208	3.071*
	ROTAR	0.058	0.004	0.182	1.105
SAIL	OPR	0.045	0.002*	0.487	5.595*
	ROCE	0.043	0.034*	0.789	6.340*
	ROTAR	0.091	0.063*	0.505	7.114*
NHPCL	OPR	0.082	0.011*	0.361	4.398*
	ROCE	0.099	0.009	0.208	2.071
	ROTAR	0.058	0.004	0.112	1.105
NTPCL	OPR	0.101	0.006*	0.297	2.978*
	ROCE	0.189	0.002*	0.232	3.324*
	ROTAR	0.171	0.009*	0.199	2.014*

(Contd....)

NEEPCL	OPR	0.078	-0.002	0.106	1.036
	ROCE	0.149	-0.002	0.158	1.676
	ROTAR	0.124	-0.002	0.156	1.649
NPCIL	OPR	0.141	0.005**	0.341	4.479**
	ROCE	0.156	0.006	0.186	1.908
	ROTAR	0.147	0.006	0.172	1.907
NHDCL	OPR	0.069	0.013**	2.287	3.533**
	ROCE	0.212	0.019*	0.386	3.908*
	ROTAR	0.192	0.007*	0.347	5.787*
CCL	OPR	0.045	0.002*	0.487	7.595*
	ROCE	0.023	0.034*	0.589	8.340*
	ROTAR	0.081	0.003*	0.504	8.114*
ECL	OPR	0.081	0.002	0.191	2.038
	ROCE	0.163	0.001	0.112	1.131
	ROTAR	0.152	0.008	0.120	1.214
NEL	OPR	0.082	0.007	0.120	1.206
	ROCE	0.176	0.002	0.187	1.992
	ROTAR	0.171	0.002	0.152	1.619
WCL	OPR	0.007	0.011*	0.608	12.455*
	ROCE	0.069	0.008*	0.487	7.358*
	ROTAR	0.049	0.007*	0.512	8.456*
SECL	OPR	0.047	0.009**	0.265	3.324**
	ROCE	0.084	0.002	0.117	1.183
	ROTAR	0.081	0.003	0.121	1.219
BPCL	OPR	0.101	0.006	0.297	2.978
	ROCE	0.189	0.002	0.232	3.324
	ROTAR	0.171	0.009	0.199	2.014

(Contd....)

CPCL	OPR	0.229	0.003	0.182	1.879
	ROCE	0.152	0.011	0.172	1.851
	ROTAR	0.131	0.008	0.165	1.740
HPCL	OPR	-0.001	0.002**	0.415	4.115**
	ROCE	0.024	0.022**	0.309	3.994**
	ROTAR	0.015	0.003**	0.318	4.187**
IOCL	OPR	0.069	0.003**	2.287	3.533**
	ROCE	0.212	0.009*	0.356	4.908*
	ROTAR	0.192	0.007*	0.347	4.787*
ONGC	OPR	0.091	0.012	0.291	4.038
	ROCE	0.183	0.011	0.212	1.431
	ROTAR	0.152	0.008	0.120	1.214

Source : Computed and compiled from the data published in Annual Reports of selected companies and their websites.

Note : *Statistically significant at 5 per cent level and **Statistically significant at 10 per cent level.

positively depends on DOL and in no case we get negatively significant relationship between any measure of profitability and DOL. Further we do not get any industry or sector specific pattern of dependence of profitability on DOL of the sample companies. For each industry/sector we have estimated 15 regression equations (taking each of 3 measures of profitability as explained variable and DOL as explanatory variable for each of 5 sample companies in an industry). For the sample companies under steel industry, power sector, coal industry and petroleum industry we get statistically significant slope parameter in 9, 8, 7 and 6 cases respectively; consequently, their insignificant slope coefficients are in numbers 6, 7, 8 and 9 respectively. Further, it is to be noted here that we get exactly 50 per cent cases where profitability does not significantly depends on DOL, contradicting established theories in financial literature. An interesting observation that we get from our empirical study is that profitability is, in general, independent of DOL when the level of DOL is relatively low (e.g. for the sample companies in petroleum sector) and we get significantly positive relation between them (i.e., more risk leading to more return) when DOL value is comparatively high (e.g. for the sample companies under steel industry).

Section-IV

Concluding Remarks

From the estimated values of DOL across sample companies over the years under study for all the selected industry we do not get any specific pattern, rather there remains wide variation across both rows and columns implying that sample companies are heterogeneous in regard to their business risk. Again that risk for each company does not remain same over the study period.

There is well known hypotheses in financial literature that there is positive relationship between risk and return. That means more risk generates usually more return. DOL is widely used as a measure of business risk. Consequently if DOL increases the profitability of the company should also increase. In this empirical study, it has been observed that this positive relation between DOL and profitability (both from the measures of correlation coefficients and estimated regression equations) in sizable cases, especially when degree of business risk is found to be high. At the same time we have found no relation between these two factors in a number of cases, (where degree of business risk is low), which signifies that there remains some other factors here (like price risk, credit risk, market risk etc.) that significantly may affect the operating profit of the companies where profitability does not solely depend on DOL. The detailed investigation of these factors using more sample companies/industries for a longer study period and sub-periods opens up the new vista of future research.

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Ownership and Efficiency of Indian General Insurance Companies : A Bilateral Comparison Model of Performance

Ram Pratap Sinha*

The present study makes efficiency evaluation of the Indian private and public sector general insurance companies by considering them as two distinct groups. By departing from the extant efficiency literature on Indian general insurance industry, we have compared the two groups of insurance companies in terms of a bilateral comparison of performance in which the efficiency performance of one group is evaluated in terms of the reference set constructed from the data of the other group and vice versa. On the basis of the available efficiency scores are then used to compare the distribution of efficiency in terms of rank-sum test. The results clearly indicate that during the period of observation (2011-12 to 2015-16), the private sector group has outcompeted the public sector group. Finally, the econometric relationship between efficiency and insurer solvency is estimated using censored regression and the result is found to be statistically significant.

Introduction

The general insurance industry provides protection to individuals and businesses from many forms of unforeseen events like fire, theft, health related ailments, legal liabilities, natural calamity etc. Thus the industry offers insurance contracts which aim to protect property-liability, health etc. but do not come under the purview of life insurance. Needless to mention, in a modern society, the general sector plays an important role in promoting economic agents from unanticipated losses.

In the Indian context, the general insurance industry came in to existence during the British rule in the mid-nineteenth century. Till the nationalisation of the industry in 1973, it was dominated by the private sector. After nationalisation, the industry remained within the ambit of the public sector for nearly three decades. However, the deregulation of the insurance sector in 1999 led to the re-entry of private

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sector players in the general industry. During the past 18 years, the industry experienced considerable changes in market structure, conduct and performance. Against this backdrop, the present study seeks to make a comparative evaluation of efficiency performance of private and public general insurance companies operating in India and also explore the impact of solvency on such performance in terms of a three stage approach. In the first stage, technical efficiency of the observed general insurance companies is computed using a non-parametric framework with cross-benchmarking. In the second stage, rank-sum statistics method is used to check the two groups of general insurers have similar distribution of efficiency scores or not. In the final stage, the linkage between efficiency and solvency is explored in terms of censored regression. The paper proceeds in the following manner. Section-1 provides an overview of the general insurance sector. Section-2 describes the related research work. Section-3 outlines the methodology involved in the two stage analysis. Section-4 describes the results and Section-5 concludes.

Indian General Insurance Sector

Trends in Industry Growth

During the last five decades, the general market in India has come a full circle.

In the early seventies, the market was dominated by the private sector players. Following nationalisation of general business, the market remained public sector monopoly for the quarter of a century. Then the marketagain has become competitive. This was made possible due to the deregulation of entry and the establishment of the Insurance Regulatory and Development Authority in 1999. At this time (1999), general insurance penetration (as measured by premiums as a percentage of GDP) was only 0.54 and general insurance density (as measured by premiums per capita in USD) was 2.4. Gross direct premium income of the general insurance sector during 2000-01 was ₹9,807 crores.

At the time of policy reversal (relating to the role of private sector players) in the Indian insurance sector, there were only four public sector general insurance companies in the market. Between 2000-01 and 2015-16, 23 private sector general insurance companies entered the market. During the period, the general sector had an impressive growth in terms of both scale and scope. Table-1 provides an overview of the growth in Indian general insurance industry for the period 2011-12 to 2015-16. In the Table, 2012 stands for 2011-12, 2013 for 2012-13 and so on.

Table-1 : The Indian General Insurance Industry

Particulars	2012	2013	2014	2015	2016
Gross Direct Premium (₹ crores)	52875.77	62972.81	72990.36	80106.58	90338.31
Number of New Policies Issued (in Lakhs)	857.44	1070.24	1024.52	1257.61	1525.33
Paid Up Capital ((₹ crores)	5411	6575	6826	7622	8316
Number of Offices	7050	8099	9,872	10407	10283
Incurred Claims Ratio	88.90	82.79	81.74	85.06	90.91
Asset Under Management (₹ crores)	99268	122991	139809	160714	174818
Insurance Penetration	0.78	0.8	0.7	0.72	0.77
Insurance Density	10.5	11	11	11.5	13.2

Source : IRDA Annual Reports 2011-12 to 2015-16.

Regulation of the Industry

Indian insurance industry was nationalised in order to protect the consumers from unethical practices adopted by some of the then existing private sector insurers. However, after the nationalisation of the industry it was gradually seen that the public sector players were being rather insensitive to customer needs and also lagged in respect of adoption of new technical skills. The Committee on Reforms in the Insurance Sector, therefore, recommended private sector entry for infusing competition and providing greater choice to the consumers.

At the same time, the Committee recommended the establishment of a regulatory body for the insurance market which would frame prudential regulations for the insurance market participants and would monitor their conduct of business. This led to the establishment of Insurance Regulatory and Development Authority (IRDA).

After assuming charge of the insurance sector as the market regulator, the IRDA took several measures conducive to the broadening and strengthening of the market. In the context of the general sector these included Third Party Administration Regulations (2001), Insurance Broker and Corporate Regulations (2002), detariffication of prices (2007) and the Scheme of Amalgamation and Transfer of General

Insurance Business (2011). The Authority also issued several regulations relating to the registration of insurers, conduct of business, maintenance of solvency margins, code of conduct for the intermediaries etc.

An important regulation concerning the financial health of insurers is the regulation of solvency. In 2000, the IRDA issued assets, liabilities, and solvency margin of insurers regulations. The regulations stipulated that every insurer will have to determine the required and available solvency margins and the solvency ratio (the ratio of available and required solvency margins). The regulations were tightened further in 2016 and the control level of solvency was specified as a minimum solvency ratio of 150 per cent.

Related Research Work and Research Gap

The Extant Efficiency Literature Relating the General Sector

Compared to the life insurance industry, there are relatively fewer studies devoted to the efficiency and productivity performance of the general sector.

Toivanen (1997) examined the economies of scale and scope in the Finnish general insurance industry for the period 1989-91. He decomposed the production process of the general companies into cost and portfolio management functions. Empirical evidence corresponding to the Finnish general insurance market implied that the creation of a branch network is important for gaining market power or informational advantages. The study confirmed the presence of diseconomies of scale at the firm level, economies of scale at the branch level and economies of scope on production.

Fukuyama and Weber (2001) examined efficiency and productivity growth of Japanese general insurance companies for the period 1983-1994. The paper estimated Farrell, Russell and Zieschang measures of output oriented technical efficiency and constructed Malmquist index of productivity growth based on these measures. The Malmquist index was decomposed into indices of efficiency and technological change. The results from the study showed that between 1983-90 productivity improved significantly and it was mainly contributed by technological change. In the next three years the collapsed bubble economy resulted in the stagnation of technological change. However, by 1993-94, there was again an upturn in technological change.

Brockett, Cooper, Golden, Rousseau and Wang (2004) examined the efficiency of insurance companies using data envelopment analysis in terms of a financial intermediation approach

with three output indicators : solvency, claims paying ability and return on investment. The impact of solvency on efficiency is then examined. The efficiency scores with and without solvency are further examined to study the performance of different forms of insurance organisation.

Choi and Weiss (2005) examined the linkage between firm performance, market structure and efficiency in property-liability insurers during 1992-1998 in terms of a stochastic frontier analysis. The study estimated cost and revenue efficiency of the in-sample insurance companies. The objective of the study was to examine the validity of SCP (structure-conduct-performance) hypothesis, RMP (relative market power) hypothesis, and ES (efficient structure) hypothesis. The results obtained by Choi and Weiss provides support for the efficient structure hypothesis which states that more efficient firms can charge lower prices than competitors, which permits them to occupy larger market shares and extract economic rents, resulting in increased concentration in the industry. Thus regulators should be more concerned about efficiency compared to relative market power.

Yang (2006) used two stage DEA in order to estimate the performance of life and health insurance industry in

Canadian context. In the first stage, two different models (production and investment) were used for the computation of efficiency. Estimation was made under both input and output orientations. In the next stage, the input used was a dummy (having value 1) was the outputs included the production and inverted investment efficiency scores. This approach thus integrated the production as well as investment performance for efficiency evaluation. The evidence showed that the Canadian Life & Health insurance industry operated more or less in an efficient manner during the in-sample period.

Kao and Hwang (2006) made use of a two-stage DEA model to evaluate the performance of 24 Taiwanese general insurance companies using data for the years 2001 and 2002. The study decomposed activities of insurance firms into two sub-processes. The outcome of the study reveal some unusual findings compared to the black box model. Particularly, none of the insurers included in the study were found to have full efficiency in both the stages.

Barros et.al. (2010) evaluated the performance of 71 Greek insurance companies (including life and general) with the application of two stage boot strapped DEA estimation. Efficiency evaluation was made under constant returns to scale for the period of

European insurance market deregulation (1994-2003). The first stage results confirmed the existence of significant divergence in efficiency scores. The second stage regression outcome pointed towards competition as a major determinant of efficiency. However, the degree of competition itself was insufficient for improving market efficiency.

The European Commission initiated single market program changed the competition scenario in the insurance industry as it removed restrictions on cross-border activities. The impact of this programon the technical/cost/revenue efficiency and change in total factor productivity of the German insurance companies was estimated by Mahlberg and Url (2010) relative to the timeperiod 1991-2006. The in-sample observations for the study includes an unbalanced panel of 202 insurance companies. Mahlberg and Url (2010) estimated technical, revenue and cost efficiency under NIRS (non-increasing returns to scale). Further, they computed Malmquist index of productivity change. The outcomes of the study reveal a mixed picture of convergence of performance.

In an important study concerning the U.S. property-liability insurance companies, Cummins and Xie (2013) evaluated efficiency, productivity and the presence of economies of scale. The study estimated efficiency and the Malmquist index of change in total factor productivity by using data envelopment analysis. The outcome of the study revealed that the majority of the insurers below median size in the industry have increasing returns to scale, and the majority of the insurers above median size have decreasing returns to scale implying the presence of an inverse relationship between returns to scale and insurer size.

Alhassan and Biekpe (2015) estimated efficiency, productivity and returns to scale economies for the general insurance market in South Africa using data for 2007 to 2012. They employed DEA to estimate efficiency, returns to scale and Malmquist index of change in total factor productivity. In the second stage, they used truncated boots trapped regression and logistic regression techniques in order to identify the determinants of efficiency and the probability of operating under global technology (constant returns to scale) respectively. The outcomes of the study revealed thatgeneral insurers operate with about 50 per cent inefficiencies. Further, approximately 20 per cent of insurers operate at an optimal scale. They also found productivity improvements attributable to technological changes. The results of the regression

analysis exhibited a non-linear effect of size on efficiency and constant returns to scale. Overall, the study indicated that factors such as diversified product line, reinsurance of exposure and leverage had a impact on efficiency and presence of global technology.

In the Indian context, Sinha (2007, 2009) examined the efficiency and productivity performance of Indian general insurance industry. In another study, Mandal and Ghosh Dastidar (2014) estimated the operating performance of 12 general insurance companies for the period 2006-2007 to 2009-2010 using Data Envelopment Analysis (DEA). The study also estimated the impact of global recession on the general sector. Sinha (2017a) used a dynamic DEA model to estimate the dynamic efficiency performance of Indian general insurance companies. In another study Sinha (2017b) made efficiency evaluation of Indian general insurance companies for 2013-14 using the double bootstrap method.

The Research Gap

While there are several studies corresponding to the Indian general sector which tried to evaluate the efficiency performance of the general insurance companies, all of them have focussed on the insurance companies as individual entities. It is a common knowledge

that the public and private sector general insurance companies have different ownership and operational characteristics, inter alia, such differences manifest themselves in various forms including variations in the fulfilment of universal service obligations, customer profile or branch presence etc. This is perhaps the first study which considers the public and private sector general insurers as separate groups/systems. In the present study, the efficiency of one group is evaluated by taking the other group as the reference set and vice versa. Next, rank sum test is deployed to draw inference about the relative performance of each group. Finally, the linkage of the efficiency performance is explored in terms of censored regression.

Measurement of Performance : The Methodological Issues

In the parlance of economics, efficiency implies how well a firm isable to transform inputs in to outputs. In other words, efficiency may be defined as the use of fewest inputs to produce the largest possible output. Thus efficiency of a firm is closely connected to the technology of the firm. This is because for the estimation of efficiency, observed productive activity needs to be compared against the maximum quantity producible which given by the underlying technology. In this context, Shephard (1953,1970) introduced the

concepts of input and output distance functions. A firm is technically efficient from the input perspective if a contraction of input leads to a decline in outputand it is efficient from the output perspective if more output is not producible with the present level of input. The input distance function gives the maximum amount by which the producer's input vector can be radially contracted. The output distance function, on the other hand, gives the minimum amount by which the producer's output vector can be deflated and yet remain feasible for a given input vector.

Farrell (1957) identified that the overall efficiency of a firm is the product of technical and price (allocative) efficiency. From the input oriented standpoint a firm's technical efficiency is the ratio of best practice input usage to actual input usage,output held constant. Similarly, from the output oriented standpoint, technical efficiency is the ratio of actual output to best practice, input held constant Farrell's definitions of efficiency had close connections with the concepts of distance function since the reciprocal of the input distance function can be considered as the radial measure of input oriented technical efficiency whereas the radial measure of output oriented technical efficiency coincides with the output distance function.

Charnes, Cooper and Rhodes (1978) provided an extension of Farrell's Single input single output technical efficiency measure to the multiple output-multiple input case and their contribution resulted in the genesis of Data Envelopment Analysis (DEA). Charnes, Cooper and Rhodes (1978) proposed a fractional mathematical programming model. Under the assumption of constant returns to scale, the objective of the CCR model has been to maximise the productivity ratio for each of the observed decision making unit. Productivity in this context is defined as the ratio of weighted total of outputs and weighted total of inputs which can be maximised (or the inverse can be minimised) by appropriately selecting the weights. This ratio (which lies between 0 and 1) serves as a measure of efficiency.

The Radial Banker-Charnes-Cooper Model

The Banker-Charnes-Cooper (1984) model permitted DEA based estimation of efficiency of decision-making units under the assumption that technology is local. Let us now consider a productive firm which produces a scalar output Y from a bundle of k inputs $X=(x_1, x_2, \ldots, x_k)$. Let (x^i, y^i) denote the observed input-output bundle of firm i (i=1, 2, …, n). The technology used by the firm is defined by the production possibility set.

Ts = {(x, y) | x can produce y }

An input-output combination (x^0, y^0) is feasible if and only if $(x^0, y^0) \in$ Ts

We assume that the decision-making unit is an input minimiser (given the level of output(s)). The firm's optimization exercise can, therefore, be written as :

$$Min\theta$$

Subject to : $\theta x^0 \geq \Sigma xy$, $y^0 \leq y\lambda$, $\Sigma y = 1$, $\lambda \geq 0$

If we write the production function as : Y = f(X) then it implies that $X = f^{-1}(Y)$. Let X^* represent the minimum input corresponding to a given level of output (say Y_f). In the presence of technical in efficiency, x^0 (=observed output) $\leq x^*$ where x^* represents optimal input. Technical efficiency of the firm is therefore : optimal input usage/observed input usage $= \dfrac{x^*}{x^0} = \theta$. Under the assumption of convexity, X^* can be obtained from the convex combination of two best practice observed points in the Banker-Charnes-Cooper envelopment model, technical efficiency lies between 0 and 1 because of the inclusion of the observed decision making unit in the reference set.

The Slacks Based Measure Model

In view of the difficulty encountered by the radial DEA approach in the handling of input and output slacks, Tone (2001) introduced the Slacks Based Measure model. In the non-oriented version of the Slacks Based Measure model, the efficiency of DMU with activity indicated by (x,y) is estimated by the following fractional linear program :

$$Min\, \rho_{non-oriented} = \left(\frac{1 - \dfrac{1}{m}\sum \dfrac{s_i^-}{x_i}}{1 + \dfrac{1}{n}\sum \dfrac{s_j^+}{y_j}} \right)$$

s.t.$x_i = X\lambda + s_i^-$, $y_j = Y\lambda - s_j^+ \lambda \geq 0$, $s_i^- \geq 0$, $s_j^+ \geq 0$

Here s^- and s^+ represent the input and output slacks respectively. The slacks-based measure of efficiency has an additive character i.e., it removes input and output slacks through addition and subtraction from their respective inequalities.

Comparison of Decision-Making Units (DMUs) Belonging to Different Systems

DEA models are based on the assumption of convexity of production possibility set. Convexity implies that if two activities (x_1,y_1) and (x_2,y_2) belong to the production possibility set then each point lying on the segment combining the two activities also lies within the production possibility set. However, when the decision-making units belong

to two different systems , this assumption becomesinvalid. For example, the activities (x_1, y_1) and (x_2, y_2) may be accomplished by using different methodology/technology. Consequently, no activity formed out of weighted average of the two is feasible.

For the purpose of comparing DMUs belonging to two different systems (say A and B), the inputs may be divided in to X_a ($\in A$) and X_b ($\in B$) and the outputs in to Y_a ($\in A$) and Y_b($\in B$). As indicated earlier, convexity holds within the same system but not across systems. In order to understand the differences in performance across the system, the decision-making units corresponding to the two systems are now evaluated using a bilateral comparison framework. The distinguishing feature of this framework is that when decision making units included in a particular system (say system A) are evaluated, the benchmark reference set for A excludes system A decision-making units. Thus in the radial model, the technical efficiency score for any observed DMU 'a' (which is a member of system A) is computed from the following optimization program :

$$\text{Min}\,\theta$$

$$\sum_{j \in B} x_j \lambda_j \leq \theta x_a, \quad \sum_{j \in B} y_j \lambda_j \geq y$$

$$\lambda_j \geq 0 \left(\forall j \in B \right)$$

Then Technical Efficiency $\theta = \dfrac{\sum_j x_j \lambda_j}{x_a}$

Similar procedure may be adopted for any observed DMU included in system B. Note that since the data set for the DMU under evaluation is not included for the evaluation purpose, the technical efficiency score can be greater than 1.

In the slacks based measure model, the technical efficiency score for any observed DMU 'a' (which is a member of system A) is computed from the following optimization program :

$$\text{Min}\,\rho a_{\text{non-oriented}} = \left(\dfrac{1 - \dfrac{1}{m} \sum \dfrac{s_i^-}{x_{ia}}}{1 + \dfrac{1}{n} \sum \dfrac{s_j^+}{y_{ja}}} \right)$$

$\text{s.t.}\,x_i = X_B \lambda + s_i^-,\ y_j = Y_B \lambda - s_j^+ \lambda \geq 0,$
$s_i^- \geq 0,\ s_j^+ \geq 0$

Similar procedure may be adopted for any observed DMU included in system B.

Statistical Significance of Efficiency Scores

When we compare the efficiency of two different categories, it is often useful to test the efficiency difference between two groups statistically. However, one cannot make use of parametric tests for this purpose

because the theoretical distribution of efficiency scores in DEA is unknown. Under the circumstances, one needs to make use of non-parametric tests for which the distribution of efficiency scores are statistically independent.

Brockett and Golany (1996) introduced the Rank-Sum Test for comparing the distribution of efficiency scores of the in-sample DMUs belonging to the two different categories : A and B. The test is based on the ranking of data. Compared to the parametric tests suggested by Banker (1993), the Rank-Sum Test has several advantages. Firstly, unlike the methods suggested by Banker, no parametric assumptions regarding the distribution of inefficiency is required. Secondly, non-parametric rank procedures can be used for any sample size. In the next paragraph, the methodology is described briefly.

Let the data pertaining to two groups of observation be represented by A = $\{a_1, a_2, ..., a_p\}$ and B=$\{b_1, b_2, ..., b_q\}$. Now we form a new series C by merging A and B in which the data are arranged in descending order. C is now ranked from 1 to R(=p+q). If there is a tie, the mid rank is used for the tied observation. Next, the A's rank data are summed. Let the resultant figure be S.

The statistic S, follows an approximately normal distribution with mean p(p+q+1)/2 and variance pq(p=q+1)/12

for m,n$\geq$10. By normalizing S, we have :

$$Z = \frac{S - \dfrac{p(p+q+1)}{2}}{\sqrt{\dfrac{pq(p+q+1)}{12}}}$$

Z has an approximately standard normal distribution. Using Z, we can test the normal hypothesis that the two groups have same distribution against the alternative hypothesis at a significance level α. The null hypothesis is rejected if $Z \leq -Z_{\alpha/2}$ or $Z \geq Z_{\alpha/2}$. Here $Z_{\alpha/2}$ correspond to the upper $\alpha/2$ percentile of the standard normal distribution.

In our case, the number of observations included in group 2 is 4 (<10). Thus we have the degree of freedom problem. In order to avoid the problem, the decision-making units corresponding to both the groups are projected on the respective frontiers for getting a combined efficient frontier.

Impact of Contextual Variables on Efficiency Scores

Efficiency evaluation of decision-making units is done only basis of certain suitable output and input indicators. However, the input-output conversion process is also influenced by other contextual variables. Thus most of the DEA models make use of a multistage model in which in the first stage efficiency scores are obtained from a

non-parametric estimation and in the next stage the relationship of efficiency score with contextual variables is estimated econometrically. H

However, since the DEA efficiency scores are bounded, ordinary least square method can be applied only after transforming the data. In the present study, we have, however, used censored regression. Censoring occurs when the data relating to the dependent variable is either limited/lost while the data on the independent variables may be available. In a censored regression model, the dependent variable is either left or right censored, or both type of censoring is present. The lower or upper limit of the dependent variable can be any number. The censored regression model can be represented as :

$$Y_i^* = X_i\beta + \varepsilon_i$$

$$\text{where } \varepsilon_i \sim N(0, \sigma^2)$$

$Y = Y_a$ if $Y^* \leq 0$, $Y = Y^*$ if $Y_a < Y^* < Y_b$ and $Y_a = Y_b$ if $Y^* \geq 0$

Y^* is a latent (unobserved) variable and is the observed variable. The probability density function of is the same as of the latent variable Y^*. X is a vector of regressors. Y_a and Y_b represent the lower and upper bounds of the dependent variable. β is a vector of unknown parameters and ε represents the disturbance term.

Censored regression models are estimated by the Maximum Likelihood method. Given the assumption that the disturbance term ε is having normal distribution with mean 0 and variance σ^2, we can write the log-likelihood function as :

$$\text{Log L} = \sum \left[I_a \log \varphi \left(\frac{Y_a - x'\beta}{\sigma} \right) + I_b \log \varphi \left(\frac{x'\beta - Y_b}{\sigma} \right) \right. $$
$$\left. + (1 - I_a - I_b) \left\{ \log \mu \left(\frac{y - x'\beta}{\sigma} \right) - \log \sigma \right\} \right]$$

Here φ (.) and μ (.) denote the cumulative distribution and probability density function respectively of the standard normal distribution. I_a & I_b are the indicator functions with

$I_a = 1$ if $Y = Y_a$ and $I_a = 0$ if $Y > Y_a$ and $I_b = 1$ if $Y = Y_b$ and $I_b = 0$ if $Y > Y_b$.

Data, Results and Discussion

Description of Variables

For the estimation of efficiency performance of general insurance companies, it is essential to identify the input and output variables which is a challenging job for the financial services industry in general and for the insurance sector in particular. This is because there are long standing disagreements as to which are the ideal indicators of inputs, outputs and prices for the financial services industry. Some variables (like net premium or deposit) are used as

inputs in some research studies whereas they are considered as outputs in other studies.

There are two major approaches of choosing the outputs of insurance companies : the value added approach and the flow approach. The value added approach selects output on the basis of the amount of financial services provided by the insurers. The flow approach includes three outputs (return on asset, liquid assets to liabilities and solvency scores) which are indicators of financial safety.

In the present study, we have used the value added approach for the selection of outputs and inputs. There are several reasons for this. First, for many of the relatively new entrants, return on asset is negative creating obvious difficulties in performance benchmarking. Second, with limited data disclosure, it is difficult to get liquid assets to liabilities ratio figures. The inputs are operating expenses and net premium income and the outputs are asset under management and benefits paid (refer Table-2). Solvency ratio (which is taken as output in the flow approach) is included as the environmental

variable. The model has been checked for isotonicity.

Collection of Data, Orientation and Returns to Scale

The data relating to the input, output and contextual variable are collected from the IRDA Annual Reports and Handbook of Insurance Statistics for the relevant years. Estimation has been made under the assumption of variable returns to scale. For the radial approach (which uses the Banker-Charnes-Cooper framework), input orientation has been used. However, the non-oriented slacks based measure model has been used for the non-radial estimation.

Descriptive Statistics of Efficiency Scores

We are interested to know how the private and public sector insurers have performed during the period under observation. The present sub-section has three tables which provide the mean efficiency scores under the radial and non-radial approaches. Table-3 provides the scores for the entire set of observations. Table-4 and Table-5 highlight the picture relating to the two ownership categories. Table-4 indicates

Table-2 : Inputs, Outputs and Contextual Variable

Inputs	Outputs	Contextual Variable
Operating Expenses, Net Premium Income	Asset Under Management, Benefits Paid	Solvency Ratio

that across the observed years, mean efficiency of the in-sample general insurance companies has diminished while the same has improved for the public sector companies. However, the private sector trend is largely influenced by the abnormally high efficiency scores reported by SBI General Insurance company during 2011-12 and 2012-13. Accordingly, revised mean radial and non-radial efficiency scores are also included by removing the scores of the company. The inter-temporal changes are now less dramatic.

Table-3 : Descriptive Statistics of Efficiency Scores-All Observed Insurers

Particulars	2011-12	2012-13	2013-14	2014-15	2015-16
Mean efficiency (radial measure)	12.8605	5.2865	4.2742	4.5014	2.47348
Mean efficiency (slacks based measure)	8.5156	4.6405	3.9334	3.9884	2.0480

Source : Calculated.

Table-4 : Descriptive Statistics of Efficiency Scores-Private Sector Insurers

Particulars	2011-12	2012-13	2013-14	2014-15	2015-16
Mean Efficiency (radial measure)	16.8140	6.7153	5.3657	5.6686	2.9655
Revised Mean radial efficiency	4.2928	4.0365	3.9301	4.3782	2.3674
Mean Efficiency (slacks based measure)	10.7804	5.5767	4.6323	4.6765	2.3603
Revised Mean non-radial efficiency	4.0352	3.8990	3.6675	3.8651	1.9764

Source : Calculated.

Table-5 : Descriptive Statistics of Efficiency Scores-Public Sector Insurers

Particulars	2011-12	2012-13	2013-14	2014-15	2015-16
Mean Efficiency (radial measure)	1	1	1	1	0.9985
Mean Efficiency (slacks based measure)	1.7212	1.8316	1.8367	1.9239	1.1108

Source : Calculated.

Insurer-wise Scores

and 7 provide the efficiency scores for the sixteen observed general insurers relative to the five year period (2011-12 to 2015-16). As per the results, Shri Ram General Insurance Company performed most consistently throughout the period.

Testing of Hypothesis

In order to compare the performance of private and public sector general insurers, it is essential to compare the distribution of efficiency scores. For this, we take the help of rank sum test. The general insurers are classified in to two groups : Group-1 comprising of

Table-6 : Insurer-wise Efficiency Scores (Radial Bilateral Comparison)

Insurer	2011-12	2012-13	2013-14	2014-15	2015-16
Bajaj Allianz	2.0148	2.2442	2.1230	2.4891	0.7280
BhartiAxa	8.6660	6.0777	5.4479	5.5475	3.6477
Cholamandalam	5.6298	5.2387	4.5484	5.5139	2.5946
Future Generali	9.3857	7.2887	6.6974	6.7609	4.2667
HDFC Ergo	5.3507	4.5071	3.9734	3.7671	2.7077
ICICI Lombard	1.5517	1.6904	1.3930	1.6950	1.3407
IFFCO Tokio	3.8416	3.8864	3.5365	3.7973	1.5529
Reliance	4.2069	4.4548	3.8611	4.3670	2.2034
Royal Sundaram	4.4280	4.8751	4.9665	5.5094	3.0388
SBI General	141.3771	24.0356	9.4358	6.3500	4.0694
Shri Ram General	10.8035	12.4029	14.8460	18.1199	7.3931
Tata AIG	4.5126	3.8819	3.5589	4.1060	2.0435
National	1.0000	1.0000	1.0000	1.0000	1.0190
New India	1.0000	1.0000	1.0000	1.0000	1.0000
Oriental	1.0000	1.0000	1.0000	1.0000	0.9749
United	1.0000	1.0000	1.0000	1.0000	1.0000

Source : Calculated.

Table-7 : Insurer-Wise Efficiency Scores (Non-Radial Bilateral Comparison)

Insurer	2011-12	2012-13	2013-14	2014-15	2015-16
Bajaj Allianz	1.9960	2.0584	1.9137	2.0051	0.6869
BhartiAxa	6.6714	5.4941	4.9474	5.2518	2.3238
Cholamandalam	5.2300	4.9485	4.3545	4.6569	2.2862
Future Generali	7.5625	7.0830	6.4774	6.3510	3.6181
HDFC Ergo	5.0118	4.4268	3.8649	3.7638	2.0536
ICICI Lombard	1.4652	1.5307	1.3804	1.5138	1.1192
IFFCO Tokio	3.7566	3.6224	3.2925	3.0439	1.5335
Reliance	3.8700	4.2253	3.6414	3.7902	1.9634
Royal Sundaram	4.1314	4.7594	4.7454	5.0658	2.6974
SBI General	75.7225	15.7622	7.9215	5.8368	3.1219
Shri Ram General	9.9084	9.1717	9.5105	11.2290	5.1226
Tata AIG	4.0397	3.8382	3.5378	3.6104	1.7974
National	1.5848	2.0785	1.7738	1.8029	1.0073
New India	2.2079	1.9876	2.4278	2.6738	1.3916
Oriental	1.3396	1.3320	1.3270	1.3020	0.8793
United	1.7526	1.9284	1.8181	1.9168	1.1651

Source : Calculated.

private sector insurers and Group-2 comprising of public sector insurers. The outcomes of the test (for the in-sample years) are presented in Tables-8 through 12). In the aforementioned Tables, efficiency scores of the insurers for both the radial and slacks based measure models have been compared. In all the cases, the test statistics suggest that Group-1 out performs Group-2. It may be added in this context that this outcome is not affected even if we exclude Shri Ram General Insurance Company from the set of observations.

Relationship of Bilateral Comparison Model Efficiency with Solvency

For exploring the relationship between efficiency and solvency ratio, we take the help of censored regression. In the present analytical framework, efficiency scores can be greater than 1, we make

Table-8 : Rank Sum Statistics and Testing of Hypothesis (2011-12)

Measure of Efficiency	Insurer Type	Rank Sum Statistics	Test Statistics	Level of Significance (%)
Radial measure	Private Sector	78	-2.9104	0.3609
	Public Sector	58		
Slacks based measure	Private Sector	82	-2.4254	1.5293
	Public Sector	54		

Source : Calculated.

Table-9 : Rank Sum Statistics and Testing of Hypothesis (2012-13)

Measure of Efficiency	Insurer Type	Rank Sum Statistics	Test Statistics	Level of Significance (%)	Measure of Efficiency
Radial measure	Private Sector	78	-2.9104	Group-1 outperforms Group-2	0.3609
	Public Sector	58			
Slacks based measure	Private Sector	82	-2.4254	Group-1 outperforms Group-2	1.5293
	Public Sector	54			

Source : Calculated.

Table-10 : Rank Sum Statistics and Testing of Hypothesis (2013-14)

Measure of Efficiency	Insurer Type	Rank Sum Statistics	Test Statistics	Decision	Level of Significance (%)
Radial measure	Private Sector	78	-2.9104	Group-1 outperforms Group-2	0.3609
	Public Sector	58			
Slacks based measure	Private Sector	82	-2.4254	Group-1 outperforms Group-2	1.5293
	Public Sector	54			

Source : Calculated.

Table-11 : Rank Sum Statistics and Testing of Hypothesis (2014-15)

Measure of Efficiency	Insurer Type	Rank Sum Statistics	Test Statistics	Decision	Level of Significance (%)
Radial measure	Private Sector	78	-2.9104	Group-1 outperforms Group-2	0.3609
	Public Sector	58			
Slacks based measure	Private Sector	82	-2.4254	Group-1 outperforms Group-2	1.5293
	Public Sector	54			

Source : Calculated.

Table-12 : Rank Sum Statistics and Testing of Hypothesis (2015-16)

Measure of Efficiency	Insurer Type	Rank Sum Statistics	Test Statistics	Decision	Level of Significance (%)
Radial measure	Private Sector	82	-2.4254	Group-1 outperforms Group-2	1.5293
	Public Sector	53			
Slacks based measure	Private Sector	84	-2.1828	Group-1 outperforms Group-2	3
	Public Sector	52			

Source : Calculated.

use of left censored Tobit regression. The model includes an ownership dummy (1 for private insurers and 2 for public sector insurers) and a time series dummy (1 for 2011-12, 2 for 2012-13 and so on). Since we have two sets of efficiency scores (from the radial and non-radial models), we have two sets of estimates included in Tables-13 and 14 respectively. In the radial model, coefficients of all of the explanatory variables (solvency ratio, time series dummy and ownership dummy) are significant. In the non-radial slacks based measure model, however, coefficient of the time series dummy is not statistically significant.

Conclusion

While the insurance market composition has changed in India remarkably and has altered the extant business practices of the public sector insurers in more than one ways, the managerial styles continue to differ for the two groups of insurance companies. The extant efficiency literature relating to the general insurance industry compared

Table-13 : Efficiency Solvency Relationship (Radial BCC Model)

Particulars	Coefficient	Std. Error (SE)	Coefficient/SE	p-value
Constant	-6.32446	3.01764	-2.0958	0.03610
Solvency	13.8737	1.51443	9.1610	<0.00001
Time Series Dummy	-1.25406	0.44011	-2.8494	0.00438
Ownership Dummy	-7.72007	1.68387	-4.5847	<0.00001

Source : Calculated.

Table-14: Efficiency Solvency Relationship (Non-Radial SBM Model)

Particulars	Coefficient	Std. Error	Coefficient/SE	p-value
Constant	4.47673	0.989137	4.5259	<0.00001
Solvency	0.862471	0.335709	2.5691	0.01020
Time Series Dummy	0.120064	0.171568	0.6998	0.48405
Ownership Dummy	-2.46844	0.422268	-5.8457	<0.00001

Source : Calculated.

the performance of the insurance companies without considering their group affiliation. Thus, the entire input and output data set is used for constructing the reference set of efficiency evaluation. The present study has taken a different path of efficiency estimation by considering the private and public sector general insurers as two separate systems. For estimation of efficiency, the performance of one group of insurer is evaluated by taking the data pertaining to the other group as the reference set and vice versa. The distribution of efficiency is then compared in terms of non-parametric test. Further, the linkage between operating performance and financial health is estimated in terms of censored regression framework with solvency ratio being taken as the indicator of financial health. The regression results indicate that efficiency is significantly influenced by solvency and the results are consistent with Sinha (2017a, 2017b).

One interesting outcome of the present study is that the private sector general insurers as a group have consistently outperformed the public sector general companies. While the central government has already initiated merger of three out of the four public sector insurers, however, it is also essential to investigate in detail the reasons behind their relatively weaker performance.

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Assessing Systematic Risk Using Time Series Regression : An Evidence from Indian Capital Market

R.P. Prakash* & Prakash Basanna**

Capital markets of neighboring transition countries have been attracting significant attention of the wide investment public in the past ten years. These markets were characterized by high return, and in consequence, high volatility of securities' return as compared to developed capital markets. However, there is no consensus as to which pricing model should be used to estimate the volatility of stocks' returns in these markets. The current study is descriptive research and quantitative approach which is based on secondary data. The researchers have chosen 50 sample stocks from CNX500 of NSE. The returns of individual stocks are collected for the period from 2013-17 after adjusting for corporate actions and splits and mergers. The stock prices collected for the sample are converted into discrete monthly returns and used as a dependent variable. The results show that the stocks with higher risk have higher return. The parameter with beta coefficient is positive and Y1 is less than Rm-Rf. Hence, the first hypothesis (i.e. constant (Yo) is equal to risk free rate) is accepted. This paper does not exclude the possibility of other sources of risk that affect the dynamics of return. In overall the variation in stocks returns cannot be explained by market return alone to the extent of 40.1 per cent due to other factors influencing on the stock return.

Keywords : CAPM, Risk and Return, Systematic Risk, Beta, Defensive and Aggressive Stocks.

Introduction

Capital markets of neighboring transition countries have been attracting significant attention of the wide investment public in the past ten years. These markets were characterized by high return, and in consequence, high volatility of securities' return as compared to developed capital markets. However, there is no consensus as to which pricing model should be used to estimate the volatility of stocks' returns in these markets.

The Capital Asset Pricing Model (CAPM) given by Lintner and Sharpe is the foundation of the capital market theory and a continuation of the single-period return variance model developed by Markowitz in 1952 and Tobin in 1958,

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utilizing the Expected Utility Theory from Von Neumann and Morgenstern in 1944. The single factor model CAPM assumes that the return of every individual security is linked to a single factor. In this model, the number of estimated variables is much lower than that of Markowitz model, which is its basic advantage.

According to the CAPM, the relevant risk measure of individual risky assets is its contribution to the variance of a well-diversified portfolio, measured by beta coefficient. Considering that investors are risk-averse, it is intuitive that a stock with a higher risk (higher beta) should yield a higher return than a stock with a lower beta. The CAPM model suggests that an asset with a zero beta, in equilibrium, will yield an expected return equal to that of a risk-free rate, and that the expected return of all risky assets must be higher than the risk-free rate for a risk premium, that is in direct proportion with the beta. In the rational and competitive market investors diversify the entire unsystematic risk, thus pricing assets according to the systematic risk. Testing the standard requires the verification of the following three hypotheses :

- A higher risk (higher beta) should be related to higher return.

- The return is linearly correlated with the beta; therefore, for every unit increase of beta, we will have the same increase of return.

- The capital market rewards only systematic risk which means that unsystematic risk should not increase the return.

Review of Related Literature

Tests of the CAPM are based on three implications of the relation between expected return and market beta implied by the model. First, expected returns on all assets are linearly related to their betas, and no other variable has marginal explanatory power. Second, the beta premium is positive, meaning that the expected return on the market portfolio exceeds the expected return on assets whose returns are uncorrelated with the market return. Third, in the Sharpe – Lintner version of the model, assets uncorrelated with the market have expected returns equal to the risk free interest rate, and the beta premium is the expected market return minus the risk free rate. Most tests of these predictions use either cross-section or time-series regressions. Both approaches date to early tests of the model.

To improve the precision of estimated betas, researchers such as Blume (1970), Friend and Blume (1970), and Black, Jensen, and Scholes (1972) work with portfolios, rather than individual securities. Since expected returns and market

betas combine in the same way in portfolios, if the CAPM explains security returns it also explains portfolio returns. Estimates of beta for diversified portfolios are more precise than estimates for individual securities. Thus, using portfolios in cross-section regressions of average returns on betas reduces the critical errors in variables problem. Grouping, however, shrinks the range of betas and reduces statistical power. To mitigate this problem, researchers sort securities on beta when forming portfolios; the first portfolio contains securities with the lowest betas, and so on, up to the last portfolio with the highest beta assets. This sorting procedure is now standard in empirical tests.

Fama and Macbeth (1973) propose a method for addressing the inference problem caused by correlation of the residuals in cross-section regressions. Instead of estimating a single cross-section regression of average monthly returns on betas, they estimate month-by-month cross-section regressions of monthly returns on betas. The times series means of the monthly slopes and intercepts, along with the standard errors of the means, are then used to test whether the average premium for beta is positive and whether the average return on assets uncorrelated with the market is equal to the average risk free interest rate. In this approach, the standard errors of the average intercept and slope are determined by the month-to-month variation in the regression coefficients, which fully captures the effects of residual correlation on variation in the regression coefficients, but sidesteps the problem of actually estimating the correlations. The effects of residual correlation are, in effect, captured via repeated sampling of the regression coefficients.

Jensen (1968) was the first to note that the Sharpe –Lintner version of the relation between expected return and market beta also implies a time-series regression test. The Sharpe–Lintner CAPM says that the average value of an asset's excess return (the asset's return minus the risk free interest rate, (R_{it} - R_{ft}) is completely explained by its average realized CAPM risk premium (its beta times the average value of (R_{mt} - R_{ft}). This implies that "Jensen's alpha," the intercept term in the time-series regression. The early tests firmly reject the Sharpe –Lintner version. The early tests firmly reject the Sharpe–Lintner version of the CAPM. There is a positive relation between beta and average return, but it is too "flat". Recall that, in cross-section regressions, the Sharpe–Lintner model predicts that the intercept is the risk free rate and the coefficient on beta is the expected market return in excess of the risk free rate, E (RM) - Rf. The regressions consistently find that the intercept is greater

than the average risk free rate (typically proxied as the return on a one-month Treasury bill), and the coefficient on beta is less than the average excess market return (proxied as the average return on a portfolio of U.S. common stocks minus the Treasury bill rate). This is true in the early tests, such as Douglas (1968), Black, Jensen and Scholes (1972), Miller and Scholes (1972), Blume and Friend (1973), and Fama and MacBeth (1973), as well as in more recent cross-section regression tests, like Fama and French (1992). The evidence that the relation between beta and average return is too flat is confirmed in time series tests, such as Friend and Blume (1970), Black, Jensen, and Scholes (1972), and Stambaugh (1982). The intercepts in time series regressions of excess asset returns on the excess market return are positive for assets with low betas and negative for assets with high betas.

In the framework of Fama and MacBeth (1973), one simply adds predetermined explanatory variables to the month-by-month cross-section regressions of returns on beta. If all differences in expected return are explained by beta, the average slopes on the additional variables should not be reliably different from zero. Clearly, the trick in the cross-section regression approach is to choose specific additional variables

likely to expose any problems of the CAPM prediction that, because the market portfolio is efficient, market betas suffice to explain expected asset returns. For example, in Fama and MacBeth (1973) the additional variables are squared market betas (to test the prediction that the relation between expected return and beta is linear), and residual variances from regressions of returns on the market return (to test the prediction that market beta is the only measure of risk needed to explain expected returns). These variables do not add to the explanation of average returns provided by beta. Thus, the results of Fama and MacBeth (1973) are consistent with the hypothesis that their market proxy – an equal-weight portfolio of NYSE stocks – is on the minimum variance frontier.

Fama and French (1992) also confirm the evidence (Reinganum, 1981, Stambaugh, 1982, Lakonishok & Shapiro, 1986) that the relation between average return and beta for common stocks is even flatter after the sample periods used in the early empirical work on the CAPM. The estimate of the beta premium is, however, clouded by statistical uncertainty (a large standard error). Kothari, Shanken, and Sloan (1995) try to resuscitate the Sharpe – Lintner CAPM by arguing that the weak relation between average return

and beta is just a chance result. But the strong evidence that other variables capture variation in expected return missed by beta makes this argument irrelevant. If betas do not suffice to explain expected returns, the market portfolio is not efficient, and the CAPM is dead in its tracks. Evidence on the size of the market premium can neither save the model nor further doom it.

Under the strong assumptions, the single factor CAPM implies a linear relation between expected return and expected risk :

$$E(R_i) = R_f + (E(R_m) - R_f)b_i \quad .....(1)$$

Where E (R_i) is expected return on individual stocks, R_f is the risk-free rate, $E(R_m)$ is the expected return on the market portfolio and b_i is beta coefficient of individual stock.

In empirical tests, ex-ante variables in the market model are substituted with ex-post variables, which are called the ex-post version of the CAPM; expected returns are replaced with historical returns, and beta coefficient is estimated from the regression analysis.

The most empirical tests of the CAPM validity employ the traditional two-stage regression procedure. In the first step, the beta coefficient from CAPM model is estimated for every company from the sample by the first-stage regression, afterward the validity of the CAPM model is tested by the second-stage regression. Thereby we have two different procedures; direct and indirect tests.

In the first-stage time series regression of the systematic risk, beta is estimated by the linear regression method. We estimate the following model specification :

$$R_i = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$$

$$I = 1...n; t = 1...T \quad .....(2)$$

Where R_{it} = is return on security, R_{mt} is return on market , α_i is estimated value of the regression line intercept, constant, βi is estimated betas coefficient represents the expected change in stock return with the change in market return, $\varepsilon_{i,t}$ is regression residual and T are the periods in days, weeks, months or years.

In order to estimate beta coefficients of the standard single- factor CAPM model, we use equation (2), in which the independent variable is the return on the previously estimated proxy index of 50 stocks from the capital market of India which we use as the market portfolio proxy, and the dependent variable are discrete returns on stocks 1 to 50. The period of return calculation is one month, and the time series contain 60 observations.

Equation (2) clearly shows that the estimate is made employing full returns, i.e. with no correction in this step of estimating the model for the risk free rate of return. Therefore, the estimated alpha coefficients from the equation (2) are not the measure of undervaluation/ overvaluation; it is an intercept of the regression line on the *y* axis, therefore a constant. On the other hand, the estimated beta coefficients are CAPM betas; therefore, it measures the systematic risk, since the beta represents the regression line slope that remains the same whether the estimate is performed with an excess return over the risk-free rate or with full returns.

Using specific notation, we estimate model (2) with discrete return

$$D_{i,t} = C_i + b_i TP_t + \varepsilon_{i,t}$$

Where D_i is the discrete return on stock *i* where *i*=1...50, *t* is the observation period expressed in months, where t=1... Up to 60 , TP is the discrete return on the proxy index used as the market portfolio proxy, C_i a Constant, b_i the beta coefficient, and + $\varepsilon_{i,t}$ the residual.

Objectives of the Study

- To assess the statistical goodness of the model fit,

- To examine the prediction of stocks as benchmark for evaluating various investments,

- To examine the mean and standard deviation of each stock, and

- To examine the systematic risk as measured by beta coefficient.

Hypotheses

The hypothesis that market betas completely explain expected returns can also be tested using time-series regressions. In the time-series regression described above (the excess return on asset i regressed on the excess market return), the intercept is the difference between the asset's average excess return and the excess return predicted by the Sharpe – Lintner model, that is, beta times the average excess market return. If the model holds, there is no way to group assets into portfolios whose intercepts are reliably different from zero. For example, the intercepts for a portfolio of stocks with high ratios of earnings to price and a portfolio of stocks with low earning-price ratios should both be zero. Thus to test the hypothesis that market betas suffice to explain expected returns, one estimates the time-series regression for a set of assets (or portfolios), and then jointly tests the vector of regression intercepts against zero. The trick in this approach is to choose the left-hand-side assets (or form portfolios) in a way likely to expose any shortcoming of the CAPM prediction

that market betas suffice to explain expected asset returns In early applications, researchers use a variety of tests to determine whether the intercepts in a set of time-series egressions are all zero. The tests have the same asymptotic properties, but there is controversy about which has the best small sample property. Gibbons, Ross and Shanken (1989) settle the debate by providing an F-test on the intercepts that has exact small sample properties. They also show that the test has a simple economic interpretation. In effect, the test constructs a candidate for the tangency portfolio T in Figure-1 by optimally combining the market proxy and the left-hand-side assets of the time series regressions. The estimator then tests whether the efficient set provided by the combination of this tangency portfolio and the risk free asset is reliably superior to the one obtained by combining the risk free asset with the market proxy alone. In other words, the Gibbons, Ross, and Shanken statistic tests whether the market proxy is the tangency portfolio in the set of portfolios that can be constructed by combining the market portfolio with the specific assets used as dependent variables in the time series regressions. In order to test the CAPM hypothesis, the following hypothesis is set.

Ha 1 : Constant (Y_o) is equal to risk free rate.

Ha 2 : Beta value (Y_1) is less than risk premium of market return.

Limitations of The Study

- The paper considers only five years period.

- The sample size is restricted to 50 schemes only. However, the paper has ensured that the samples chosen for the study are fairly representative of the stocks from every perspective.

Research Methodology

The current study is descriptive research and quantitative approach which is based on secondary data. The researchers have chosen 50 sample stocks from CNX500 of NSE. The sample stocks chosen for the study is a balanced representative of the population in the observed period based on the fact that the average share of sample transactions in the population, turnover and market capitalization of the each stock are taken into consideration. The returns of individual stocks are collected for the period from 2013-17 after adjusting for corporate actions and splits and mergers. The stock prices collected for the sample are converted into discrete monthly returns and used as a dependent variable in the estimated model-2.

Sample of Stocks Selected for Assessing Systematic Risk

Sl. No.	Name of the Company	Sl. No.	Name of the Company
1	ABB India Ltd.	26	Lupin Ltd.
2	Adani Power Ltd.	27	Mahindra & Mahindra Ltd.
3	Ashok Leyland Ltd.	28	Mother son Sumi Systems Ltd.
4	Asian Paints Ltd.	29	Muthoot Finance Ltd.
5	Bajaj Finance Ltd.	30	Petro net LNG Ltd.
6	Bharat Forge Ltd.	31	Pfizer Ltd.
7	Cipla Ltd.	32	Power Grid Corporation of India Ltd.
8	Coal India Ltd.	33	Prestige Estates Projects Ltd.
9	Delta Corp Ltd.	34	Raymond Ltd.
10	Dish TV India Ltd.	35	Reliance Communications Ltd
11	DLF Ltd.	36	Shree Renuka Sugars Ltd.
12	GAIL (India) Ltd.	37	Sun Pharmaceutical Industries Ltd.
13	GVK Power & Infrastructure Ltd.	38	Sun TV Network Ltd.
14	Hindustan Motors Ltd.	39	Suzlon Energy Ltd
15	Hotel Leela Venture Ltd.	40	Syndicate Bank
16	ICICI Bank Ltd.	41	Tata Consultancy Services Ltd.
17	IDBI Bank	42	Tata Motors Ltd.
18	Infosys Ltd.	43	Tata Steel Ltd.
19	ITC Ltd.	44	The India Cements Ltd.
20	Jain Irrigation Systems Ltd.	45	Thomas Scott (India) Ltd.
21	Jaypee Infratech Ltd.	46	Titan Company Ltd.
22	Jet Airways (India) Ltd	47	TVS Motor Company Ltd.
23	JK Tyre & Industries Ltd.	48	Vedanta Ltd.
24	JSW Energy Ltd.	49	Vijaya Bank
25	Larsen & Toubro Ltd.	50	Voltas Ltd.

Table-1 : Table Showing the Results of Mean, Standard Deviation and Normality Tests for the Sample Selected for Study

Sl.No.	Company Name	Mean	Standard Deviation	Kolmogorov-Smirnov	Shapiro-wilk
1	ABB India Ltd.	0.92	0.32	0.183	0.001
2	Adani Power Ltd.	1.62	3.37	0.200	0.342
3	Ashok Leyland Ltd.	2.17	2.23	0.001	0.000
4	Asian Paints Ltd.	0.83	0.25	0.001	0.000
5	Bajaj Finance Ltd.	3.34	0.24	0.000	0.000
6	Bharat Forge Ltd.	2.15	0.60	0.000	0.000
7	Cipla Ltd.	0.36	0.00	0.200	0.007
8	Coal India Ltd.	0.29	0.11	0.200	0.002
9	Delta Corp Ltd.	13.54	7.25	0.000	0.000
10	Dish TV India Ltd.	0.58	0.17	0.200	0.480
11	DLF Ltd.	1.08	0.31	0.007	0.019
12	GAIL (India) Ltd.	0.66	0.85	0.039	0.000
13	GVK Power & Infrastructure Ltd.	1.81	0.93	0.190	0.002
14	Hindustan Motors Ltd.	1.30	1.30	0.016	0.004
15	Hotel Leela Venture Ltd.	0.53	0.96	0.020	0.001
16	ICICI Bank Ltd.	0.96	0.18	0.200	0.085
17	IDBI Bank	1.18	1.09	0.018	0.000
18	Infosys Ltd.	0.38	0.46	0.037	0.001
19	ITC Ltd.	0.21	0.92	0.200	0.144
20	Jain Irrigation Systems Ltd.	0.92	0.10	0.200	0.828
21	Jaypee Infratech Ltd.	2.45	3.83	0.000	0.000
22	Jet Airways (India) Ltd	1.46	0.34	0.007	0.015
23	JK Tyre & Industries Ltd.	3.17	4.92	0.000	0.000
24	JSW Energy Ltd.	0.80	2.01	0.200	0.500

(Contd...)

25	Larsen & Toubro Ltd.	0.60	0.18	0.200	0.500
26	Lupin Ltd.	0.45	0.17	0.200	0.001
27	Mahindra & Mahindra Ltd.	0.41	0.26	0.100	0.000
28	Mother Son Sumi Systems Ltd.	2.10	0.08	0.666	0.000
29	Muthoot Finance Ltd.	1.22	1.56	0.200	0.010
30	Petronet LNG Ltd.	1.10	0.906	0.001	0.000
31	Pfizer Ltd.	0.79	3.07	0.000	0.000
32	Power Grid Corporation of India Ltd.	0.49	0.08	0.009	0.000
33	Prestige Estates Projects Ltd.	0.78	1.57	0.059	0.005
34	Raymond Ltd.	1.15	0.89	0.001	0.000
35	Reliance Communications Ltd.	1.4	8.7	0 .000	0.000
36	Shree Renuka Sugars Ltd.	1.44	1.52	0.001	0.000
37	Sun Pharmaceutical Industries Ltd.	0.50	0.21	0.200	0.002
38	Sun TV Network Ltd.	0.99	1.10	0.200	0.006
39	Suzlon Energy Ltd.	1.95	4.13	0.000	0.000
40	Syndicate Bank	1.20	2.58	0.048	0.001
41	Tata Consultancy Services Ltd.	0.53	0.30	0.001	0.000
42	Tata Motors Ltd.	0.60	1.56	0.200	0.290
43	Tata Steel Ltd.	0.85	0.10	0.200	0.141
44	The India Cements Ltd.	1.21	0.79	0.200	0.028
45	Thomas Scott (India) Ltd.	1.72	0.75	0.000	0.000
46	Titan Company Ltd.	1.23	0.81	0.010	0.000
47	TVS Motor Company Ltd.	4.05	0.71	0.002	0.000
48	Vedanta Ltd.	1.18	1.40	0.200	0.020
49	Vijaya Bank	0.53	1.20	0.063	0.031
50	Voltas Ltd.	2.47	0.41	0.007	0.000

Source : The values are obtained using SPSS output-14.0.

Explanatory Power of Mean and Standard Deviation

We have ensured a series of monthly returns for sample stocks, with a minimum of 50 and a maximum of 60 observations. By analyzing the descriptive statistics it is found that 100 per cent stocks have a positive mean, and standard deviation, as a measure of distribution dispersion from its mean, is generally high which indicates the existence of outliers, extreme returns in the distribution.

Kolmogorov–Simonov and Sharpiro-Wilktest of Normality Test

Prior to estimating the model, we have examined whether the returns on stocks in the capital market of India have a normal distribution. In order to test the distribution of stock returns and the proxy index, we have used the Kolmogorov–Simonov and Sharpiro-Wilktest of normality. The zero hypothesis of this test is that the random variable has a normal distribution. If significance level is less than 0.05 we can say that the data is normally distributed and if it is more than 0.05 and then the data are normally distributed. Overall result indicates that the data is normally distributed as the significance level is less than 0.05 for most of the stocks except a few stocks have the significance level more than 0.05 but it cannot be rejected in those cases with

the conventional level of statistical significance of 5 per cent.

Results and Discussion

Durbin-Watson Test

The empiric research of time series assumes that the time series is stationary. The Durbin-Watson test which tests for serial correlations between errors is used in the current study. It tests whether adjacent residuals are correlated or not. The test statistic can vary between 0 and 4 with a value of meaning that the residuals are uncorrelated. A value greater than 2 indicates a negative correlation between adjacent residuals, whereas a value below 2 indicates a positive correlation. The value less than 1 or greater than 3 definitely cause for concern. However, value closer to 2 may not be problematic depending on the sample and model. The analysis resulted into time series of stock prices being closer to 2 for all stocks except a few stocks whose values are more than 2. The assumptions made for the model certainly have been met and the returns on stocks are stationary in time series.

CAPM -Model

According to CAPM, beta coefficient should statistically differ from zero, should be positive and should vary across stocks. Though beta coefficients of all the stocks are not positive; they are statistically significant at 5 per cent

Table–2 : Showing Regression Results of Stocks against NSE CNX–500

Sl. No.	Company Name	R² watson	Durbin-	F-Statistic	Constant (P-value)	Constant	Beta (Beta)	Sig
1	ABB India Ltd.	0.001	1.606	0.038	.828	.637	.079	.847
2	Adani Power Ltd.	0.055	1.574	3.356	2.677	.168	-0.814	.072
3	Ashok Leyland Ltd.	0.017	1.486	0.997	2.874	.221	-0.538	.322
4	Asian Paints Ltd.	0.001	1.600	0.032	.910	.545	-0.062	.860
5	Bajaj Finance Ltd.	0.000	1.256	0.014	3.265	.138	.059	.907
6	Bharat Forge Ltd.	0.002	1.384	0.099	1.965	.334	.147	.755
7	Cipla Ltd.	0.000	1.713	0.000	.359	.749	.002	.993
8	Coal India Ltd.	0.000	1.844	0.010	.257	.831	.028	.919
9	Delta Corp Ltd.	0.004	2.234	0.244	15.825	.306	-1.756	.623
10	Dish TV India Ltd.	0.000	1.940	0.015	.644	.671	-0.042	.904
11	DLF Limited	0.000	2.149	0.000	1.077	.597	.008	.987
12	GAIL (India) Ltd.	0.007	1.784	0.398	.927	.511	-0.205	.531
13	GVK Power & Infrastructure Ltd.	0.001	2.017	0.083	2.045	.444	-0.178	.774
14	Hindustan Motors Ltd.	0.007	2.207	0.379	1.711	.441	-0.315	.540
15	Hotel Leela Venture Ltd.	0.009	1.716	0.507	.236	.867	.232	.479
16	ICICI Bank Ltd.	0.000	1.966	0.025	1.024	.397	-0.044	.875

(Contd...)

17	IDBI Bank	0.004	1.428	0.254	1.526	.500	-0.263	.616
18	Infosys Ltd.	0.54	1.967	0.171	.528	.655	-0.112	.681
19	ITC Ltd.	0.025	2.062	1.470	0.506	0.526	-0.223	0.260
20	Jain Irrigation Systems Ltd.	0.000	1.667	0.004	0.959	0.600	-0.026	0.951
21	Jaypee Infratech Ltd.	0.023	1.288	1.377	1.251	0.714	0.926	0.245
22	Jet Airways (India) Ltd.	0.000	1.947	.023	1.575	0.507	-0.083	0.879
23	JK Tyre & Industries Ltd.	0.051	1.905	3.090	1.632	0.577	1.187	0.084
24	JSW Energy Ltd.	0.025	1.624	1.506	1.435	0.405	-0.487	0.225
25	Larsen & Toubro Ltd.	0.000	1.450	0.018	0.657	0.645	-0.044	0.895
26	Lupin Ltd.	0.000	2.077	0.020	0.510	0.690	-0.042	0.887
27	M & M	0.001	1.830	0.056	0.331	0.778	0.064	0.814
28	Mother son Sumi Systems Ltd.	0.000	1.355	0.002	2.076	0.288	0.021	0.963
29	Muthoot Finance Ltd.	0.011	1.800	0.642	1.736	0.719	0.378	0.426
30	Petro net LNG Ltd.	0.006	1.273	0.352	0.821	0.607	0.219	0.555
31	Pfizer Ltd.	0.060	2.268	3.718	-0.165	0.921	0.740	0.059
32	Power Grid Corporation of India Ltd.	0.000	1.526	.007	0.469	0.665	0.021	0.932
33	Prestige Estates Projects Ltd.	0.019	1.889	1.094	0.288	0.855	0.380	0.300

34	Raymond Ltd.	0.004	1.541	0.261	0.880	0.629	0.215	0.611
35	Reliance Communications Ltd.	0.088	1.391	5.574	-1.337	0.730	2.114	0.022
36	Shree Renuka Sugars Ltd.	0.007	1.599	0.392	1.924	0.451	-0.368	0.534
37	Sun Pharmaceutical Industries Ltd.	0.001	1.985	.029	0.572	0.666	-0.052	0.865
38	Sun TV Network Ltd.	0.007	1.899	0.414	1.336	0.456	-0.266	0.523
39	Suzlon Energy Ltd	0.039	1.564	2.373	0.660	0.814	0.998	0.129
40	Syndicate Bank	0.025	1.691	1.462	0.400	0.858	0.623	0.231
41	Tata Consultancy Services Ltd.	0.001	1.748	0.060	0.628	0.625	-0.073	0.807
42	Tata Motors Ltd.	0.021	1.809	1.230	1.098	0.458	-0.378	0.272
43	Tata Steel Ltd.	0.000	1.655	0.007	0.822	0.636	0.025	0.950
44	The India Cements Ltd.	0.002	1.697	0.132	1.462	0.521	-0.191	0.718
45	Thomas Scott (India) Ltd.	0.003	1.691	0.164	1.489	0.445	0.182	0.687
46	Titan Company Ltd.	0.004	1.696	0.215	0.983	0.591	0.196	0.644
47	TVS Motor Company Ltd.	0.002	1.379	0.092	4.276	0.89	-0.174	0.763
48	Vedanta Ltd.	0.008	1.723	0.470	1.626	0.448	-0.338	0.496
49	Vijaya Bank	0.013	1.863	0.777	0.159	0.911	0.291	0.382
50	Voltas Ltd.	0.007	1.559	.037	2.600	.249	-0.100	.848

Source : The values are obtained using SPSS output–14.0.

with variability of beta. The variability of beta ranges from 0.28 to 1.18. There are negative betas, which is rare in other markets also. Out of fifty, 22 stocks (i.e. 44 per cent) have a beta of less than one. These stocks have systematic risk as the market itself. It indicates that the systematic risk is priced. Indeed; the beta risk premium is positive in the market. It indicates that there is stock return from the market return depending upon the beta values and these stocks are considered to be defensive as their beta value is less than one. Out of fifty, 26 stocks (i.e. 52 per cent) have negative beta values. There are only two stocks whose beta value is considered more than one. These two stocks are considered to be aggressive.

As an illustration, we present the estimated regression line for one of the stocks, e.g. stock 17 (Table-2). The estimated beta coefficient for stock 40 is 0.926 which means that the increase in the return on the market portfolio of 1% results in an increase in return on stock 40 for 0.926 per cent, on average. The same applies for the decrease in return: a decrease in the returns on the market portfolio of 1 per cent leads to a decrease in the return on stock 40 for the 0.926 per cent.

Since the significance of beta at 5 per cent significance level is greater than alpha value i.e. 0.05 we cannot reject the null hypothesis. We fail to reject the null hypothesis and it leads to conclusion that we are accepting the null hypothesis. Accepting the null hypothesis signifies that beta is less than $R_m - R_f$.

As is evident from the Table that constant is positive for all stocks barring two stocks. It indicates that there is stock return from the market return while the market trend is upward Constant is significant at 5 per cent significance level in all stocks (Table-2) Therefore, we cannot reject the null hypothesis and if it fails to reject the null hypothesis that we accept it. Accepting the null hypothesis produces evidence that the constant is equal to risk free rate. According to which constant is different from the risk free rate of return $y_o \neq r_f$ because the constant signifies that the excess stock returns on the excess market return are positive for assets with low and negative betas during the observed period and constant is negative for assets with high betas. For example, the stock namely 1 whose beta is high and its constant are negative.

The average coefficient of determination in all 50 regressions is 59.9 per cent. This account for 59.9 per cent of the variation in stocks returns. In our case, this measure has its economic interpretation, showing the relative significance of systematic risk for each stock.

The variance of the sample stocks is found to be on an average 59.9 per cent due to systematic risks and 40.1 per cent due to unsystematic risks. This means that 40.1 per cent variation in return cannot be explained by the market return alone. Therefore there must be other variables that have an influence also.

It is inferred from the analysis that the relationship between risk and return of the stocks is linear as the Y_0 is greater than risk free rate and Y_1 is less than beta premium. Hence, the result of the current study is in line with the CAPM hypothesis.

Research Implications

This paper mainly helps the investors to choose the stocks which are under-priced and overpriced either to invest in or to offload the holdings. It may also help the company and financial institutions to evaluate the investment alternatives in capital budgeting and cost of capital. Further it would help the fund managers in evaluating the performance of the schemes. The use of beta in assessing the systematic risk helps the investing community to take wise decisions about what are the macro and micro economic factors affecting stocks to move up and go down in the market so that they are able to achieve their investment objectives. The systematic risk helps the investors to guess about the stocks which are untapped in the market as well.

Scope for Further Research

Since the constant in the model remains positive and significant multi factor models are the natural extension of further study. The systematic risk measured by sock beta is statistically significant and that can be used in a wide range of applications of the CAPM model. There is also scope for the use of betas in the Indian capital market to estimate the required rate of return on securities, to estimate the discount rate used to discount cash flow in capital budgeting and measuring the performance of portfolio management.

Conclusion

The results show that the stocks with higher risk have higher return. The parameter with beta coefficient is positive and Y_1 is less than R_m-R_f. Hence, the first hypothesis (i.e. constant (Y_o) is equal to risk free rate) is accepted. This paper does not exclude the possibility of other sources of risk that affect the dynamics of return. In overall the variation in stocks returns cannot be explained by market return alone to the extent of 40.1 per cent due to other factors influencing on the stock return.

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Asset Management Efficiency in Maharatna Central Public Sector Oil Companies in India during the Post-liberalization Era : An Empirical Assessment

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The Central Public Sector Enterprises (CPSEs) have been a strategic lever for India's economic development in post-independence periods. Since liberalization, CPSEs have been exposed to competition from domestic and multinational corporations and has to reorient business strategies and benchmark their performance with the best practices prevailing in the global environment. A large number of studies have been carried out on the analysis of financial performance of Indian public sector enterprises in which along with other aspects of financial performance the efficiency of asset management has been considered. However, in the post-liberalization period the issue connected with efficiency of assets management of the companies belonging to the Maharatna oil sector has not been addressed with due importance. Moreover, the outcomes derived from the studies so far made on the current topic are contradictory in nature and therefore, the studies have not been able to provide any definite conclusion. Further no significant study has so far been conducted to deal with the same matter relating to the Maharatna oil companies in India in the recent times although these enterprises have been making remarkable contribution towards developing the Indian economy. The present paper attempts to make an analysis of Maharatna oil companies in respect of the efficiency of their assets management during the period 2004-05 to 2016-17.

Keywords : Maharatna, Lever, Liberalization.

Introduction

A company usually utilises its fund in two ways : (a) by making investment in fixed assets and (b) by making investment in working capital. So the value generating capability of the company largely depends on the efficiency with which fixed assets and working capital are managed. In other words, we can say the success of a company stems from the skilful utilization of its funds. Generally in manufacturing concern, inventory, receivables and cash are the most vital components of working capital. So the efficient management of long-term as well as short-term assets is recognised as an integral component of the overall

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corporate strategy to create shareholder's value. In fact, efficiency in asset management facilitates the owners' wealth curve soaring upwards.

The Central Public Sector Enterprises (CPSEs) have been a strategic lever for Indian economic development in both the pre-independence and post-independence periods. In fact, the growth story of India has strong roots in the form of contributions made by the CPSEs over the years. The CPSEs have emerged as the medium through which cherished goal of balanced economic growth, wealth creation for all sections of people of the country, inclusive growth and sustainable environmental practices are being facilitated. Over the years, the CPSEs have grown not only in number but also in the array of activities such as manufacturing, engineering, steel, heavy machinery, textiles, pharmaceuticals, petrochemicals, power etc. The opening of the economy has changed the market dynamics with private sector playing greater role in shaping the industrial landscape. As a consequence, the CPSEs have been exposed to competition from domestic and multinational corporations. Some CPSEs have been able to reorient their business strategies and benchmark their performance with the best practices while others have failed to do so. The central government has identified the profit-making CPSEs and empowered

them by granting operational and financial autonomy in order to equip them to react proactively to market forces. After assessment based on selected criteria, CPSEs have been awarded the status of 'Maharatna', 'Navaratna', 'Miniratna-Category I' and 'Miniratna-Category II' by the Department of Public Enterprises, Government of India, thereby granting enhanced powers. On 24th December 2009 certain CPSEs had been conferred Maharatna status by Government of India. The principal objective of the Maharatna scheme is to empower mega CPSEs to expand their operation and emerge as global giants. A CPSE must satisfy the following criteria in order to enjoy Maharatna status : (a) The enterprise should have already have Navaratna status. (b) It should be listed in Indian stock exchange with minimum share holding as prescribed by SEBI. (c) Average annual turnover should be ₹20,000 crore or more in the last 3 years. (d) The average annual net worth of the company should be ₹10,000 crore or more in last 3 years. (e) The average annual net profit after tax should exceed ₹2,500 crore during the last 3 years. (f) The company should have notable global presence or international operations. Presently, there are eight Maharatna CPSEs. They are Bharat Heavy Electricals Ltd. (BHEL), Bharat Petroleum Corporation Ltd. (BPCL), Coal India Ltd. (CIL),

Gas Authority of India Ltd. (GAIL), Indian Oil Corporation Ltd. (IOCL), National Thermal Power Corporation Ltd. (NTPC), Oil and Natural Gas Corporation of India Ltd. (ONGC), and Steel Authority of India Limited (SAIL).

Several studies have been carried out on the analysis of financial performance of Indian Public Sector Enterprises in which along with other aspects of financial performance the efficiency of assets management has been considered. However, in the post-liberalization period the issue connected with the efficiency of assets management of the companies belonging to Maharatna oil sector has not been addressed with due importance. Moreover, the outcomes derived from studies so far made on the topic are contradictory in nature and therefore, the studies have not been able to provide any definite conclusion. Further, no significant study has so far been conducted to deal with the same matter relating to the Maharatna oil companies in India in the recent times although these enterprises have been making remarkable contribution towards developing the Indian economy. In this backdrop, the present paper attempts to make an empirical analysis of the Maharatna oil companies in respect of the efficiency of their asset management during the period 2004-05 to 2016-17.

The remainder of this paper is structured as follows : Section-2 narrates the objectives of the study. Section-3 is concerned with the methodology adopted in this study. In this Section-4, a brief profile of the Maharatna oil companies is presented. Section-5 discusses the empirical results. Section-6 provides concluding remarks.

Objectives of the Study

The objectives of the study are :

- To analyse the trend in efficiency of assets management of the Maharatna oil companies.

- To ascertain the status of the Maharatna oil companies in respect of the efficiency of their asset management.

- To assess the relationship between the efficiency of asset management and value generating capability of the companies under study.

Methodology

The study is based on the companies belongs to the Maharatna oil sector. The data of these companies for the period 2004-05 to 2016-17 used in the study were collected from secondary sources i.e. Capitaline Corporate Database of Capital Market Publishers (I) Ltd., Mumbai. The fixed assets turnover ratio (FATR), inventory turnover ratio (ITR), debtors turnover ratio

(DTR) and cash turnover ratio (CTR) are the most common measures of efficiency of fixed assets management, efficiency of inventory management, efficiency of debtors management and efficiency of cash management respectively (Fairfield & Yohn, 2001). While measuring the efficiency of Maharatna oil companies in term of asset management, these ratios were used to draw the inference from the study. Specifically, 'value added to capital employed ratio' (VACE) was used in analysing the value generating capability of the enterprises. While analyzing the data used in the course of the study, statistical tools like arithmetical mean (AM) standard deviation, (SD) etc., statistical techniques such as Pearson's simple correlation analysis, Spearman's rank correlation analysis, Kendall's correlation analysis and Ordinary Least Square (OLS) methodology and statistical test like 't' test were applied at appropriate places.

Maharatna Oil Companies – A Brief Profile

Bharat Petroleum Corporation Ltd. (BPCL) established in the year 1952 is one of the leading company in the petroleum sector in India. BPCL is engaged in offering motor spirit (MS), high speed diesel, liquefied petroleum gas (LPG), refining crude oil and marketing of various kinds of petroleum products. It operates through two segments i.e. downstream petroleum and exploration and production of hydrocarbons (E&P). It is engaged in production of liquid and gaseous fuels, illuminating oils, lubricating oils, greases or other products from crude petroleum and bituminous minerals. It is one among the rarest company which bears the ancient Sanskrit name for India (Bharat). BPCL is the modern oil refining and distribution company. It has 10,000 gas stations, a national network of kerosene dealers and more than 3355 LPG distributors. The company operates about 50 bottling plants and serves more than 41.2 million LPG customers across India. Considering its outstanding performance and tremendous contribution to the national economy, the Government of India has granted 'Maharatna' status to BPCL on September 12, 2017.

Indian Oil Corporation Ltd (IOCL) : India's largest company by sales with a turnover of ₹4,45,372 crore coupled with a profit of ₹19,106 core for the year 2016-17, IOCL produces petrol, diesel, LPG, auto LPG, aviation fuel, lubricants and petrochemicals, such as naptha, bitumen and kerosene etc. It is the leading Indian corporate in the fortune's 'Global 500' listing raked at the 168 in the year 2017 and it is ranked 1st in Fortune India 500 list for the year 2016. On November 16, 2010 the

company was formally conferred the Maharatna status by the Government of India.

ONGC : It is India's largest oil and gas exploration and production company. It produces around 77 per cent of India's crude oil and around 62 per cent of its natural gas. The company was established on 14th August, 1956 by the Government of India, which currently holds 69 per cent equity stake. It was conferred with 'Maharatna' status by the Government of India in November 2010.

Empirical Results and Discussion

An attempt was made in Table-1 and Table-2 to analyze the efficiency of asset management of the selected Maharatna oil companies using FATR, ITR, DTR, and CTR. In these Tables, for measuring the average values of FATR, ITR, DTR and CTR of the selected companies, AM and for ascertaining the consistency coefficients (CC) of these ratios, the ratio of AM to SD were used. For identifying the nature of trend in selected ratios of each of the companies during the study period, linear trend equations were fitted and in order to test whether the slopes of the trend lines were statistically significant or not, t test was used.

Table-1 shows that the highest mean FATR (6.29) was maintained by BPCL while it was the least (0.60) which was kept by ONGC. In respect of consistency coefficient of FATR, IOCL (7.53) captured the top most position and BPCL (6.50), ONGC (6.50) jointly hold the next positions. The linear trend equations as fitted to FATR series in Table-2 disclose that an increasing trend in FATR was observed in BPCL which was found to statistically significant during the study period while IOCL shows decline trend in same which was statistically insignificant and ONGC revealed a upward trend which was statistically not significant during the period under study.

The maximum mean ITR (15.81) was found in ONGC and the minimum mean ITR (9.34) was achieved by IOCL. While taking consistency coefficient of ITR as a basis of evaluation, IOCL (8.48) was considered as the most consistent whereas ONGC (5.56) was placed in the last berth. The trend lines fitted to ITR series reveal that in BPCL an increasing trend which was statistically significant was observed during the study period while IOCL and ONGC shows a declining trend which was found to be statistically significant.

The highest average DTR (70.09) was achieved by BPCL while it was lowest (13.51) in ONGC. Based on the consistency coefficient of DTR, BPCL (5.07) captured top most position

whereas ONGC (3.88) found place in the last berth. The linear trend equations fitted to DTR series indicate that in IOCL, and BPCL an upward trend in DTR was observed but the trend was found statistically significant in IOCL only while ONGC shows a declining trend which was statistically found not found to significant.

The maximum mean CTR (676.40) was maintained by IOCL and the minimum mean CTR (6.46) was found in ONGC. On the basis of the consistency coefficient of CTR, ONGC (0.96) proved to be most consistent performer whereas BPCL occupied the last rank. The trend line fitted to CTR series depict that all companies shows an increasing trend which was found to be statistically significant was observed during the period under study.

In Table-1 for the purpose of ascertaining the assets management efficiency status of the companies under study more precisely, a composite rank test, considering both the average of and consistency in the FATR, ITR, DTR, and CTR for the study period was also carried out. In this test, a process of ranking was used for arriving at a more comprehensive measure of efficiency in which AM values and other values of AM to SD ratio of FATR, ITR, DTR and CTR were combined in a composite score. The ultimate efficiency ranking,

based on the sum of scores of each company's separate individual ranking under AM and the ratio of AM to SD of the said efficiency ratios, was made on the principle that the lower the composite score, the higher the efficiency and vice versa (Sur, 2012). Table-1 discloses that based on the combined score, BPCL and IOCL jointly captured the top-most position in respect of assets management efficiency and followed by ONGC.

In Table-3, with a view to identify the factors making significant contribution towards the value generating capability of the companies under study, an attempt was made to ascertain the closeness of association between the assets management efficiency and value generating capability of the companies through correlation coefficients between the selected indicators (FATR, ITR, DTR, and CTR) and value generating capability measure (VACE) taking into consideration their magnitudes (i.e. by Pearson's simple correlation coefficient), ranking of their magnitudes (i.e. by Spearman's rank correlation coefficient) and nature of their associated changes (i.e. by Kendall's correlation coefficient). All these correlation coefficient were tested by t test. This Table shows that out of 9 correlation coefficients between FATR and VACE, 5 coefficients were positive of which 3 were found to be statistically significant

Table-1 : Average and Consistency Aspects of Efficiency of Managing Assets of Maharatna Oil Companies in India

Company	ITR			DTR			CTR			FATR			
	Average	CC	Rank	Average	CC	Rank	Average	CC	Rank	Average	Rank	CC	Rank
BPCL	13.72	8.37	2	70.09	5.07	1	507.00	0.54	3	6.29	1	6.50	2.5
IOCL	9.34	8.48	3	41.72	4.42	2	676.40	0.67	2	4.34	2	7.53	1
ONGC	15.81	5.56	1	13.51	3.88	3	6.46	0.96	1	0.60	3	6.50	2.5

Sum of the Rank based on Average	Ultimate Rank bsed on average	Sum of the Rank based on CC	Ultimate Rank based on CC	Aggregate of Ultimate Ranks	Final Rank of Efficiency of Assets Management
6	1	8.5	2	3	1.5
9	2	6	1	3	1.5
10	3	9.5	3	6	3

Source : Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd. Mumbai.

Table-2 : Trend Analysis of Assets Management Efficiency of the Maharatna CPSEs Oil Companies in India

Assets Efficiency Measure	FATR	ITR	DTR	CTR
Company	Slop of Trend Line	Slop of Trend Line	Slop of Trend Line	Slop of Trend Line
BPCL	0.178 (5.181)***	0.236 (3.025)***	0.226 (.264)	109.69 (2.182)**
IOCL	(-)0.005 (.148)	(-)0.117 (1.948)*	1.895 (7.331)***	119.021 (2.238)**
ONGC	0.006 (1.196)	-0.485 (4.242)***	(-).149 (.701)	0.706 (1.910)*

Source : Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd., Mumbai.

Figures in the parentheses indicate t values

Significance at 1 per cent level. ***

Significance at 5 per cent level. **

Significance at10 per cent level*

whereas 4 coefficients were negative which were not found to be statistically significant. It is theoretically argued that there is a positive relationship between efficiency of fixed assets management and value generating capability, though it may not hold good in the real world situation. The analysis of correlation between FATR and VACE reveals that in IOCL the outcome support the theoretical argument.

Out of 9 correlation coefficients between ITR and VACE, 3 coefficients were positive which were found to be statistically significant but no significant negative correlation between them were found. Generally speaking, the higher the efficiency of inventory management, the higher is the value generating capability. The correlation analysis assessing the relationship between ITR and VACE shows that in ONGC the outcome conforms to the generally accepted argument.

Table-3 also discloses that 6 correlation coefficients between DTR and VACE. Out of which 9 were positive and of which 3 positive correlation coefficients were

Table-3 : Analysis of Relationship between the Efficiency of Asset Management and Value Generating Capability of Maharatna Oil Companies of India

Correlation / Company	Correlation between FATR and VACE			Correlation between ITR and VACE			Correlation between DTR and VACE			Correlation between CTR and VACE		
	P	K	S	P	K	S	P	K	S	P	K	S
BPCL	-.460	-.317	-.435	-.329	-.163	-.279	.090	.048	.088	-.025	.299	-.433
IOCL	.074*	.097*	.160*	-.054	-.038	-.136	.700**	.517**	.676**	.368*	.153*	.239*
ONGC	-.244	.029	.016	.211**	.287**	.493**	-.132	-.096	-.080	-.031	-.019	-.027

Source : Compiled and computed from 'Capitaline Corporate Database' of Capital Market Publishers (I) Ltd., Mumbai.

'P' denotes Pearson's simple correlation coefficient.

'S' denotes Spearman's rank correlation coefficient.

'K' denotes Kendall's correlation coefficient.

** Significant at 1 per cent level.

 * Significant at 5 per cent level.

found to be statistically significant whereas no negative correlation coefficient between them was found to be statistically significant. It is a theoretical argument that higher the efficiency of debtors management, the higher is the value generating capability. The results obtained from analysis of correlation between DTR and VACE exhibit that in IOCL the outcome supports the theoretical argument.

Of the 9 correlation coefficients between CTR and VACE, 5 coefficients were negative and 4 coefficients were positive. Three positive correlation coefficients were found to be statistically significant. The positive relationship between efficiency of cash management and value generating capability is theoretically desirable. The analysis of correlation between CTR and VACE as reflects in Table-3 points out that only in IOCL the outcome reaches the desired result.

Conclusion

i) BPCL has captured the top-most position based on average score of FATR so it proved itself as the best performer while IOCL was placed first based on consistency score of FATR so it proved itself as the most consistent performer in respect of managing fixed assets during the study period.

Based on the same scale, ONGC showed the poorest performance in the same period. A notable increasing trend in the efficiency of managing fixed assets was observed in 33 per cent cases during the study period.

ii) Although based on average ITR, IOCL was placed in the last position, it however, proved itself as the most consistent performer in respect of managing inventory during the study period. A considerable downward trend in the efficiency of inventory management was found in 67 per cent of Maharatna oil companies whereas in the remaining 33 per cent showed an upward trend during the period under study.

iii) BPCL has captured the top-most position in respect both the average and consistency scores of DTR. Thus BPCL proved itself as the best performer in respect of managing debtors during the study period. Based on same scale, ONGC showed the poorest performance in the same period. A notable upward trend in managing debtors was observed in 33 per cent cases while the remaining failed to establish any notable trend in it during the study period.

iv) A significant increasing trend in efficiency of cash management was established in cent percent cases during the period under study.

vi) The analysis of composite scores based on the combination of average and consistency aspects of the selected parameters reveals that BPCL and IOCL jointly bagged the best award in respect of assets management efficiency and they were followed by ONGC during the period under study.

vii) Only in IOCL a strong evidence of positive relationship between the efficiency of fixed assets management and value generating capability, to which supports the theoretical argument, was noticed during the study period. It signifies that in 33 per cent of Maharatna oil companies the role played by fixed asset management in improving value generating capability was noticeable during the study period.

viii) In ONGC strong evidence of evidence of positive association between ITR and VACE was established. It reflects that in 33 per cent of Maharatna Oil Company's inventory management made significant contribution towards enhancing their value generating capability during the study period.

ix) A notable positive relationship between efficiency of debtors management and value generating capability was found in 33 per cent cases but no significant negative relationship

between them was observed in any case. So, strong evidence of favourable impact of debtors management on value generating capability in a substantial portion of sample companies was noticed during the study period.

x) Only in IOCL a noticeable positive relationship between efficiency of cash management and value generating capability was observed. It indi-cates that only in 33 per cent of the Maharatna Oil companies, cash management had made notable contribution towards enhancing their wealth generating capability during the period under study.

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Managing Women Talent in Indian Central Public Sector Enterprises

Priyanka Mishra & Shulagna Sarkar***

There is a strong link between diversity and productivity in an organization. By hiring a diverse team of qualified men and women, benefits of creativity and uniqueness can be reaped. Women employees' experiences can be used to increase the productivity and motivation levels. As long as women remain under-represented in leadership positions, gender inequality will continue. In order to boost India's economic growth, it is important to achieve diversity in managerial ranks by managing women talent. The present study outlines the Indian scenario of women talent in leadership position. Beginning with the government policies and our industries' new projects for the betterment of their situation, the study captures the views of different scholars regarding recruiting more women, developing supportive career models, providing child care options, organizational support for work life balance as well as the challenges faced by the organizations in managing the women talent. The study also discusses engagement of women leadership from international perspective. The study further highlights the cases of encouraging women in Central Public Sector Enterprises. Efforts of Maharatna CPSEs towards implementing women leadership driven activities have been documented in the form of cases.

Keywords :   Talent Management, Women, CPSEs, Gender Bias, Women Leadership.

Introduction

The Asia-Pacific region continues to lose between 42 and 47 billion dollars a year in GDP due to the lack of participation of talented women in the workforce. The looming talent shortage and the Indian government's goal to train 500 million skilled workers over the next ten years, implies that those companies wishing to remain competitive will need to tap into India's population of highly educated Indian women. As long as women remain under-represented in leadership positions, gender inequality will continue. As managerial ranks continue to become more diverse, more pathways will open for India's women, and this in turn will promote India's economic growth. (Catalyst, 2013).

Economic growth depends on the participation of a full labor force (including both men and women) and India's lack of gender balance in

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economic participation remains still one of the worst in the world. The International Labour Organization (ILO) ranks India 120th out of 131 countries examined for women's labor force participation rate, and the World Economic Forum rates India 123rd out of 134 countries. The 2010 workforce participation rate was 26.1 per cent for women in rural India, and only 13.8 per cent for women in urban areas. If women were given more opportunities in the workforce, India's GDP could jump another 4 per cent (Catalyst 2013).

Investing in women is investing in the future of India. While India is poised to be a superpower, its gender inequality is stalling India's economy and keeping it from reaching its full potential. Changes in the workplace and society take time, and India has been taking positive steps towards gender equality (Hewlett & Rashid 2010).

The objectives of the paper are :

- To study the Indian scenario of women talent in leadership position.

- To discuss case studies on the initiatives of Indian public sector encouraging women talent.

Need for advancing Women into Leadership

Literature suggests that the career of women and men are different due to developmental differences between them and due to societal factors. (Powell & Maneiro 1992). At the start of managerial careers, career motivation' and need for challenging jobs tend to be similar for men and women but their work experience with reference to receiving feedback, opportunities to interact and learn from bosses was much lesser. Also issues around child rearing and dual careers have a far higher impact on women's careers than they ever on men.Other conclusions based on work of O'Neil *et al* (2008) and other already existing literature around women and careers are as following :

- Women careers impacted by larger life contexts.

- Families and careers are central to women's lives.

- Women's career paths reflect wide range and variety of patterns.

- Human and social capital are critical factors for women's careers.

Companies should be building a culture that attracts, retains and promotes talented women. Firms need to recognize what the barriers to progression are, and devise practices to support women through critical periods of transition. These that do will create a compelling brand, and one which women as well as men will want to work for. Women

will also be more inspired to reach senior levels. There is an argument for catching and recognizing talent earlier on. There is no denying that the biggest attrition of professional women in business is when theystart families, and are faced with the choice of whether they should give up their career, put it on hold, or carry on and try to balance their work and family life (potentially to the detriment of all if they are not properly and correctly supported). Businesses need to be monitoring the points at which women "fall out" of the company, as a result of the extreme choices they have had to make.

Some clients are recognizing that they even have an issue with retention before parenthood, where women choose to leave and find either less "extreme" roles or more "parent-friendly" cultures in which to continue their careers. Initiatives that would make a differences are recruiting more women, driving career models supportive to women, difference are recruiting more women, driving career models supportive to women, providing childcare options, and organizational support for work life balance (Parke, 2012).

Advancement of Women in Indian Firms

Survey based research of male and female managers in India conducted by Gupta and Koshal 1998, found

inequity in pay in corporate India. It was also found most women cope with gender bias by accepting slower rate of advancement, challenging organizational policies or decisions on an individual basis, work harder to get what men have, and simply believing that gender-bias does not affect them. Male stereotyping, exclusion of women from informal communication network, commitment to family responsibilities, lack of business experience, and not being in the pipeline long enough are some of the barriers to women's advancement. To assist women advance on corporate ladder, both men and women agree that HRM practices need to be changed. Women need to get greater exposure to top management; they should be encouraged to engage in job rotation within the company, and should participate in career development programs. Companies also need to provide better child-care facilities, survey women more often, build mentoring programs for women and actively recruit women at senior level positions (Gupta et al, 1998).

Desai and Ghosh (2011) show how being economically productive enhances a woman's self-esteem explaining why women around the world willingly work, even at the cost of dual pressure and additional stress. However, this stress often results in detrimental effects on satisfaction with life and

work and adjustment in general. The top most needs for all working women today are social and organizational support. These include women friendly work policies - like flexible and work from home, cooperative home environment and assistance for housework, stress relief programmes like yoga, overall change of attitude towards housework. (Desai et al, 2011).

The future organizations should create a conducive environment where the workforce have members of diverse backgrounds and the members of these workforces should accommodate the views of others and applaud genuinely. Clearly, it is important for organizations to commit to diversity, to review targets and networks, and to find innovative ways of tackling bias. Even more critical to success is training and development, both in building the skills of assessors and encouraging managers to reflect on their own behavior. Without this missing link, it will be difficult for organizations to effectively translate their policies, procedures and targets into actions (Agrawal, 2012).

Research by Gupta and Haldar (2015) based on data from IT companies across India found determinants of female absorption in IT sector. The results reveal that a small company may provide its women employees a better work environment than a big organization. It also finds that the percentage and mobility of female employees in an organization depends on the location of the firm and not on the turnover or the total number of skilled employees in the organization. Of the three IT hubs covered in the study, Delhi-NCR and Bengaluru seem to do better than Kolkata, as companies there seem to have better gender-inclusive policies to ensure better upward mobility among female employees (Dutta Gupta et al, 2015).

Interviews of Indian women leaders from service, manufacturing and financial services in India revealed their positive experience in progression through the organization, despite a traditional culture that might have suggested otherwise. They have been successful owing to the interplay of organization and familial support, coupled with a strong personal drive to succeed (Nath D 2000).

Gupta and Saran 2013 conducted a study to compartmentalize the impact of economic liberalization in India, with reference to the forcer, shaping the opportunities and pathways for women leadership. The findings of this study based on the interviews of ninety women trendsetters across various leadership positions in corporate India affirm the significance of individual

factors like 'Zippie Orientation', 'Swaraj Orientation', 'Large Raho Orientation, organizational level factors like 'Walk with the Movers', 'Home away from home', the World' and also talked about family level influences. (Gupta & Saran 2013).

Since career centrality is a multidimensional concept (consisting of three dimensions : purpose based centrality, opportunity based centrality, and career satisfaction). Each dimension is studied for its impact on career persistence. Together, these observations suggest that Indian IT women persist in their careers when they experience career satisfaction and a purpose based centrality. and not because of opportunity based centrality dimension (Srinivasan et al 2013).

While women are making progress and fighting for their rights and the government is making many policies, our industries are assisting with new projects for the betterment of their situation. Despite the intense effort of many agencies and organizations, and numerous inspiring success stories, the picture is still disheartening. There is still a lot of work to be done against violence, harassment and inequality in our society. It can be possible by giving proper direction to women and through education, awareness raising, and patterns of socialization and causing general

behavior to change. There is, no doubt, that the government is taking several steps but women as a whole are not being benefited and if all women get empowerment irrespective of any region, religion, caste, class or age then they will be empowered in real sense, be it political, economic or social empowerment. Information and communication have been playing an increasingly important role in economic and social development of nations so our corporations should give more and more efforts to the society (Jatana & Crowther, 2007).

Though economics of women talent is an established fact, numbers at the top are not changing. In India, women make up 42 per cent of new graduates, but only 24 per cent of entry-level professionals. Of these, about 19 per cent reach senior-level management roles. Women hold only 7.7 per cent of board seats and just 2.7 per cent of board chairs (Financial Express, 2017).

Women leaders are missing across sectors. To gain momentum and drive change, women need to "lean-in" and they are doing so – at least more than before. But the work-life environment for women has not changed sufficiently for them to overcome the hurdles to join, stay and rise to leadership roles.

Table-1 : Extract of Literature- Review of Key Papers

Author, Year	Areas of Study
McKeen and Burke, 1994	Values and Organizational Initiatives (family friendly policies, timeoff work, career development programme, training and challenging work), Individual Demographic and Situational characteristics (age, marriage, children, income, household work, Job involvement, Career strategies, Supervisor support, Work overload, Satisfaction.
Ruderman et al, 1995	Fair promotion process
Mattis, 1995	Environment free of gender bias and discrimination, Early identification of high-potential women talent, Leadership development programmes including lateral moves, Line experience, Flexibility in arranging work and support for balancing work/life responsibilities, Senior management. Sponsorship and support for gender diversity goals.
Appelbaum et al 2003	Women's attitude and self-confidence, Women's work experiences, Woman's transformational style, Corporate environment.
Metz, 2004	Ambition, masculinity and adaptability. Senior management commitment for energized diversity effort, Tackling discriminatory attitudes in managers, Driving attitudinal changes in manager behavior and cultural norms, Individual level coaching, Formal networks and mentoring programs to help level the playing field, Talent reviews, Succession planning that incorporate diversity and advance high potential women, High visibility assignments, Work life balance and flexibility initiatives.
Crowley and Weir, 2007	Support to balance career and children (Spouse, child-minder, state child care), Social capital, Opportunistic mindset, Opportunities and choices available to women.
Ezzedeen and Ritchey, 2009	Value system (hard work, passion/integrity/luck, serendipity, good fortune/ continuous learning/tenacity/risk taking), Family Support (supportive parents, in laws/friends/mother-father, spouse), Professional/Social support (peers/education, experience/mentors/supervisor, organization), Life course strategies (outsourcing, navigating partner support, career shifts, family before career, parenting, career before family, Slowing down of advancement
Elizabeth F. Cabrera, 2009	Authenticity, Desire for challenge, Work life balance

(Contd...)

Evans, 2010	Organization support for balancing family responsibilities, Inclusion in informal networks, women role models, Senior leadership accountable for women advancement, Awareness of stereotyping and biases, Visible/ challenging assignments, General management or line experience, Organizational culture, Gender diversity agenda
Vander Broeck, 2010	Leadership competency frameworks, Talent management, Succession planning processes, Leadership development, processes, Women to leverage differences, Firms to be gender bilingual
McDermott and Flood, 2011	Using your drive to make the most of early life and career experiences, Developing personal strategies to attain balance, Undertaking the dual-strands of emotion-management, Knowing that you cannot do it along, Maintaining the substance of your leadership.

Literature reveals that hiring, retention and growth of women—all are a big challenge. Let us take hiring. When 42 per cent of new graduates are women, why are only 24 per cent of entry-level jobs held by them? Either women are being pressurized to opt out of the workforce or they are simply not being hired. Why is that so and what are the companies doing about it? In order to capitalize on the women talent, we need two things being, leadership commitment to gender parity and an inclusive culture along with gender equitable hiring practices.

Engaging Women Leadership : An International Perspective

Many leaders,while professing equal opportunity for all, still exhibit clear biases and preferences for having men in critical roles, with the belief that women cannot handle the same pressure. In these instances, all diversity policies and practices of the company will be a waste of time and effort for HR. So the leadership commitment has to go beyond setting visible targets and policy changes to having a clear purpose to build a culture that is as inclusive for women as it is for men.

"Diversity and inclusion should not only be a phrase on a piece of paper, it is a mindset and should be lived actively every day," said Claudia Marshall, Ikea distribution area manager, Northern Europe.

In 2014, Microsoft India launched Women in Tech, an initiative to train and mentor one million girls in a year, enable the next generation girls to find suitable careers in IT and accelerate their growth. UNDP with support from Ikea Foundation launched Disha— an initiative to make a million educated but underprivileged college girls employable. Companies can partner with

such programmes and gain access to a large pool of women talent. In 2015, Ikea Switzerland became the first company in the world to reach the highest level of gender equality certification from EDGE (Economic Dividends for Gender Equality) and Ikea globally has 48 per cent female managers. Ikea's gender-related philosophy is all pervasive in their business. It extends beyond their organizational wall to their vendors, suppliers and customers. There is no substitute for visible top management commitment to gender equity. But there are specific actions that are complementary to the leadership commitment.

Many studies have shown that the employees nowadays seem to value the quality of life more than the amount of salary they get (Vloeberghs, 2002). They also suggest that people want to have more control over their work and accord more meaning to it. They want a better work-life balance. As a result, says Chalofsky (2003), the best employers are not great because of their perks and benefits, but because of their organizational culture and policies that promote meaningful work, and a nurturing as well as supportive workplace.

Pleck's (1977) research suggests that family-to-work spill-over is stronger for women and the work-to-family spill-over is stronger for men. Family environment and work environment

are the two factors that contribute to the enhancement of complications or problems for employed women, and between the two, the non-job factors or family-related factors weigh more importantly for women (Joshi, 1990).

Gender differences exist in terms of work and family boundaries in almost every society and this has resulted in gender differences in the experiences of work-family interface (Rothbard, 2001). Even in developed countries in the West, especially in North America, sources of stress for women include role overload from paid work and family work, role conflict, pressures associated with child care and other family care, and aspects of spouse relationships, including dissatisfaction with spouses' contribution to family work (Lewis & Cooper, 1987; 1988). Research over a period of time and across cultures continues to document the persistent inequality in the allocation of household work within dual career families, even among couples with 'modern' ideologies and a commitment to gender equality at home and at work (Brannen & Moss 1991; Hochschild 1989; Sandqvist 1992).

The Indian Context

The growing number of educated women in India— who are now participating in the urban, organized, industrial sector in technical, professional, and

managerial positions—has been accompanied by a steady growth in dual career families (Komarraju, 1997). Research on career women in India shows that work and family dilemmas are often different from those reported by women in the West (Sekaran 1992). As compared to their counterparts in other parts of the world, Indian employees face a lot of difficulties in managing their work and life. Research conducted by Rout, Lewis and Kagan (1999) finds that women in India experience considerable pressure, in the morning before going out to work and after work, to do all that is necessary for the family. Komarraju (1997) notes that the relative absence of an infrastructure that provides a reliable supply of electricity, water, and time-saving, modern-day kitchen and other appliances, renders the performance of domestic responsibilities a burden, particularly for women in dual career families. In addition, inflexible working hours and the absence of childcare facilities constitute impediments rather than sources of support for employed mothers (Bharat, 2001). Though in urban India, things have started improving, yet they are not adequate.

Methodology

An effort has been made to discuss the cases of encouraging women in CPSEs. The employment pattern of women in Maharatna PSEs has been studied using secondary data. Efforts of organizations towards implementing women leadership driven activities has been documented in the form of cases.

Women Employment in CPSEs : The ratio stands in stark contrast to the national average for women's participation in the labour force 28 per cent, as per the latest report from the World Economic Forum. Despite decades of platitudes and rhetoric on the subject of women empowerment and gender equality from successive governments at the centre, data released by the Department of Public Enterprises (DPE) in March shows that the percentage of women employees in Central Public Sector Enterprises (CPSE) in the country stood at an abysmal 9.36 per cent in 2015-16 (Indian Express, 2017). According to the Public Enterprises Survey 2015-16, a DPE initiative document the CPSE performance, that number has stayed stagnant between 9 and 10 per cent mark for the last four years.

The ratio stands in stark contrast to the national average for women's participation in the labour force—28 per cent, as per the latest report from the World Economic Forum. While human resource experts point out that this might be a few percentage points lower if the unorganised sector is excluded, they

say CPSE performance in this regard is still "unimpressive". And, CPSEs are cognizant of the situation. *"I acknowledge that it is below average,"* admitted U D Choubey, Director-General of the Standing Committee of Public Enterprises (SCOPE), the apex body representing PSEs. "But it has been improving gradually over the years and we (PSEs) are trying to do better." However, the percentage over the last three years has fallen, albeit marginally—from 9.81 per cent in 2013-14 to 9.45 per cent in 2014-15 to 9.36 per cent in 2015-16. The latest numbers show that CPSEs employed only 1,15,318 women last financial year—a fall of 12.83 per cent in three years. In contrast, total employee count fell just 8.6 per cent during the same period.

"There are many reasons for this. Many of these PSE employees were first recruited in the 70s and 80s. Women participation was generally low then. Those added later were only replacements, in naturally lower numbers" pointed out Aditya Mishra, chief executive of CIEL HR Services. "Another factor is that many CPSEs are in the technical and heavy engineering sector, where there is a heavy skew towards men."

The personnel and recruitment policies in respect of appointments against below Board level posts are formulated by the management of respective CPSEs. Like in other sectors, women are employed in CPSEs also and their percentage of employment is about 10.20 per cent as on 31.3.2017. The number of women employees in operating CPSEs in different groups/level such as managerial/executive level, supervisory level and workmen/clerical level during the last three years is shown in the Table (below).

It is evident from the above Table that women employment in CPSEs during the last three years has been hovering around 10 per cent roughly. CPSEs has the provision to provide maternity benefits to eligible women employees as per Maternity Benefit Act (1961). Also, the CPSEs have formed Internal Committees in respect of implementation of the Sexual Harassment of Women at Workplace. (Prevention, Prohibition and Redressal Act), 2013.

Oil & Natural Gas Corporation Ltd

Women employees constituted over 6.6 per cent of ONGC's workforce. During the year, programmes on women empowerment and development, including programmes on gender sensitization were organized. ONGC actively supported and nominated its women employees for programmes organized by reputed agencies. Disclosure under the sexual

Table-2 : Employees in Central Public Sector Enterprises

Type of Cadre	Total Employees			Total Female Employees			Female Employees as % of Total		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
Managerial/ Executives	2,64,497	2,62,665	2,64,648	26,661	27,010	28,631	10.08	10.28	10.82
Supervisors	1,30,208	1,17,487	1,04,404	9,506	8,297	10,308	7.30	7.06	9.87
Workers	8,96,469	8,03,681	7,60,209	85,907	80,011	76,299	9.58	9.96	10.04
Total	1,29,1174	1,18,3833	1,12,9261	1,22,074	1,15,318	1,15,238	9.45	9.74	10.20

Source : Compiled by Authors –Government of India (2014-15, 2015-16 & 2016-17) PE Survey Reports, New Delhi, Department of Public Enterprises.

Table-3 : Number of Employees with Maharatna CPSEs during 2016-17

Name of the CPSE	Total Number of Employees	Number of Women Employees	Percentage
Oil and Natural Gas Corporation Ltd.	33,600	2208	6.57
Indian Oil Corporation Ltd.	33,135	2,735	8.25
GAIL (India) Ltd.	4,355	257	5.9
NTPC Ltd.	20,593	1330	7.74
Coal India Ltd and its Subsidiaries	310016	–	–
Bharat Heavy Electricals Ltd.	39,821	2,251	5.65
Steel Authority of India Ltd.	82,964	4,782	5.76
Bharat Petroleum Corporation Ltd.	12,484	1139	9.12

harassment of women at workplace policy (prevention, prohibition & redressal) Act, 2013. The company has in place an Anti-Sexual Harassment Policy in line with the requirements of the sexual harassment of women at the workplace (Prevention, Prohibition & Redressal) Act, 2013.

Internal Complaints Committee (ICC) has been set up to redress complaints received regarding sexual harassment. All employees (permanent, contractual, temporary, trainees) are covered under this policy. The following is a summary of sexual harassment complaints received and disposed of during

FY'17: No. of complaints received : 02, No. of complaints disposed of : 02. The total manpower strength as on 31.03.2017 was 33,660.

Indian Oil Corporation Ltd. (IOCL)

The employee strength of the IOCL was 33,135 as on 31.03.2017, consisting of 16,545 executives and 16,590 non-executives. This includes 2,735 women employees comprising 8.25 per cent of the total work force. IOCL is committed to diversity and inclusiveness and has, therefore, adopted various practices to achieve women's development and gender equality in the organisation. Women employees have equal opportunities, equal rights and equal responsibilities. Congenial work culture of IOCL continues to inspire women employees to shoulder higher responsibilities in various verticals of the corporation. Under the Forum of Women in Public Sector, WIPS cell have been formed across IOCL, which focus on all-round development of women in the corporation and render necessary support required by women employees. As part of its commitment to the development of women, IOCL has been organising various training programmes on topics such as leadership skills, health & safety, work life balance, gender sensitivity, etc. The corporation's efforts in women

development have won recognition of WIPS as the best enterprise for women development for initiatives undertaken during the year 2016.

IOCL is committed to prevention of sexual harassment of women at workplace and takes prompt action in case of reporting of such incidents. In this regard, internal complaints committees have been constituted at various offices of the corporation to deal with sexual harassment complaints, if any, and to conduct enquiries. There were four complaints of sexual harassment, which were pending as on 1st April, 2016. During the year, seven complaints were received and five complaints were disposed of. As on 31st March, 2017, six complaints are pending, out of which four are pending for more than 90 days. Regular workshops are held for employees, especially women, to enhance awareness about their rights and facilities at the workplace as well as the rights available to them under the Act. During the year, 32 workshops/awareness programmes were conducted.

IOCL provides equal opportunity as an employer, where no discrimination is made on the basis of gender, color, caste or creed. There are various forums, where women employees are encouraged to represent the organization. To promote gender sensitivity and to

improve transactional relationship, workshops and training programs are conducted regularly through domain specialists across its establishments.

IOCL extends various types of special leaves to its women employees viz. maternity leave, husband joining leave, child care leave and child adoption leave, etc. An online portal by the name "Maitri" has been developed for the women employees of the refineries division, who can take part in various discussions, as well as raise concerns. All the women employees of IOCL are part of the women centric forum WIPS (Women in Public Sector). Various training programs are organized on topics ranging from self-defence, awareness on sexual and work-place harassment to stress management and organizational behaviour from time to time.

GAIL (India) Ltd.

Total employees 4,355 and women employees are 257.

Sexual Harassment of Women at Workplace : GAIL has in place a policy on Prevention, Prohibition and Redressal of Sexual Harassment of Women at workplace in line with the requirements of the Sexual Harassment of Women at the Workplace (Prevention, Prohibition & Redressal) Act,

2013. The Internal Complaints Committee (ICC) has been set up to redress complaints received regarding sexual harass-ment. During the year 2016-17, 3 (three) sexual harassment complaints were received and the same were disposed of.

GAIL women cell has been established to look after the developmental needs of women employees. The cell focuses on reaching out to the women workforce, initiate discussions and adequately address their concerns including discrimination and sexual harassment at workplace. GAIL remains committed to equal rights for all gender and the same is reflected in their compensation policy for employees. Minimum wage requirements in accordance with the applicable norms in each state where of GAIL's operations are also ensured.

NTPC Ltd.

Total number of employees : 20,593 and women employees are 1,330 (7.74 per cent)

NTPC has in place a policy on Prevention, Prohibition and Redressal of Sexual Harassment of Women at Workplace in line with the require-ments of the Sexual Harassment of Women at the Workplace (Prevention, Prohibition & Redressal) Act, 2013. Internal Complaints Committee (ICC)

has been set up to redress complaints received regarding sexual harassment. All employees (permanent, contractual, temporary, trainees) are covered under this policy. These ICCs have been constituted at all projects/stations also. Every three years, the constitution of these committees is changed and new members are nominated

Coal India Ltd.

In Coal India Ltd. there is a forum for women in public sector cell at company headquarter-Kolkata and subsidiary companies. Each WIPS cell is headed by a coordinator who plans and executes various activities of the forum with the help of a duly appointed executive committee. The company extends active support to the various activities of WIPS comprising of welfare activities. training & development activities, seminars, cultural programme, industrial awareness visits, health awareness programme, etc. for the WIPS members, women workers, their families and society at large.

Coal India Ltd and its subsidiary companies are extending full-fledged support and patronage to the national conference of forum of WIPS held every year in the month of February. In recent years, the WIPS cell have done commendable work in reaching out to the grass root level women employees, empowering them by suggesting

gainful redeployment, training and uplifting their morale by recognizing outstanding achievement, recognizing and honouring the exceptional talent.

Sexual Harassment of Women at the Workplace : The company has Anti-Sexual Harassment Policy in line with the requirements of the Sexual Harassment of Women at the place workplace (Prevention, Prohibition & Redressal) Act, 2013. Internal Complaints Committee (ICC) are working at every subsidiary and the office of Coal India Ltd. to redress complaints regarding sexual harassment. All women employees (permanent, contractual, temporary, trainees) are covered under the said policy. No sexual harassment complaint was received during the year 2016-17.

Total employees of Coal India Ltd. and its subsidiaries was 3,10,016 as on 31.3.2017.

Prevention of Sexual Harassment at Workplace : Sexual harassment of any form of misconduct under the conduct discipline and appeal rules applicable to executive cadre employees as well as in the standing orders applicable to the non-executive cadre employees. Internal Complaints Committee (ICC) is functioning at all levels in the company under the sexual harassment of women at work place (Prevention, Prohibition and Redressal Act, 2013.

Bharat Heavy Electrical Ltd

An Act to provide protection against sexual harassment of women at workplace and for the prevention and redressal of complaints of sexual harassment and for matters connected therewith or incidental thereto called "The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013", has come into force from 9th December 2013 with notification of rules by Government of India, Ministry of Women and Child Development called "The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Rules, 2013".

The provisions of the Act and the rules thereon are being strictly complied with. In accordance with the Act, Internal Complaints Committee (ICC) has been constituted in all units of BHEL and their constitution and contact details have been hosted on unit's website. Posters highlighting the key provisions of the Act, duties of the employer, complaints redressal mechanism, action for malicious complaints and various misconceptions about sexual harassment have been displayed at conspicuous places in all units in Hindi, English and regional languages. Five workshops were conducted by corporate office for ICC members across units through video conferencing. At the unit level, 41 workshops/awareness programmes were conducted on gender sensitization, self-defense and awareness about the Act. In addition, women employees are nominated for programs conducted by outside agencies on sexual harassment.

The total number of regular employees as on 31-03-2017 : 39,821 and number of permanent women employees as on 31-03-2017 : 2,251

Steel Authority of India Limited

Disclosure under the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 : The company has in place a system of Complaints Committees (under SAIL Conduct, Discipline and Appeal (CDA Rules, 1977) in line with the requirements of the sexual harassment of women at the workplace (Prevention, Prohibition and Redressal) Act, 2013. These committees have been set up to redress complaints received regarding sexual harassment. All employees of the company are covered under these Rules. The following is a summary of sexual harassment complaints received and disposed of during the year 2016-17 : Number of complaints received : 5, Number of complaints disposed of : 6, (including 1 pending of previous year).

Table-4 : Annual Report on Safeguard of Women at Workplace

1	Number of complaints received during the year 2016-17.	04
2	Number of complaints disposed of during the year 2016-17.	04
3	Number of cases pending for more than ninety days.	00
4	Number of workshops or awareness programme against sexual harassment carried out.	46
5	Nature of action taken by the employer on therecommendations of ICC	
6	2 Women, one Act apprentice and one regular employee, jointly submitted a complaint against a male employee. After detailed inquiry and ascertaining the misconduct, penalty was imposed by reducing the pay of the respondent by one stage for one year with cumulative effect w.e.f. 01/04/2017.	Case closed
7	An Act apprentice made a complaint against a male employee for using filthy and obscene words on phone with someone else when she was sitting nearby. On enquiry, the complaint was found to be true though the motive was not with the intention of hurting her. He realized his mistake and assured better behaviour. The Committee disposed of the case with a letter of warning. The respondent superannuated in March 2017.	Case closed
8	Complaint was made by a female security guard against a supervisor for using double meaning words. The respondent was transferred to another workplace and the case closed.	Case closed
9	The complaint received by ICC was of official nature and not amounting to sexual harassment. On examining the matter, it was found that it is not a case of sexual harassment, rather an official conflict. Counseling was provided and it was reiterated that if in future, employee faces harassment, she may give complaint in writing and action will be taken by ICC accordingly.	Case closed

Source : BHEL (2016-17) Annual Report, New Delhi, BHEL, Government of India.

As on 1.4.2017 total number of employees in SAIL : 82,964 (Executives-12840; Non-Executives - 70,124) and As on 1.4.2017, permanent women employees in SAIL : 4,782 (Executives-975; Non-executives - 3,807)

Conclusion

No country can make progress if it locks out a half of its population. Increasing contribution of women in the workplace would call for increasing contribution of men at home. Sheryl Sandberg said "A world where

half our homes are run by men, and half our institutions are run by women, would be a far better world!". Equitable hiring is fundamental to bringing men and women to the same footing. Only then shall a discussion about retention and growth of women at the workplace matter.

Biggest competitive advantage that CPSEs have by their side is the talent pool which exists currently with them; any pilferage would cost CPSEs dearly. During their operations, effective and efficient talent management which encompasses organizational goals, resources aspirations, training and deployability and technology enabling women at work are the key to drive sustenance and results.

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Selecting and Inducting Public Sector CEO in India : A Risk Management Perspective

J.P.Dash* & Devinder Kumar**

Leadership in public sector is critical to good public governance for transforming India to high growth and inclusive economy. The question remains, are the public sector leaders good enough? How can we ensure, the leader is selected rightly and inducted properly? The risk of making type I error makes the CEO selection a challenging task. This paper analyses current practice of selection and induction in the Central Public Sector Units and brings out various competency models for CEOs including generic Department of Personnel Training (DoPT) competency based dictionary and deliberates issues like right age of CEO, lateral entry vs internal promotion and past performance as a predictor performance. It outlines a model selection process and advocates for mentoring, bringing out some of the best practices in this field.

Keywords :   Public Sector, CEO, Selection and Induction, Risk.

Introduction

With a view to make India to occupy the space it deserves in the league of developed countries, both the government and business are developing several high-impact strategies and policies. No strategy or policy can achieve the transformation of the Indian economy without the right people, the right technical know-how, and the right mindset and behaviour, and most importantly, right leadership. Leaders, lie at the heart of economic growth, formulation of strategy and implementation thereof (Spencer, Rajah, Mohan and Lahiri, 2008). Selecting the best candidate for Chief Executive Officer (CEO) post and indoctrinating him/ her into the high-profile job is crucial to the success of any organisation, more particularly for the public sector.

Leadership in the public sector is especially important; it not only influences the job performance and satisfaction of employees, but also how government and public agencies perform. Leadership in the public sector is critical to good public governance, addressing market failures and promoting equity, setting model standards for the corporate in creating social impact.

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The question remains, are the public sector leaders good enough? INSEAD carried out a study of the best performing CEOs from 374 CEOs representing just over 200 companies in India. The study found no significant difference in the performance of CEOs of domestic private enterprises or Indian subsidiaries of foreign multi-national companies. On the other hand, CEOs of leading State-Owned Enterprises (SOE) were systematically ranked worse. Other things being equal, leading an SOE led to a drop of thirty five places in the ranking. The report says, the Indian state needs to provide a milieu at the top so that competent people can thrive and drive shareholder value (Insead, 2012). The need for public sector leadership is more important than ever for the aspiration of the nation and challenges arising from a volatile, complex, dynamic highly competitive business environment.

The various elements in the talent management process i.e. how a CEO is selected (Entry) and how a CEO is enabled to perform (Immersion) need to be deliberated at depth. This paper delves into the process highlighting the risk involved in each of the steps, bringing out solutions andideas. The paper also limits its scope to selection and induction of CEOs of Central Public Sector Enterprises (CPSEs) excluding banking sector. While the paper borrows

some of the universal principles applicable, irrespective of whether in public or private sector, other recommendations are specific to the public sector considering its unique context. This paper, drawing from secondary research, would attempt hands-on guidelines for the boards to aid them in selection and induction of the CEOs from a cross-section of research amidst various trade-offs in decision-making such as the right age of CEO at entry, lateral entry vs internal promotion and selecting a relevant competency model, in the Indian public sector context.

Public Sector Organisation and Need for Leadership Studies

Public management differs from corporate management in several important ways (Bower, 1977). Public sector managers frequently must accept goals that are set by organizations other than their own, operate structures designed by groups other than their own, work with people whose careers are in many respects outside management's control and accomplish their goals in less time than is allowed for corporate managers.

In a state-led mixed economy, where public sector took the centre stage in many sectors, Indian Public Sector Undertakings (PSUs) have shaped the economic, social, and political developments, with specific focus on regional development. With the

constraints of private capital, the public sector was seen crucial for establishing self-reliance, regional balance, equal employment opportunities and infrastructure development (Jain, Gupta, & Yadav, 2014). However, the Indian PSUs have been criticized for lack of efficiency, corruption, and poor quality of services (Khatri, 2016). Especially in a developing country like India, where their social and economic importance and impact factor is high and society needs inclusion and growth, they need more attention than that has been given in research till date (Gupta & Khatri, 2018).

Public sector leadership research has experienced neither the volume nor the integration of the mainstream (Wart, 2003). Compared to the bulk of research on leadership in private companies, studies on leadership in public sector have been somewhat limited (Gupta, 2016; Gupta et al., 2018). Hansen and Villadsen (2010) conclude that compared to other disciplines, "leadership theory has generally received little attention in public management research". Orazi, Turrini, and Valotti (2013) suggest public sector leadership to be a distinctive and autonomous domain emerging in public administration/public management studies despite little attention to the same in business administration studies.

While findings on public sector from research studies in Western countries may be applicable to India to a limited extent, the uniqueness of Indian political, social, economic, and cultural context demands research studies of Indian public sector undertakings in their own right. Researchers Gupta et al., 2017; Khatri, 2011, 2016; Orazi et al., 2013; Roberts, 2017; and Siugzdiniene, 2006 have noted that leadership styles depend more on contextual factors of social and cultural and environment of the public sector organization. It calls for country-wise studies on private and public sector leadership.

Expectations from the Public Sector and the CEOs

Government and business leaders across the world are facing the challenge of rising geopolitical uncertainty and a more connected, yet in many ways more divergent, world. In this changing environment, public sector leaders can do more to help business and society by :

• Committing to a renewed focus on delivering fiscal sustainability, with a spotlight on re-defining purpose and with a zero-based approach to strategically managing both costs and assets.

- Delivering digitally-led public body which is both agile and resilient to change.

- Building the foundations for a long-term, sustainable (good) growth with a focus on the key levers of skills, infrastructure and tax.

- Collaborating to reduce the geopolitical uncertainty that hinders the confidence to invest, drive good growth and create good jobs (PwC, 2016).

As the world tries to cope with rising tensions, together business and government can deliver what citizens really want by putting good growth and good jobs at the heart of the mission and the mandate of public bodies. In today's globalised world, the challenge remains for public sector organisations to 'do more for less' and strategically manage their costs in the face of budgetary pressure and ever increasing demands on public services. In addition, there is a need to build digital capability of public sector organisations as well as the agility and resilience to cope with future (PwC, 2016).

The 19th Annual Global CEO Survey by PwC looked at the ways in which CEOs are redefining business success. The survey found, around three quarters (76 per cent) of CEOs agree that in future business success will be defined

by more than just financial profit; and many agree that they should be doing more to measure and communicate their impact on wider stakeholders. The starting point for CEOs is to redefine success fundamentally such that creating societal value is part and parcel of a profitable enterprise (PwC, 2016). Thus, inclusion, equity and societal value in triple bottom line performance are even more important for the public sector leaders in the emerging context.

A significant difference for public sector CEOs is, who they see as having the biggest impact on their organisation's strategy. In contrast to the private sector, where the customer is king, government and regulators have a 'high' or 'very high' impact for 87 per cent of public sector CEOs. Public sector CEOs are of the view that government and regulators have a 'high' impact for 41 per cent of them and a 'very high' impact for 45 per cent. Nevertheless, for 53 per cent of public sector CEOs surveyed view that customers and clients still have a very high impact (PwC, 2016).

CEO is the orchestra conductor in a company environment. CEOs make sure all the instruments are playing in synchronism to make the proper sound, and that the orchestra has the right instruments being played. With a capable leadership of CEO, orchestra

creates sound of harmony or else it causes cacophony resulting in destruction of value of the company. Leadership in any organization is important, but developing good leaders in the public sector is especially crucial.

C-suite roles are challenging and often high-profile. The CEO is responsible for the success or failure of the company. Operations, marketing, strategy, financing, creation of company culture, human resources, hiring, firing, compliance with safety regulations, sales, public relation, etc.—it all falls on the CEO's shoulders. The principal component of a CEO's job description covers; setting strategy and direction, modelling and setting the company's culture, values, and behaviour, building and leading the senior executive team and allocating capital to the company's priorities.

The OECD defines also the role of public leaders as "to solve the problems and challenges faced in a specific environment. When we say we want more leadership in the public sector, what we are really looking for is people who will promote institutional adaptations in the public interest. Leadership in this sense is not value neutral. It is a positive espousal of the need to promote certain fundamental values that can be called public spiritedness" (OECD, 2001).

In the public sector, CEO can mean the CMD where the Chairman and Managing Director role are merged into one, or it can be Chairman or Managing Director. This paper also examines selection and induction for Executive Director or Functional Director or anybody playing a role in management of the board by other designation, but playing similar role.

In the Harvard Business Review article titled, "What Sets Successful CEOs Apart", it is brought out that high-performing CEOs don't distinguish themselves by regularly making great decisions. They stand out for being more decisive, making decisions earlier, faster, and with greater conviction and consistency, whereas high IQ executives struggle with decisiveness – make slow decisions that frustrate teams and lead to attrition of talent. They do not wait for perfect information to make the perfect decision. This study points out that wrong decisions are often better than no decisions, as teams need direction and teams lose faith in leaders who waffle or backtrack (Lytkina, Kim Kincaid and Wang, 2017). Four key behaviors for successful leaders are : 1) Deciding with speed and conviction; 2) Engaging for impact; 3) Adapting proactively; and 4) Delivering reliably (Lytkina, Kim Kincaid & Wang, 2017).

Risks

The role of CEO as institution builder is different from that of his previous experience. One can be a good player, but can fail to be a good captain. Similarly, a good captain need not be a good coach. Choose the right one and everything else will be easier. Choose the wrong one, it can be a catastrophe.

While recruiting, one can make either a type I or II error. While a type I error (or error of the first kind) will lead to incorrect rejection of a true null hypothesis, a type II error (or error of the second kind) is the failure to reject a false null hypothesis. In terms of false positives and false negatives, a positive result corresponds to rejecting the null hypothesis, while a negative result corresponds to failing to reject the null hypothesis; "false" means the conclusion drawn is incorrect. Thus a type I error is a false positive, which means, we assumed the selection to be great, however it turned out that the CEO on the job does not meet our aspiration. A type II error is a false negative, which means a CEO which is sidelined by our selection criteria eventually would have been a great CEO. In the case of PSUs, chances of type I error prevails over the type II error.

The cost of failure of wrong selection of CEO has significant financial, reputational and talent impact. This matter assumes serious consideration in view of the fact that CEOs appointed after 1985 are three times more likely to be fired than CEOs who were appointed before that year based on a study conducted by Rakesh Khurana, Dean of Harvard College, and Nitin Nohria, Dean of Harvard Business School. Moreover, 40 per cent of all executives who change jobs or get promoted fail in the first 18 months, a number that has remained steady for the past 15 years (Hauswirth, 2016). Thus, the Boards need to reassess their CEO succession processes and ensure that they are supporting their strategic goals. There is nothing more important for board members than selecting the organization's next leader.

The stakes of CEO selection require a process with commensurate rigor. Some of the most common missteps are elaborated below. First, the board may be too much dependent on perspective of the current CEO. As such, right people may not be involved in the selection. Second, although the board may be pretty good at understanding industry dynamics and financial and strategic planning, but it may not be good at accurately evaluating and assessing a potential CEO. The board may fail to examine in totality all aspects such as; successor's integrity, fit with the organizational culture, ability to inspire and energize the enterprise, and capacity

to develop other leaders. Third, the long duration of the selection process can change the job specification as market dynamics change. Moreover, if the specification is too rooted in the present and can include status quo assumptions, specification can be limiting. The specification for CEO job may not align with the organization's cultural and future requirement. Fourth, if there is lack of alignment in the board about differing perceptions of the strategy, it can derail the new CEO. Without unified board support, the successor can quickly fall into the trap of navigating conflicting mandates rather than delivering on the organisation's strategic goals (Hauswirth, 2016). These remarks are independent whether the CEO is heading a public sector or a private sector, whether he belongs to India or belongs to any other country.

Issues and Key Ideas for Change

In order to make the CEO selection perfect, we should know what exactly we are expecting from the CEO and what kind of competencies he/she should possess. There are a lot of variables that influence the selection of an outstanding CEO, like the right age for entry and past performance as a predictor for future. There are a lot of issues and trade-offs in CEO selection such as, lateral entry vs internal promotes,

and collaborating vs delegating in the search process. The following paragraphs delve into examination of such vital issues. The first issue of qualities of CEO is analysed from the general context, India specific expectations from future business leaders, attributes/qualifications of board members specific to public sector : and finally expectations from Indian public sector leaders.

The Qualities of a CEO

CEOs and diamonds are a lot alike. Most are flawed in some way, all are hardened and formed under crushing pressures and intense heat, and they are judged by the degrees of quality (Trammell, 2016). The following paragraphs first bring out expectations from CEO, then expectations from Indian corporate leadership followed by expectations from public sector leadership, and Indian public sector leadership.

The qualities of CEO set them apart; which are credibility, competence and caring attitude, as explained below (Trammell, 2016).

Credibility : Without credibility, people would not put their trust on the CEO. They may act out of compulsion of obeying some of the diktats, but apparently they will be against such diktats. Thus, they would put less energy into the strategic directions

outlined by the CEO. Ultimately, the organisation becomes a loser. CEOs, who lose credibility, can never regain it. To maintain credibility, not only they tell the truth 100 per cent of the time, but to every stakeholder the same version of truth every time. In bad times, if CEOs try to pretend, hoping that things will improve; all credibility with employees is lost. The first acid test that a potential CEO must pass is that of credibility.

Competence : The CEO's to deliver must be seen as not only credible but competent. The marks of competencies should be visible. CEOs need to show a deep understanding of the company's business model—how the product is bought and sold—as well as how the product is made or how the service is constructed and delivered. They need to show a willingness to learn and adapt. If the CEO is wrong, ill-informed or make poor judgments, he/she will make the ship of enterprise sink. The CEO may be sitting in the captain's chair, but every time he/she shouts an order, people will ignore it, as people know that he/she lacks understanding about the business. The second acid test that a potential CEO must pass is that of competence, which will be discussed at length subsequently.

Caring : People must believe in both the message and the messenger. Having

competence but not caring about people or the organization's mission will not take CEO very far. Caring is about showing that the CEO puts the organization above himself. The most common trust killer for CEOs is the belief that they do not have to follow the same rules or be held to the same standards of performance as the rest of the employees. Caring means applying the same standard to one as applied to others and communicating otherswith empathy. He/she let others go first. Be happy to give others the credit. During the time of crisis, he/she takes responsibility and does not start a blame game. In good times, he/she credits others, and empowers others. Thus the third acid test that a potential CEO must pass is that of caring attitude.

Moran (2018) in an article on 'How To Figure Out If You're CEO Material' brings out the essential skills, based on a research by Botello as follows :

Risk Tolerance : The ability to take calculated risks—and live with the potential fallout—is important for rising leaders. Not taking risks is the most dangerous thing to do on the way to the top.

Vision : Effective CEOs can see beyond the immediate needs and urgent matters and keep long-term goals in mind. As a CEO, he/she is no longer be in the weeds, but he/she is at the helm of the

ship looking out in the horizon, and looking around. That implies constantly staying abreast of what is happening in the industry, thinking about trends and developments, and analyzing what they mean for the future of the organization. The more CEO broadens his/her exposure to various content and context, and the factors, trends, changes and circumstances that affect the industry or the economy overall, the more he/she can connect the dots and see things others do not.

Reliability and Results Orientation
CEO must invariably be reliable. They should do it, if they say. Most people overestimate how dependable they are in the eyes of others. Since reliability is an essential component of trust, such a misalignment can be a problem in ascending to a leadership role. A focus on results is a component of reliability. When they are given a task, they take on with energy and enthusiasm, finding solutions to problems when they arise.

Adaptability : CEOs must be able to pivot and adjust to change. Highly adaptable leaders do not hide from reality. They face what's happening and use well-honed decision-making skills to make the best choices in any given situation.

Engaging for Impact : Effective CEOs craft a shared vision. Deliberate practices such as clear communication, positive body language makes CEO's engagement with people different. Emotional intelligence is a key part of their impact as a leader as well. Being able to "read" people and respond appropriately to them, make a difference to how the CEO makes an impact.

Although the attributes proposed by two different models remain valid irrespective of the company, company's status in business cycle, company specific factors like culture etc. needs to be built in finding a best fit between the requirement and attributes. This exercise is scientifically done through competency mapping and assessment.

Regardless of the sector, leaders and mangers hold a vital role in making organizations deliver results in changing times. In general, leaders carry critical responsibilities such as managing organizational change, developing the organizational culture, strategizing, and managing crises.

India Specific Expectations from Future Business Leaders

Conference Board (CB) 2014 identified the personal attributes required of future business leaders in India. The attributes are; courage, collaboration, self-awareness, comfort with ambiguity, humility, independent thinking, and integrity. The competencies identified are global mindset; cultural sensitivity;

and ability to lead change, to communicate and tell stories, to manage global virtual teams, to be a talent optimizer, to be a team and network builder and to listen and make the opinions of others (CB, 2014).

CB survey brings out the challenges before the next generation of leaders. The era of digital abundance delivers an overwhelming volume of information at dizzying speed. The next generation of leaders must understand that problems can be solved by expert networks outside the traditional internal employee domain and that others outside the inner corporate circle may have the best solutions. This will require future Indian leaders to become truly collaborative, be expert listeners, develop the ability to trust nontraditional partners, and seek solutions in non-traditional forums (CB, 2014).

The next generation of leaders should nurture a global mindset. In a borderless global economy, cultural competency and sensitivity matter more than ever. Globalization and regionalization are putting more pressure on business leaders in India, a country rich in cultural/regional diversity, thrusting them into often unfamiliar cross-cultural leadership situations. The next generation of leaders are those tri-sectoral leaders, who will

be able to move seamlessly through the public and private sectors as well as civil society. The ability to effectively network between these three overlapping spheres will be crucial (CB, 2014).

Attributes/Qualifications of Board Members Specific to Public Sector

The OECD State-Owned Enterprises (SOE) Guidelines recommends setting clear minimum qualification criteria for board nominations; vetting mechanisms for ministerial board nominations; establishing nomination committees or taking a tailored nomination approach; and ensuring shareholders' right to elect board members (OECD, 2018). It is interesting to note practices of various countries for selection of board level appointments.

In China, according to the regulations on state-owned assets of enterprises, directors are required to have professional knowledge and competency. Having a 'good character' is also one of the required qualifications.

In Korea, formal qualifications are stipulated in the Public Institutions Management Act. It states that candidates with good knowledge, experience, and competent ability necessary for performing his/her duties can be nominated as a director or auditor of the SOE.

In Malaysia, leadership experience, national and regional backgrounds are included in the criteria. At present, most of the SOE board members are retired professionals or public officials from the Ministry of Finance or relevant line ministries. Candidates are identified mainly through networking and word of mouth.

In Morocco, the board of directors of SOEs are required to be selected based on their professional competency and expertise, particularly in the technical, economic and financial fields relevant to the profile of the organisation according to the Moroccan Code of Good Governance Practices of the Public Enterprises and Establishments.

In Thailand, the State Enterprise Policy Office is charged with developing a profile of board skills called 'Skill Matrix' to identify its skills needs and potential members with appropriate knowledge, competencies and expertise, as indicated by the questionnaire responses by Thai authority. The qualification criteria to be considered for the pool include age, educational qualifications, relevant work experience and Thai nationality.

In Sweden, a high level of expertise is required in corporate governance, business operations, financial issues or other relevant areas. Furthermore, integrity and the ability to see to the company's best interests are required.

In Vietnam, specialty and management skill are a prerequisite qualification for board member nomination and the board is responsible for identifying its skills needs and communicating them to the relevant decision-makers.

Expectations from India Specific Public Sector Leaders

As per an IIM Ahmedabad study, Indian PSUs Leaders are driven by public-service motivation, job security and work environment. They face three key managerial challenges, political interference and lack of autonomy, rigid rules, standard HR practices, and lack of employee motivation. The top leader qualities, as per the study are; positive leader personality, communication skills, change and relation-oriented behaviors, HR skills, and decision-making (Gupta, Kulkarni & Khatri, 2018).

Age of CEO

Age is a leadership wild card as head-hunters and corporate boards ponder trade-offs such as energy vs. wisdom. Korn/Ferry's research finds that such traits as perseverance, integrity and trust have nothing to do with age. However, conflict management and negotiating skills improve over time. An experienced CEO might help a company avoid repeating mistakes, but

the flexibility of youth might be important in an environment of quick adjustments (Korn Ferry, 2017).

The eternal debate as to what is the right age for becoming CEO continues. There are some CEOs running major companies in their 40s and 70s, and those interviewed say that age has little to do with success and leadership. The median age for an S&P 500 CEO in 2007 was 55, according to executive search firm Spencer Stuart. If anything, companies are gravitating more toward the sweet-spot age of 55 (Korn Ferry, 2017).

The ordeal of CEO is tested in the cradle of pressure. Experience, which we correlate with age, is not about having more answers. It is about asking the right questions. Thus a younger guy can demonstrate better competency despite being less in age. Character and courage are more important than age. However, considering the context of the government, where risk avoidance is generally observed growing with age, it would be wiser to limit the age of entry level to CEO to 55.

Public Enterprise Selection Board (PSEB) specifies two years of residual service as on the date of vacancy pertaining to the date of superannuation for internal candidates and three years of residual service as on the date of vacancy related to the date of superannuation

for external candidates, age of super-annuation being 60 years. Thus, this age criteria need to be revisited and brought down.

Lateral Entry vs Internal Promotion

In a McKinsey paper 'What makes a CEO exceptional', the authors have presented their finding based on research from experiences of exceptional CEOs, those defined as the very top performers in their data set of roughly 600 chief executives at S&P 500 companies between 2004 and 2014. Exceptional CEOs were defined as CEOs who delivered more than 500 per cent growth in total returns to shareholders over tenure, normalized for performance of broader industry. CEOs, who are hired externally tend to pull more strategic levers than those who come from within and outperform their internal counterparts over tenure. Exceptional CEOs are twice as likely to have been hired from outside the company. (Birshan, Meakin, & Strovink, 2017).

It is interesting to note that 55 per cent of the exceptional CEOs were internal hires in the mentioned study. Clearly, insiders can move aggressively and achieve outstanding results. Doing so often means cultivating an outsider's point of view to challenge the company's culture with greater objectivity and overcome the organizational inertia that sometimes limits an insider's

span of action. A CEO selection process based entirely on internal talent is considered as a band-aid solution for a larger wound. In this context, comments of R.V. Shahi, Former-Secretary, Power, Government of India is apt. He observed that the institutionalised arrangement for selection should hold good only up to general managers. Beyond that, leadership positions should be open to everyone (Spencer, Rajah, Mohan & Lahiri, 2008).

Past Performance as a Predictor of Future

London School of Economics research has brought out that an individual's past performance plays a minor role for CEO positions in major non-financial firms by the search agencies. The international search firms choose candidates on the basis of more observable factors such as good references, their career path – whether the person has held one or more managerial posts and has had fairly clear upward progression – and the board's anticipated approval of them, what is called 'fitting in', rather than looking at past performance (Sangani, 2015). Currently, PSEB makes overwhelming emphasis on past performance, which needs to be revisited.

Competency Mapping

The performance of an employee is generally assessed based on technical /

operational parameters. However, the behavioural aspects of an employee play a very vital role in the employee executing the assigned goals, which is normally relegated to the background. With competency model, there is a well-rounded assessment of an individual by measuring and assessing the behaviour of employees.

Competencies have been defined in many ways. However, a practical definition of competencies that is easy to understand has been defined by Boyatzis of Hay Group. It states that competencies are those underlying characteristics of an employee – motive, trait, skill, aspects of one's social image, social role or a body of knowledge, which can result in effective and/or superior performance in a job or role' (DoPT, 2014).

In the National Training Policy (NTP) 2012, Government of India has brought out that competency will be the building block for all HR interventions. Further NTP 2012 brought out that "For moving to a competency-based approach, it would be necessary to classify the distinct types of posts and to indicate the competencies required for performing work in such posts. Once the competencies are laid down, an individual's development can be more objectively linked to the competencies needed for the current or future jobs. Career progression and

placement need to be based on matching the individual's competencies to those required for a post. The training plan of each ministry/department/organisation needs to address the gap between the existing and the required competencies and provide opportunities to the employees to develop their competencies."

A competency dictionary is a collection of competencies for an organisation or set of organisations from where competencies for specific jobs or roles can be identified. This competency dictionary could be applied to various human resource management functions such as training, recruitment, performance management, placement and promotions. The implementation toolkit provides detailed guidelines on how departments/organisations can apply this Competency Dictionary for HRM functions.

Various CPSEs, which have rolled out their competency models are; Rourkela Steel Plant (RSP), National Aluminum Company Ltd., (NALCO), Bharat Dynamics Limited, National Hydroelectric Power Corporation Ltd., National Thermal Power Corporation, Power Grid Corporation of India Ltd., and Tehri Hydro Development Corporation Ltd.

Hay group conducted a study to find competencies for successful Indian CEOs. It found the best Indian CEOs have competencies in four general areas : Socially responsible business excellence, energising the team, managing the environment, and inner strength (Spencer et al 2008). The three components of socially responsible business excellence are adaptive thinking, entrepreneurial drive and excellence in execution. The three components of energising the team are driving change, team leadership and empowerment with accountability. The three components of managing environment are networking, organisational awareness and stakeholder influence; the two components of inner strength are, executive maturity and transcending self. (Spencer et al, 2008).

DoPT Competency Dictionary Toolkit : The Department of Personnel and Training (DoPT) of the Government of India with the United Nations Development Programme (UNDP) initiated the project titled 'Strengthening HRM of Civil Service' in the year 2011. This project created 'Competency Dictionary' (Government of India-UNDP 2013), comprising of 25 core competencies across the various roles and positions of civil service employees in four categories: ethos, ethics, equity, and efficiency in Table-1.

Table-1 : Basket of Competencies and their Short Explanation

Competency	Definition
ETHOS	
1.1) **People first**	Passion for serving people with special care for the marginalised and disadvantaged. Being approachable, welcoming, caring and rising above bias while interacting with people. Understands the needs of the people and constantly strives to improve the services.
1.2) **Strategic thinking**	Ability to understand dynamic internal and external environment and its impact. Responds to the opportunities and challenges for the betterment of society.
1.3) **Organisational awareness**	Understanding of the organisation's mandate, structure, policies, processes, norms and its interface with other organisations. It also includes an understanding of the organisation's informal structures, power dynamics and constraints.
1.4) **Commitment to the organisation**	Aligns behaviours and interests with the needs and goals of the organisations.
1.5) **Leading others**	Ability to engage, energise, and enable the team to excel.
ETHICS	
2.1) **Integrity**	Consistently behaves in an open, fair and transparent manner, honours one's commitments and works to uphold the Public service values.
2.2) **Self-confidence**	Belief in own capability to accomplish a task and being able to express confidence in dealing with challenging circumstances without being arrogant or boastful.
2.3) **Attention to detail**	Having an underlying drive to being thorough and meticulous and to comply with procedures, rules, guidelines, and standards. Digs deeper and strives to reduce uncertainties and errors.
2.4) **Takes accountability**	Takes ownership for outcomes (successes or failures) while addressing performance issues fairly and promptly.
EQUITY	
3.1) **Consultation and consensus building**	Ability to identify the stakeholders and influencers, seek their views and concerns through formal and informal channels. Build consensus through dialogue, persuasion, reconciliation of diverse views/interests and trusting relationships.
3.2) **Decision-making**	Makes timely decisions that takes into account relevant facts, tasks, goals, constraints, risk and conflicting points of view.

(Contd...)

Competency	Definition
3.3) Empathy	Empathy is about being able to accurately hear out and understand the thoughts, feelings and concerns of others, even when these are not made explicit.
3.4) Delegation	Delegates responsibility with the appropriate level of autonomy so that others are free to innovate and take the lead.
EFFICIENCY	
4.1) Result orientation	High drive for achieving targets and competing against a standard of excellence.
4.2) Conceptual thinking	Understanding a situation or environment by putting the pieces together and identifying patterns that may not be obviously related. Connecting the dots while resisting stereotyping.
4.3) Initiative and drive	Contributing more than what is expected in the job. Refusing to give up when faced with challenges and finding or creating new opportunities.
4.4) Seeking information	An underlying curiosity to know more about things, people, or issue. This includes "digging" for exact information and keeping up-to-date with relevant knowledge.
4.5) Planning and coordination	Ability to plan, organise and monitor work with effective utilisation of resources such as time, money, and people.
4.6) Desire for knowledge	Keeps up-to-date with relevant knowledge and technology, share latest developments with others, and advocates the application of acquired knowledge.
4.7) Innovative thinking	Open to change, approaches issues differently, offers alternate/out of box solutions and strives for efficiency by working smartly.
4.8) Problem-solving	Understanding a situation by breaking it into small parts, organising information systematically and setting priorities.
4.9) Developing others	Genuinely believes in others' capabilities to develop and take personal responsibility for their development. Creates a positive environment for learning and provides developmental opportunities for individual and team.
4.10) Self-awareness and self-control	Identifies one's own emotional triggers and controls one's emotional responses. Maintains sense of professionalism and emotional restraint when provoked, faced with hostility or working under increased stress. It includes resilience and stamina despite prolonged adversities.
4.11) Communication skills	Articulates information to others in language that is clear, concise, and easy to understand. It also includes the ability to listen and understand unspoken feelings and concerns of others.
4.12) Team-working	Working together as a unit for common goal, building teams through mutual trust, respect and cooperation.

Selection Methodology

Conference Board brings out that 'Companies are in too much of a hurry to make leaders out of managers. It is not easy to find inspirational leaders that can motivate people in all times, both good and bad. What we have most of the time are clinical managers who are good at following mandates and using technology and implementing programs but not at leading people. They are not inspirational. We have seen great managers who are bad leaders' (CB, 2014). It is necessary to put appropriate mechanism to filter leaders from managers.

PSEB is responsible for the selection and placement of personnel in the posts of chairman, managing director or chairman-cum-managing director (Level-I), and functional director (Level-II) in CPSEs as well as in posts at any other level as may be specified by the government. PESB advises the government on matters relating to appointments, confirmation or extension of tenure and termination of services of the personnel of the above mentioned levels. Further, PESB advises the government on the desired structure at the board level, and, for senior management personnel. It also advises the government on a suitable performance appraisal system for both the CPSEs and the managerial personnel in such enterprises.

As per DoPT implementation toolkit, officers who exhibit such competencies, its associated behaviours while performing their duties have a higher chance of producing better results. Once the gap in competencies is assessed, officers can better understand possible reasons for their failure and in determining remedial steps. It says, competency directory will come handy for the appraising agencies, who can pick and choose six to eight relevant competencies based on the context of the organisation and job role played by the officers. Having decided the competencies, it is important to lay down a robust selection process.

Selection Committees : OECD guidelines recommend board to identify the right mix of skills, experience and personal characteristics. The boards could seek expertise from management recruitment agencies (or head-hunters) and/or create a "Directors' pool" based on rigorous qualification criteria. China, Korea, Malaysia, Thailand and Sweden have such practices (OECD, 2018).

Ram Charan in an article 'Why boards fail to choose the right CEO' brings out how IBM selected its CEO. He is of the opinion that there is no generic capabilities of CEO which makes them fit for any unit, rather the unit's requirement to be matched with candidate's

profile. To find a successor to CEO, John Akers in IBM appointed a committee in 1993. The consensus of head-hunters, pundits, security analysts and media was that IBM's new boss needed infotech experience. Some believed IBM especially needed someone who could win the PC war. The selection committee comprising of Murphy and Burke took a radically different view. They laid down a set of non-negotiable criteria : Customer orientation; business acumen – the ability to diagnose what ailed IBM and see how to fix it; and the ability to execute needed change and take the company forward. They did not use generic terms like "vision" or "strategy," and they explicitly did not require infotech experience. The board selected Lou Gerstner, CEO of RJR/Nabisco and previously president of American Express. He was not a techie, but outstanding on each of the three criteria. He famously made clear that IBM did not need a vision and then rescued the company from the verge of breakup, leaving it eight years later as one of the world's most admired and valuable corporations. (Ram Charan, 2012). Ram Charan explains the concept of selection criteria of CEO into five buckets. These criteria can help in making specific, pointed conclusion.

Bucket-1 : The 'givens' – intelligence, character, past record of performance, a methodology for excellent execution,

high energy. Two more are especially important: decisiveness, a bias toward saying 'yes' or 'no' rather than 'may be' and courage.

Bucket-2 : Skills-Specific abilities like the ones Murphy and Burke identified for IBM's CEO. They will vary widely from company to company and era to era. For example, for units facing significant challenges of product obsolescence, skills may include change management, new product positioning and marketing.

Bucket-3 : Relationships- In most companies, much is achieved through a sustained network of external and internal relationships. It does not happen fast. External relationships in particular are built over long periods and become valuable two-way bridges of information. There is a need to examine candidate's record of building enduring relationships at several levels and converting them into strategic advantages.

Bucket-4 : Judgment- Almost all decisions at the CEO level require trade-offs, and many factors are qualitative and subjective. It needs to be examined, how effective is the candidate's judgment on key questions. In addition, there is a need to look how sage have the candidate's judgments been on people, strategic bets, and resource allocation.

Bucket-5 : Perception and cognition-There is a need to examine, if a candidate sees what waits around the bend before others do? Powers of perception and the ability to connect diverse external forces are worth a lot of points. There is a need to find evidence from past experience, about the ability and resilience in the face of shocks.

In light of the above, necessary objective test criteria may be built on the above five buckets to find suitability of the potential recruit for CEO job.

Shareholders' Right to Elect Board Members : The OECD SOE guidelines call for the relevant decision-making and advisory bodies to have a prior consultation with non-government shareholders concerning all board appointments. In listed state-owned enterprises, the enterprises establish external nomination committees attached to their annual general meeting of shareholders, which ultimately has the right to appoint the board. In most cases non-state shareholders should take part to the committee (OECD, 2018).

It is interesting to note that the Banks Board Bureau followed one of the most advanced process of selection for five executive directors of public sector banks for top posts using an assessment centre through a global executive search firm. An assessment centre is defined as "a variety of testing techniques designed to allow candidates to demonstrate, under standardized conditions, the skills and abilities that are most essential for success in a given job". The Bureau sought the assistance of Egon Zehnder, talent strategy and leadership development firm, to conduct such tests through an assessment centre (Bandyopadhyay, 2017).

Steps in Selection Process

While doing empanelment for central posting at the ministry level, the government is already using 360-degree appraisal system—that includes assessing bureaucrats on integrity and reputation, through a comprehensive background check, before their empanelment. This concept can be applied for CEO's selection and their subsequent evaluation. While an executive gets into the senior leadership positions, he/she needs to be assessed for his/her competency and training interventions need to be undertaken for plugging the gaps over a period of one to three years so that he/she can become a better potential candidate for CEO.

The key steps for the selection committee in suggested interview process are :

- The selection committee should decide the list of questions, which focus on the areas of concern.

- The selection committee should meet with the two shortlisted finalist candidates. Each candidate should receive at least thirty minutes to present his or her experience and plans for the organization, followed by forty five to sixty minutes of Q&A. The search consultant should be present only as an observer.

- The selection committee should provide an interview guide to the board outlining the critical competencies from the position specification as well as the key organizational culture attributes and ask each member to rate the candidates in these areas. This will eliminate subjectivity and focus on concrete skills and performance.

- The selection committee should finally agree on a single candidate.

- The selection committee can take assistance from a search firm to get feedback from former superiors, peers and subordinates. References provided by the candidate should not be weighed as heavily as others (Spencer at al, 2008).

Although some organizations evaluate candidates based on personality testing, there is no clear correlation between personality and performance (Guion and Gottier, 1965, Steuer, Abell and Wynn, 2015). Skills that bring out

individual's executive intelligence and ability to succeed in more complex and demanding contexts is more important than past accomplishments. Past research has shown predictive power of these traits on executive performance – and their link to the business performance. Boards should strive to gain an understanding of candidates' analytical capabilities, social intelligence and self-awareness.

The selection must compile and share the following multifaceted information with the entire board; the results from a capabilities-based interview, reflecting past performance; the results from a rigorous assessment of potential and aptitude, predicting future performance; the results from preliminary reference checks and 360-degree conversations about the candidate's leadership style and its impact on the business, providing a current baseline; and cultural assessments, highlighting the difference between the CEO prospect and the current culture of the enterprise, as well as the individual leader's interpersonal style (Steuer, Abell & Wynn, 2015).

Mentoring and Training

No candidate is a perfect fit. The board should identify where the winning candidate falls short and determine how to help him or her close the gap. The directors need to discuss up front

what risks they are taking by choosing that candidate. They should also try to imagine how the candidate might evolve over time. An emerging best practice is to appoint a senior director/ external mentor as a sounding board and coach to help make the new CEO successful, with a highly structured plan for delivering that help in the CEO's first year.

CEOs face unique challenge, being lonely at the top. They must keep raising their game—and having their thinking usefully challenged—for the good of their organizations. They must routinely make decisions concerning matters they have never before tackled. In such high-stakes situations, CEOs need wise mentoring. CEOs need someone who he can share his fears and challenges with; someone whom he has a great rapport with and who will listen to him when he needs the most; and someone he can trust completely, who has no agenda. In high performance organizations, executives accelerate their learning by engaging the services of high-profile veteran leaders from outside their companies through a mentor. Unlike bosses, mentors are not a burden to be shouldered, but a support system that can be relied.

CB brings out "Learning agility is one aspect of leadership that is missing here. Our leaders, especially experienced ones, do not believe they need to invest in themselves. They simply don't believe in continuing education or continuous learning once they reach a certain level. But seriously, would you rely on a surgeon who studied 20 years ago but has never refreshed his skills or updated his practices (CB, 2014)?"

To enhance SOE board professionalism and performance, the OECD SOE guidelines recommend that appointed directors receive a minimum level of training (i.e. induction training), so that SOE board members are well informed of their responsibilities and liabilities. Induction sessions should take place within the first month of an appointment before the first board meeting. It recommends that governments encourage ongoing professional development through technical or specific training (OECD, 2018).

In this regard, Dun & Bradstreet identified best practices of Aditya Birla Finance Limited, which encourages and enables employees to own their learning through an array of structured tools and processes (Dun & Bradstreet, 2017).

- Leadership Talent Development Program : About 25 per cent of the population being part of the Talent Pool.

- Talent Council – The Leadership Board/Governance Body for talent

management decisions, provides opportunities for inter and intra business unit movements in the group.

- Fast Tracker – Being high on performance and potential, 67 per cent of the talent pool has experienced Job enhancements/Job enrichments within the organization.

- Succession Plans – 100 per cent Leadership Bench strength identified for the CXO positions and critical positions across the organization.

Leaders play an important role in developing a culture and mindset of agility among employees. They also promote performance measurement and incentive structures which reward a 'whole of enterprise', 'whole of government' and 'whole of society' view focused on outcomes and impact as opposed to structures, processes and outputs. And because the public sector presents unique conditions and challenges, it is crucial to identify CEO potential candidate, who possess right competencies. Subsequent to the selection of a right CEO candidate, effective public service leadership is promoted by setting high expectations and investing in continuous learning.

Some of the special interventions/practices need to be taken for selection,

posting and management of CEO to reduce the type I error, which are :

- Identifying specific requirement for each organisation for CEO job specification.

- Competency modeling and assessment.

- Selecting of CEO through a structured behavioral interview process.

- Cap on age of CEO at entry to be put at 55.

- Taking assistance of search agencies in evaluating the CEOs through an assessment centre.

- Referral check from stakeholders.

- More emphasis on potential of CEO than mere past performance.

- Induction training, mentoring and orientation and professional development.

The challenge is to identify each public sector specific competencies, considering their unique context, followed by development and nurturing of CEO competencies among present and potential leaders. Leadership selection, succession planning and talent management processes need to be refined so that public sector CEO is chosen and nurtured with perfection.

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Not So Easy for 'Start-ups' to Start in India : Government Policies and Start-up Scenario in Ahmedabad

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India has witnessed the birth, growth and collapse of many start-ups in the past few years. Some have stood against the odds, stride and emerged as home grown unicorns. The Government of India also through its various programs like Start up India, Make in India and Digital India have tried to promote private sector development through entrepreneurial ventures. In the backdrop, the central idea of this study revolves around identifying the hindrances start-ups face in Gujarat with special reference to the city of Ahmedabad. The paper addresses two specific objectives. First, it attempts to recognize the probable issues and challenges faced by start-ups in Ahmedabad; and, secondly, it examines the role State plays in providing assistance to promising entrepreneurs. The study identifies lack of government support, financial constraints, deficiency in appropriate human capital, unsatisfactory ecosystem, minimum interest from the financers and skimpy pricing policy are the major apprehension among the start-ups to mature in the city of Ahmedabad. The new ventures would require the State government to come with an a holistic step through integrating theoretical and policy frameworks. The paper contributes to literature in two distinct ways. First, it provides empirical evidence of the issues and challenges that the start-ups face at the grassroots level; and secondly, it documents how the State can play a role to solve the issue of stagnation in start-up growth.

Introduction

Entrepreneurs are born and not made has been a debate that has raged for decades with no conclusive proven evidence from either side. However, some of the most successful entrepreneurs like Mark Zuckerberg, Steve Jobs, Bill Gates, Jeff Bezos, Larry Page, Serget Brin, and Jan Koum, among others, did not come from entrepreneurial families.

Entrepreneurs are known for having strong desire to control their own destiny (Deakins & Whittam, 2000; Salamzadeh, 2014). This passion is so intense that entrepreneurs will risk their

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family, secured career and future for a better way or an idea that would really change their life. However, there is no 'one-size-fits-all' blueprint to achieve entrepreneurial greatness. In fact, budding entrepreneurs cannot apply "one-size-fits-all" to different sectors of the economy. However, research has found common personality traits among entrepreneur. The most important of these are the determination to succeed, a passion for what they are doing, the ability to learn from their mistakes and take failure on the chin, a long-term vision and a sixth sense that signals an on-coming opportunity. Hence, for every start-up, the crucial phenomenon is risk taking, capabilities to adopt and foresightedness.

Over the last decade, entrepreneurship and new venture formation have been considered as an important propulsion of economic development in India. They have not only received a lot of attention from the scholars of several fields (like, economics of innovation, entrepreneurship and strategic management) but have also included it as a compulsory course in the curriculum of almost all leading business schools across India. Recognizing that the government cannot generate sufficient employment for the country, and the slowing down of private investment, the Government of India under the able leadership of Hon'ble Prime Minister

Shri.Narendra Modi has been big on changing the rhetoric around business and profit. Government started providing support for entrepreneurial initiatives. A series of high-level initiatives, including Start up India, Make in India, Digital India, Pradhan Mantri Mudra Yojana (PMMY) and Mudra Bank, among others have been launched to promote private sector development through entrepreneurial ventures. In fact, in India, November 9th, every year is now celebrated as 'National Entrepreneurship Day'.

Taking a look back towards the Indian business history and legacy, Gujarat (a State in Western India) stands out to be the state of entrepreneurs and businessmen. A land of growth, progress, development and success, Gujarat is called the 'Karmabhumi' or 'land of action' for risk takers and aspiring entrepreneurs. However, despite the globally renowned success of businessmen with Gujarati connect, the state still lags behind many states and metro cities within India in terms of successful start-ups. According to a report by Grant Thornton (2016), National Capital Region (NCR), Bangalore and Mumbai contributed 87 per cent of total investment value and 84 per cent of total investment volume in 2015. Hence, cities like NCR, Bangalore and Mumbai and also Hyderabad and Pune have shown a better prospect than the

top cities of Gujarat (like, Ahmedabad, Gandhinagar, Vadodara, Surat and Rajkot) when it comes to ease in establishing a start-up organisation and subsequently growing into a formidable, full-fledged business. Hence, despite of the tendency of being better risk-analysers and possessing high risk-taking abilities, the start-up scenario within Gujarat is very dismal and not on a constant state of rise.

In the given background, the central idea of this study revolves around identifying the hindrances start-ups face in Gujarat with special reference to the city of Ahmedabad. The paper has two specific objectives to study. First, it attempts to recognize the probable issues and challenges faced by start-ups in Ahmedabad; and, secondly, it examines the role that the state plays in providing assistance to promising entrepreneurs.

Multi-method, multi-case research design were incorporated for collecting field research data. The proprietary nature of the data and the details needed to address the research questions demanded the design of tailored data collection instruments. For each start-up in the sample, information is collected through semi-structured interviews with the founders. Four start-ups are considered for this study. The paper analysed how these start-ups build up their business from four different

perspectives: finance, human resource, environment and support mechanism. Three research questions are addressed. The first one examines the financial issues during the inception and its persistence. The second question cultivates the challenges and bottlenecks faced by the start-ups. The third one looks at how the state effectively supported these entrepreneurial ventures.

This paper contributes to literature in two distinct ways. First, it provides empirical evidence of the issues and challenges that the start-ups face at the grassroots level. These findings from Ahmedabad may be consistent with the Indian scenario. It further probes a common argument put forward to explain the ease doing business in India; in particular, it documents an association between the level of obstacles and the likelihood of failures. These results allow venture capitalists' to have enough understanding of management practices, through which they price their investment and participation. The second contribution documents how the state plays a role to solve the issue of stagnation in start-up growth. In particular, this study also highlights the recent initiatives the State has adopted regarding this issue.

The organization of the article is as follows. Literatures related to start-ups and their issues are reviewed in Section-2.

The entrepreneurial scenario in Gujarat is presented next in Section-3. Section-4 gives an idea how various issues and challenges are faced by the start-ups in Ahmedabad through four case discussions. Further analysis of these cases are discussed in Section-5. Implications of the study for policy-making and research are represented in Section-6, followed by certain concluding comments in Section-7.

Review of Related Literature

Creating a new endeavour would mostly encounter difficulty and failure (Reynolds & Miller, 1992; Van De Ven et al., 1984). Most of the start-ups are unable to sustain themselves and even if they sustain, surviving beyond one to two years is very rare (Patel, 2015). Risk and uncertainty go hand in hand with a new venture. There have been many start-ups that have changed the mechanism and practices of the industry and the customer and emerged with success, however issues like securing finance, expertise knowledge, networking in the venture circle have been common to all the venture. The start-ups also faced problems like increasing labour cost, generating reputation in the dynamic market, issues of raising capital (Storey, 1985; Shepherd et al., 2000; Ebben & Johnson, 2006; Serarols, 2008; Salamzadeh, 2014).

The lack of experience acts as a constraint for the entrepreneurs plunging into the dynamic and ever evolving competitive industry (Schade & Siegel, 2008). In other words, the knowledge and experience required to survive in the industry is found to be limited in case of nascent entrepreneurs. Therefore, the differentiating factor of innovative ideas or assets is missing from the start-ups (Bhide, 2000). However, there are few exceptions too with respect to this subject. Jack Ma and Bill Gates have been exceptions, and massively successful with limited experience and qualification.

This section aims to identify and examine the most common difficulties and challenges encountered by start-ups in the early stages of establishment, irrespective of sector or industry. The review of literature is done based on four typical challenges faced by most of the start-ups: (a) Financial challenges; (b) Human resource challenge; (c) Support mechanism; and, (d) Environmental elements. These challenges are identified from the paper of Salamzadeh and Kesim (2015).

(a) Financial Challenges

The initial step for any business is finance and this has been one of the most prominent challenge for start-ups to raise external finances (Bannock 1981).

Despite the stage that the start-up is at financial issues are mostly encountered by venture for multiple reasons (Colombo & Piva, 2008; Tanha et al., 2011; Salamzadeh, 2015 a, b). For example, whether it is bootstrapping which requires entrepreneurs to source their funds through their family and relatives or at the seed stage where the discussion takes place with the angel investor proposing their expansion plans and valuation. Every stage has its challenge with reference to finance. In order to take advantage of venture capital, preparation of a plan and supporting documents are carried out by the founder, this takes place in the creation stage (Azmat & Samaratunge, 2009).

While seeking external finance, the role of asymmetric information is very crucial for the new venture. This was strongly suggested in the economics of information (Maasoumi, 2007). In theory, when conditions of vagueness combines with asymmetric information (where investors and borrowers have different sets of information), for the funders there are challenges of selection (choosing profitable ventures) and moral dilemma (what will entrepreneurs do with this invested capital) (Deakins & Whittam, 2000). Negative 'knock-on' effect in the start-up process which happens due to lack of funds or inability to raise funds lead to problems with attracting clients and building

alliances, and establishing credibility (Salamzadeh et al., 2015). Banks face this administrative and financial burden which is not regularly witnessed by large established firms. Penalising the start-ups for having inadequate commercial or financial history – an undermining factor to its credibility as a business entity (Bruton & Rubanik, 2002; Ebben & Johnson, 2006).

(b) Human Resource Challenges

Usually a start-up is founded by one founder or few co-founder. But as the venture starts growing they require the right people with specialized knowledge and experience to perform the task. The founder would not be an expert in various functions and processes of the venture and not having the right professionals could act as a major hindrance towards growth and expansion and this human resource management issues could lead to the dissolution of the venture (Salamzadeh, 2015 a, b). Bosma et al. (2002) has presented a detailed study of firms investing in the human and social capital for improving performance. Through their empirical study they suggested that a proper investment in human and social capital increases the entrepreneurs' performance. Again, according to Dwivedi and Singh (2017), nowadays, one of the biggest challenge faced by the start-up companies is to attract best talent

and retain it. They also submit that bad hires by start-ups cost more than just money, they dent morale too. Bad hires do more damage by creating broken and unbroken teams (Ariyo et al. 2015). Hence, before pumping out job descriptions, human resource team has to make sure that it is hiring the right people for the job by creating flexible recruiting frameworks.

(c) Environmental Elements

Issues like the existing trends, limitations in the markets and legal issues are very critical for any venture to bloom and ignoring these trends has led to failure in the case of many start-ups. A number of academic contributions focus on the importance of contextual (environmental) factors and identify a number of possible problems faced by new ventures. Having conducive and supporting environmental facilities is essential for the success of a start-up, the absence of it could disrupt the mere existence of the venture (Boeker, 1988). An organization at every stage needs a supportive environment, but it is argued that a start-up would need one more than an established firm (Bhave, 1994; Bruton & Rubanik, 2002; Van Gelderen et. al., 2005).

Studies conducted by Storey (1985) and Bhide (2000) in the UK and the USA analysed that in the short journey of start-ups they face difficulty in

creating goodwill, which in turn proves to be of immense help during the situation of shortage of demand. Macroeconomic factors like interest rates, inflation and labour costs makes it difficult for the start-ups to survive and sustain. Due to the bubble image of the start-ups, resource providers hesitate supporting the start-ups (Vesper, 1990).

In India for the manufacturing and services sectors the spatial determinants of entrepreneurship was studied by Ghani, Kerr and O'Connell (2013). General traits of quality of physical infrastructure, workforce education, labour laws and household banking access played important role. The first two mentioned that had the most significant impact as a predictor of entry. Whereas at the regional level, local education and physical infrastructure provided evidence to being strong predictors of entry. Discouraging entrepreneurship was related to strict labour regulations and for entry in unorganized market better household banking environment was critical. The role of regional conditions in India for the spatial patterns of entrepreneurship compared to incumbent industry locations is much stronger as compared to the United States.

D) Support Mechanism

Furthermore, few studies tried to combine the impact of management control system and functioning of start-ups.

Managerial challenge were faced by firms expanding beyond informal interaction boundaries Davila and George (2005). During the transition period adaptation of management control system requires the attention of top management and provides the infrastructure to scale up the business model which is very crucial. Positive relation was found between adoption of management control system and start-up firm growth (Ebben & Johnson, 2006; Ritchie & Richardson, 2012).

Similarly, the role of institutional factors like regulations, culture, norms and infrastructure plays a significant role in supporting or inhibiting growth. Countries characterised by efficient markets and effective financial and labour regulations assist firms grow more and faster (Fritsch, 1997; Djankov et. al., 2006). Due to the stringent, costly and time consuming process of registering a new company, the recognition of a business also become a big challenge for the start-ups (Ardagna & Lusardi, 2010). The support of angel investors, hatcheries, incubators, science and technology parks, accelerators, small business development centres, venture capitals, etc., is very critical in the journey of a start-up and availability of such a system leads to the failure of a start-up.

Regions like Silicon Valley and Bangalore are booming while Albany struggles was

not a mere happening. These areas had the right mix of novel ideas, enterprising people, and a culture of risk taking which amalgamated and resulted in creations of transformational business ideas. It would be wrong to say that only an idea could transform the economy of a region. These regions have strong magnets ranging from like premier institutions to restaurants and bars, which pull the youth provide them a platform for intellectual stimulation. This was analysed by Venkataraman (2004).

Considering the Indian perspective, the factors discussed above are also applicable to most of the start-ups irrespective of sector or industry. Additionally, the last few years for a substantial proportion of Indian start-ups have been bumpy because of the deficiency in the support from government, market and blurred vision of the business aspect (Monsen et al. 2012). The entry of accelerators and incubators has played a crucial role in shaping the path for start-ups. In order to match its counterpart in other countries there would be a long way (Jain et al., 2015; Kumar 2015). Many promising entrepreneurs failed to have a realistic business plan along with customer validation. The emergence of the Goods and Services Tax (GST) has also added to the complication of business doing (NASSCOM, 2017). Entrepreneurship needs simple and stable

rules, however, the attempts to increase entrepreneurship have not been helped by some of the recent policies of the State. Sharma (2013) made a study on women entrepreneurs in India. Women entrepreneurs face problems like social barriers, legal aspects, lack of education, family support etc was analysed. She also elucidated various pull and push factors affecting entrepreneurship.

To conclude, it is very unrealistic to avoid the hiccups that start-ups face. Although deliberate efforts to reduce the impact of obvious factors in the real world could be practised, a start-up needs to be agile, flexible and innovative in the entire process.

Entrepreneurial and the Start-up Ecosystem in Gujarat

The State of Gujarat has been a home to many famous industrialists known for their risk appetite and growth. Therefore the State is known as the land of successful entrepreneurs and industrialist who have had the ability and maturity of commercial knowledge (KPMG, 2007). The State also offers an impressive infrastructure with skilled labour at a competitive cost, great road and port connectivity, reliable power supply through traditional and non-traditional sources like wind energy, industrial park, competitive commercial real estate rates in comparison to other states in India and strong public policy support. Gujarat has always been able to attract significantly high levels of investments, including Foreign Direct Investment (FDI) among all the Indian states (Assocham, 2015). This has been a factor for sustaining and accelerating the growth of the State in the past decades.

In order to foster more entrepreneurship and promoting innovation by providing an ecosystem that is conducive for growth of start-ups, the Government of Gujarat has launched several initiatives in line with the national start-up programs in last few years. The 'Start-up Scheme' was announced by the government along with the 'Industrial Policy 2015'. Figure-1 provides the flowchart related to Gujarat Start-up Mission (GSUM) about the scheme.

Few research and academic intuitions are identified as the Nodal Institutions (NIs) by GSUM, industries department, who are responsible for dealing with the start-ups from step one to end. This involves inviting proposals from start-ups, assessing them, providing incubation facility and mentoring facility to grow in the right direction.

In order to evaluate the growth of the ecosystem of Gujarat State, the government has established the Gujarat Start-up Development Society (GSDS). Right

Figure-1: Start-up Ecosystem in Gujarat
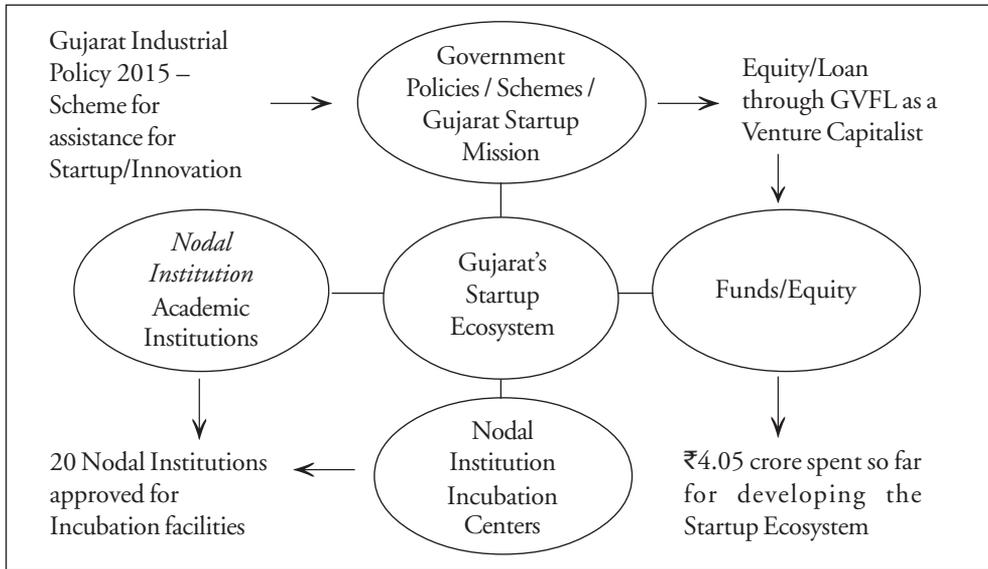
from assisting the start-ups to providing incubators for procuring the funds to self-certifications and fulfilling compliances are the activities carried by GSDC among many others.

Issues and Challenges of Start-ups in Ahmedabad : Case Discussions

Although few notable start-ups like Space Technologies, College Bol, Pegasus, infibeam.com, Travelyaari, Shradhanjali.com, Lendingka, Aura and Jolly Food Fellow are the fall out of the initiatives taken by the Government of Gujarat, however there are several issues and challenges the start-ups are continuously facing in spite of the assurance from the state. In this section, four such start-ups are considered for

discussion. As discussed earlier, face-to-face interviews were conducted with the founders of these four start-ups, namely, Don't Scratch Your Head, Oven Bell, Food Memories and Z Axis Unmanned Machines Pvt. Ltd. A summary of these discussions are presented here through a multi-case based approach.

Case-1 : Don't Scratch Your Head (DSYH)

DSYH is an e-commerce marketplace that resolves logistics reconciliation. It is a SaaS-based (Software as a service based) platform where sellers de-stress themselves from the pain of reconciliation. Generally sellers face a tough time when it comes to reconciling two records – their own and those of the

market. It was founded in November 2015 by three Gen-X entrepreneurs Suraj Vazirani, Sumit Karanji and Harshad Vagdoda with a goal of globalizing their business through a solution to get rid of the termites through reconciliation.

With a bootstrap funding and zero client base, it was always a big challenge for DSYH to establish a client base of more than 500 in less than a year. They started product development with the core offerings of their area of competency i.e. reconciliation. DSYH followed the 'MUSHCO' method which is essentially developing the product and features in ranking of 'Must Have', 'Should Have' and 'Could Have' strategy. This allowed a good balance between scaling up and client servicing in terms of product development with developing support mechanism for clients. Their marketing are predominantly done through remote team viewer demonstrations, bulk emailing and referral mechanism with the core sales strategy to create an inbound sales engine driven by word of mouth, lead generation from affiliates like Amazon India, partnerships and direct agents. DSYH within two years has transformed itself from a 'reconciliation-only' company to an 'e-commerce business management software' company providing opportunities in data visibility, analytics and reconciliation.

DSYH strongly believes that human talent is instrumental in taking the venture forward. They have a very lean human resource (HR) structure and very closely knit team members. The cofounding team itself takes care of the HR and gives direct attention into training and development of their colleagues. They offer attractive compensation structures to their employees and in spite of being a start-up, compensation and rewards model is much better than several established corporate in and around Ahmedabad. DSYH operate in an open working environment with direct access to senior leadership. They have created an open culture where everyone can give feedback to each other on 'what is working' and 'what is not working'. Also, rewarding the right candidate with promotions instantly rather than waiting for completion of a year cycle is imbibed in the culture of the company which helps to constantly engage employees with the organizational goals.

Since DSYH was the pioneer in the technology they built, in a short span of around two years, they are now monthly cash positive and self-sufficient. An angle funding of $250,000 was raised from Venture Catalysts in June 2016.

Although the story looks very attractive and promising, the progress of

DSYH has not been so smooth. Being a start-up from the city of Ahmedabad, DSYH had its own share of challenges. Based on the discussions with the cofounders, it was observed that the biggest challenge which they faced is related to HR. Finding good talents from the city who were ready to join a start-up was initially the main challenge for them. Since the company was in its nascent stage, talented personnel neither from the premium institutes of the state of Gujarat nor from outside the state were ready to take up the assignment although they were innovative and challenging. Hence, recruitment of right candidates for the technical areas was a daunting task. Similarly, acquainting people with the product and channelizing funding avenues was also difficult at the initial stage. Although in several occasions, the Government of Gujarat has been approached by DSYH for incubation, events and mentorship, but no assistance has been provided to them till date.

Case-2 : Oven Bell

Three friends Pratik, Sandeep and Ravi started Oven Bell, a new concept of Home Chef in Ahmedabad, in January 2016. Considering that a majority of Indians are concerned about getting proper food, especially outside food, this innovative concept offers 'Home Cooked' food to discerning, quality conscious individuals from passionate

Home Chefs. They tried to replicate the Home Chef concept which is popular in Mumbai and Gurgaon. They found it feasible and optimal as it does not involve huge cost of kitchen, equipment, other fixed cost, etc. Their portal combined with their systems and processes bring both parties, the home chefs and consumers, together in a seamless way.

Oven Bell started through boot strapped finance with incubation at Gujarat Technical University (GTU) in Ahmedabad. Although this idea of Home Chef was highly appreciated at the forum of Gujarat Start Up Mission and promised with some funding, but due to bureaucratic red tapes and instability of government functioning, it never materialized into reality.

Like any other start-up, Oven Bell also faced several problems like finance, not a ready market, etc., however, their major challenge was related to logistics and delivery timings. Since this is not a typical restaurant like concept where there is a centralised kitchen with availability of ready food items, minimum one and half hours is required to deliver any food as it was prepared only after the order was confirmed. There are very few logistic companies available in Ahmedabad who deliver food items and none could provide guarantee of delivering orders efficiently and most importantly on time. Hence, Oven Bell

had to hire its own delivery boys which in turn incurred an additional cost. Other significant challenges which this start-up faces are narrow spending capacity of customer, availability of cheaper tiffin options, lack of awareness about home chef concept and the mindset of the customers. They also face many challenges in terms of getting appropriately trained people with respect to communication and technical aspect.

Although Oven Bell made extensive use of social media and word of mouth strategy, they found it extremely difficult to at least manage their break even. Hence to cut down the cost, Oven Bell from December 2016 considered shutting down its retail business. At present, they are in tie-up with three companies in Ahmedabad and they take their orders for breakfast and lunch as it requires a much simpler logistics.

Case-3 : Food Memories

Dr.Harmit Singh, a migrant from Punjab, is a doctorate in finance by profession and has substantial work experience in the academic field. However, this educationalist could not resist when he was bitten by the entrepreneurial bug. Being a foodie, it always used to irritate him to depend on others for procuring his favourite food in an uncertain time period. With this craze for good traditional food, Food

Memories was conceived in August 2016. Food Memories is an online platform where food from legendary and iconic vendors from every nook and corner of India is given an online presence to touch the globe.

Since its inception, Food Memories has always believed in being more than just a food delivery service with their innovative and always-on-the-move attitude. At present, this e-commerce brand brings in over 2,400 authentic Indian delicacies from more than 200 vendors across the country and delivers it to over 120 countries. They have done their necessary legwork to ensure that every food item they deliver comes straight from the master's kitchen and is not a cheap, low quality attempt by average vendor.

The initial investment was 6 million rupees (60 lakhs in Indian currency) from three cofounders who themselves are responsible for their verticals of marketing, logistics and finance. The company currently has a team of seven members. The HR is non-existent in the organization and the reporting channels are also fairly direct.

Within a year Food Memories has generated first round of seed funds which helped them in further expansion of their vision. They aggressively market themselves through social media and regularly visit college campuses to

increase awareness among students who come to study from across the nation. They have also tried to incorporate new strategies apart from delivering food products to retail customers. Now Food Memories also provide customised festival hampers during Diwali, Christmas and other festivals to the corporates as well as individual customers.

Like other start-ups, Food Memories had also applied for various government funding but were unsuccessful to receive any. Also, according to the cofounders, Ahmedabad has some challenges associated with it for a start-up to grow. The investors lobby is at a passive stage in this state, and hence, the entrepreneurs are not able to regularly network with them and find the appropriate leads for fund raising. Similarly, identifying the right talent with respect to technical and managerial skills and lack of proper mentoring for the budding start-ups in the city of Ahmedabad acts as a big hindrance and made the path uneasy and volatile for this start-up.

Case-4 : Z Axis Unmanned Machines Pvt. Ltd.

Passion turned into a viable technology-based enterprise is the story of Z Axis Unmanned Machines (in short Z Axis). Flying different multi-rotors and aircrafts, Jugal Pandya and Pankaj Paneria discovered their fascination for unmanned aerial machines. Z Axis is a Gujarat based manufacturer and service provider in the field of Unmanned Aerial Vehicle (UAV). It was founded in August 2015.

The idea was initiated by Pandya and Paneria from their own experience of dealing with Chinese fibre drone which have less pay load capacity and very less flying time. In this backdrop, they started exploring other options for material that have higher durability and longer flying duration. They discovered carbon fibre as a suitable material and initiated research on it. The initial investment was 3 million rupees (30 lakhs in Indian currency) with a bootstrapped model. As they did not have enough funds to have steel mould to manufacture their first product, they took help of a friend who dealt in marble and made their first product out of marble mould. This is how their journey started.

Over the years, the company has designed and developed four different products catering to specific needs of different areas such as defence, fire and disaster management, forest and agriculture, and to cater different service applications such as 3D mapping, LIDAR survey, solar power plant mapping and soil testing, among others. In fact, Z Axis is India's first start-up catering to defence, security and allied sectors and the only start-up from Gujarat selected for 'Make in India Week' in Mumbai in the year 2016. The products

produced by them are 40 per cent cheaper than the imported UAVs from Israel, France and the USA.

The customers for Z Axis in Ahmedabad are : State Tourism Department, Anti-Terrorist Squad (ATS), Ahmedabad Fire and Emergency Services, Indian Space Research Organisation (ISRO) and Border Security Force (BSF) among others for supply of the indigenously built drones. Entering into such a niche market was not an easy task, right from the designing of the product to the manufacturing everything had to be of the highest quality. Their products are made of carbon-fibre, which makes them lightweight and durable. They can be equipped with different payloads depending on customer requirements. In their journey of searching funds, Z Axis identified an angel investor, who contributed in both forms as a mentor and a shareholder.

Z axis works at a capacity of 40 drones per month with a facility set up in Ahmedabad. The company has a team of 10 members consisting of the technical, designing and marketing expertise. Since the team is a small and everyone has an expertise in their own domain, there is no in-house training required. The compensation packages are high as the work is one of a kind.

Since the major market for Z Axis is government and allied agencies, the only way to sell its products is through tender. This works in favour and against the company simultaneously. As this was a new product and comparatively new technology in the market, initially it was difficult to convince government officials about the utility and benefits of the products. Although, the favourable part was that they just had to convince a few government departments, the other departments would follow and repeat the procurement. They purposely did not apply for any government funding as they found the amount to be significantly small and the process is too unwieldy.

Discussions

Subsequent empirical cases in the previous section confirms that embarking on a new business is one of adventure and challenge and is accompanied with factors like high risk and uncertainty. The survey done in the four start-ups for this paper provides an insight into some of the common challenges that they are facing particularly in light of the city of Ahmedabad. They are discussed below in line with the parameters identified in review of literature.

(a) Financial Challenges

All the four start-ups discussed in this paper failed to receive any financial aid from the Government of Gujarat. They found the process to be very lengthy, unclear, highly bureaucratic and less

transparent. The monetary amount associated is also very minimal. Also the trend of bootstrapping is seen in all the ventures studied in order to build faith and credibility of the investor. Entrepreneurs in all four cases were not having any other options but to initiate the venture through their own fund.

(b) Human Resource Challenges

Ventures based out of Ahmedabad face a stiff challenge of recruitment. This is an unique problem for a city like Ahmedabad. Although the start-ups provide an attractive compensation package, decent candidates do not want to explore the risk of joining these places due to instability, uncertainty and lack of start-ups who are at an expansion stage. The people who are willing to join possess ordinary skills in the area of communication, technology and management.

Similarly, an established human resource department is absent in most of the ventures as they follow the principle of ownership. Every cofounder is responsible to train their team and every employee has to take ownership of the task and allied activities, as there are limited number of employees and resources. However, every founder does not possess substantial knowledge of corresponding field and hence it sometimes creates issues in retaining the right talent within the organization.

(c) Environmental Elements

All the start-ups eventually had to change their core strategy to suit in well with the environment. This happened gradually after understanding the dynamics of the markets, customer preferences and feasibility options. Therefore flexibility is ingrained in start-ups.

(d) Support Mechanism

There is a lack of a dynamic ecosystem, mentors, and common platforms for budding entrepreneurs to collaborate and brainstorm. There is scarcity in the support of angel investors, mentors to guide, the right cultural mix, incubators, science and technology parks, accelerators, small business development centres, venture capitals, etc., which causes hindrance towards surviving and development of a start-up.

Implications of the Study

Economists like Schumpeter, Samuelsson and Vanderwerf have made a valuable contribution to the emergence at the macro level, however the process and understanding of entrepreneurial activities at the micro level is still vague. While discussing with the co-founders the process is ingrained with spontaneity and uncertainty. The process of initiating a new venture would be multidimensional.

Few common characteristics of the issues and challenges have emerged

from the survey of four start-ups in Ahmedabad. Support and right ecosystem from the state is extremely critical, however single best approach or solution for start-ups to survive and grow is non-existent. Solely crafting dynamic and vibrant start-up policies may not be very effective until and unless they are implemented well. The states may lack resources and may not be able to support start-ups fully. Therefore, it is important to address core issues and simultaneously generate solution mix.

Since the founders, their ideas are so diverse, it is not viable to follow a generic model which could be applicable to all the start-ups and States. Future research could contribute to specific models in accordance to the sector and states of development. Research in this direction could be beneficial for all, the policy makers, academicians and entrepreneurs. State-sponsored research programs in this area would benefit start-ups from having an evaluation research design as part of the project itself. This would allow for appropriate data to be generated, it will sustain momentum as the implementation steps progress, and it will enable the lessons from success or failure to be carried forward for future schemes. Also, Information and Communications Technology (ICT) capabilities have to be leveraged to push the program forward.

Concluding Remarks

Initiating a new venture is not an expeditious activity. Uncertainty and spontaneity makes the process extremely challenging and dynamic, therefore to pin down an exact theory is difficult (Evers, 2003). Generalization would be impossible for startups who are so diverse in the existence (Gartner, 1985). The process for a new venture creation are accompanied by various issues and challenges which are discussed in the literature. This paper examined and considered the issues and challenges the start-ups face in Ahmedabad. In the light of the survey conducted in four start-ups in Ahmedabad, it was revealed by the cofounders that lack of government support, financial constraints, deficiency in appropriate human capital, unsatisfactory ecosystem, minimum interest from the financers and skimpy pricing policy are the major concern in the city of Ahmedabad. Integrated theoretical frameworks of new venture creation and initiative from the state is very important can be review closely to have a holistic understanding. Also, scholars can take these issues for further research in order to develop a comprehensive theory of start-ups.

However, to conclude in an encouraging and positive note, a recent article in Live Mint (2017) express that traditional business houses are increasingly investing in start-ups to tap into disruption

and gain from emerging technologies. More than a dozen such businesses have made investments totalling $50 million in 11 start-ups in 2017. Happily Unmarried, a consumer products start-up firm recently received funding from Wipro Consumer Care, the personal care arm of Wipro Enterprises in November 2017. Similarly, Bajaj Finance invested $35 million in mobile wallet company Mobikwik in August 2017. Again, Mahindra Partners, a unit of Mahindra and Mahindra Ltd., which invested $2 million in agri-technology start-up Gold Farm along with Infuse Ventures in October 2017. Therefore, despite the loopholes and challenges in existing system, the scenario for start-ups in India is moving forward with positive signals.

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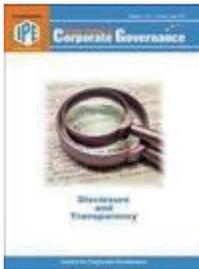
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2	Ethical Hacking, Cyber Security & Cyber Law	May 23-25, 2018	Mr A Rakesh Phanindra
3	Board Orientation Program for Directors	May 30-31, 2018	Prof R K Mishra & Ms J Kiranmai
4	Legal Aspects of People Management	June 21-22, 2018	Dr Deepti Chandra
5	Finance & Risk Management for Non-Finance Executives [for the executives of NMDC Ltd]	June 25-30, 2018	Mr S Satish Kumar & Dr K V Ramesh Kumar
6	Corporate Reforms and Changing Corporate Strategy	June 28-29, 2018	Dr K Trivikram & Dr Shaheen
7	Operations and Supply Chain Analytics for Competitive Advantage	July 2-4, 2018	Mr S Satish Kumar & Dr C V Sunil Kumar
8	Cyber Crime & Safety Measures	July 5-6, 2018	Mr A S Kalyana Kumar
9	Managing Corporate Social Responsibility for High Impact	July 19-20, 2018	Dr Shulagna Sarmar & Ms Pragnya Acharya
10	Ethical Hacking and Cyber Security	Aug 22-24, 2018	Mr A Rakesh Phanindra
11	Enhancing Effectiveness at Workplace	Sept 5-6, 2018	Dr A Sridhar Raj
12	Advanced Leadership Programme	Sept 10-23, 2018	Prof R K Mishra & Mr S Satish Kumar
13	Business Decision Making Using Software Tools (MS Excel, R & Tableau)	Sept 18-20, 2018	Dr Shaheen & Dr C V Sunil Kumar
14	Board Orientation Programme for Directors	Sept 24-25, 2018	Prof R K Mishra & Ms J Kiranmai
15	Rudiments of Business Analytics for Modern-day Decision Making – A Software Based Approach	Sept 25-26, 2018	Dr K V Anantha Kumar
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17	Advanced Leadership Programme for Women Executives	Oct 3-4, 2018	Dr Narendranath Menon, Dr P S Janaki Krishna & Dr P Geeta

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S.No.	Title of Programme	Dates	Programme Director (s)
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19	Enhancing Accountability and Responsiveness in Scientific Organizations [DST Prog]	Oct 15-19, 2018	Dr P Geeta & Dr A Sridhar Raj
20	Strategic Marketing for PSUs	Oct 24-25, 2018	Dr M MKaruna & Dr M L N Rao
21	International Conference on "Operations and Supply Chain Excellence"	Oct 24-25, 2018	Mr S Satish Kumar, Mr S N Mantha & Dr C V Sunil Kumar
22	Financial Models for Sustainable Excellence	Oct 29-30, 2018	Mr M Chandrashekar
23	Project Management for Competitive Advantage	Nov 1-3, 2018	Mr S Satish Kumar & Mr S N Mantha
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25	Management of Technology & Innovation	Nov 5-9, 2018	Dr P S Janaki Krishna
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27	SIPPA Programme	Nov 10-1 Dec, 2018	SIPPA Team & Dr Ch Lakshmi Kumari
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29	GST -Policies, Perspectives and Practices (An Industry-oriented Programme)	Nov 15-16, 2018	Dr K Trivikram, Dr Usha Nori & Dr Sandeep Kumar
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31	Enhancing Sales Performance	Nov 26-27, 2018	Dr V Srikanth & Mr P Mahesh
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S.No.	Title of Programme	Dates	Programme Director (s)
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39	Essentials of Corporate Finance	Dec 27-28, 2018	Dr A Pawan Kumar & Dr Harishankar Vidyarti
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48	Communication for Managerial Effectiveness	Feb 6-8, 20-19	Dr Anand Akundy & Dr N G Satish
49	National Conference on "Data Science, Machine Learning, AI, IoT and Analytics"	Feb 7-8, 2019	Dr Shaheen
50	2nd National Conference on "Marketing in Digital India : Trends, Opportunities & Challenges"	Feb 18-19, 2019	Mr M J Ramakrishna & Mr A RakeshPhanindra
51	10th International Conference on Corporate Governance : Governance & Integrity	Feb 21-22, 2019	Ms J Kiranmai, Ms Swetha Mahrotra & Accounting Research Institute, UTiM
52	National Conference on "Cyber Security"	Mar 6-7, 2019	Mr A S Kalyana Kumar & Mr A Rakesh Phanindra

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